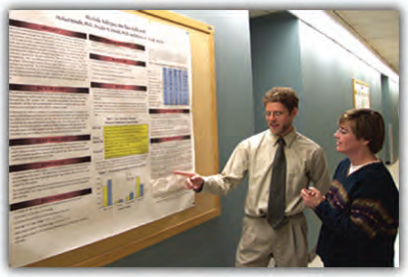
www.uab.edu/graduate












UAB

The University of Alabama at Birmingham

Graduate Catalog 2012-2013

Arts and Sciences

Biomedical Sciences: Interdisciplinary Themes*

*Completion of the training requirements in one of the above interdisciplinary themes provides eligibility for conferral of one of the following PhD degrees:

- Biochemistry and Molecular Genetics
- Cell Biology
- Cellular and Molecular Physiology
- Genetics
- Microbiology
- Neurobiology
- Pathology
- Pharmacology and Toxicology

Business

Dentistry

Arts and Sciences

Anthropology (M.A.*)

You must apply for admissions through The University of Alabama (Tuscaloosa) at www.as.ua.edu/ant/ **www.as.ua.edu/ant/**. In order for a student to enroll in courses at UAB (after applying for admission through UA Tuscaloosa), this process must be followed:

1. Student completes the Cooperative Admission form at http://www.uab.edu/graduate/apply/acrobat/cooperativeadmission.pdf.
2. Student submits the Cooperative Admission form to the University of Alabama's Graduate Registrar, Beth Yarbrough. Ms. Yarbrough's contact information is beth.yarbrough@ua.edu or (205) 348-8285 or (205) 348-5921.
3. The UA Graduate Registrar then faxes a copy of the approved Cooperative Admission form and a copy of the student's UA admission letter to the UAB Graduate Admission Office to the attention of Susan Banks at (205) 996-5852. Mrs. Banks may be contacted at (205) 934-8227 or snoblitt@uab.edu .
4. After UAB receives the approved Cooperative Admission form from UA, the student will be added to UAB's record system and will then be allowed to register for UAB courses online after obtaining a Blazer ID and creating a strong password.

*Degree awarded by the University of Alabama, UAB's partner in the cooperative degree program

Degree Offered:	M.A.*
Director:	*Cormier*
Phone:	(205) 975-6526
E-mail:	lcormier@uab.edu
Web site:	**http://www.uab.edu/history-anthropology/anthropology-graduate-program**

Primary Faculty

Loretta A. Cormier, Associate Professor; Cultural Anthropology, Ecological, Ethnoprimatology, Lowland South America

Sharyn Jones, Assistant Professor; Ethnoarchaeology, Zooarchaeology, Foodways, Polynesia, Fiji, Caribbean

Chris Kyle, Associate Professor; Political Anthropology, Cultural Ecology, Historical Anthropology, Latin America, Mesoamerica

Gregory Mumford, Assistant Professor; Archaeology, Complex Societies, Ancient Trade Networks, Egypt, Eastern Mediterranean

Sarah Parcak, Assistant Professor; Remote Sensing/GIS, Landscape Archaeology, Egyptology, Mediterranean, Egypt

Bruce P. Wheatley, Professor; Physical Anthropology, Primatology, Forensic Anthropology, Indonesia

Affiliated Faculty

Steven Becker, Associate Professor (Environmental Health Sciences); Public Health

Scott Brande, Associate Professor (Geology); Geoarchaeology

Akhlaque Haque, Associate Professor (Government and Public Services); GIS

Millard, Andre, Professor (History); Popular Culture, Documentary Film, History of Technology, US, Europe

Degree Requirements

The M.A. degree program includes the basic course requirements, a foreign language or research skill requirement, and fulfillment of either Plan I (Thesis) or Plan II (Nonthesis).

Basic Course Requirements

Course Work: Each student must complete a minimum of 30 credit hours of courses numbered 500 or above. Without special prior approval of the student's advisor, committee, and the director of graduate studies neither ANTH 691, 692, 693, or 694 (Special Problems Courses) nor ANTH 699 (Thesis Research) will count towards the minimum 30 hours. (Note that there are additional course requirements for two of the three options).

Core Curriculum: All students are required to complete satisfactorily a core curriculum composed of one graduate course in at least three of the four fields of anthropology. These three should be chosen from among: 1) linguistics - ANTH 608 (Advanced Linguistic Anthropology), 2) archaeology - ANTH 609 (Advanced Archaeological Anthropology), 3) socio-cultural anthropology - ANTH 605 (Advanced Cultural Anthropology), and 4) physical anthropology - ANTH 610 (Advanced Physical Anthropology). Additionally, a course in research methodology (e.g., ANT 600 at UA or ANTH 615 at UAB) is required.

Entering students must provide evidence of having passed introductory level courses in each of the four fields before taking the graduate courses. A student who has not had an introductory course may be required to take or audit the appropriate undergraduate course before enrolling in the graduate course. Credits earned from such preparatory course work may not be applied to the 30 credit hour requirement.

Language/Research Skill Competency: Each student is required to demonstrate competency in a foreign language or research skill. This requirement may be satisfied in several ways including:

- successful completion (meaning a grade of B or better) of at least the second course in a language course sequence such as FR 101/102, GN 101/102, or SPA 101/102;
- certification of competency by examination from the appropriate language department;
- successful completion of a graduate level statistics course such as Sociology 701 or another statistics course subject to the approval of the chair and the program director.
- Students must get the approval of their advisor before undertaking any of these options. The student will be responsible for furnishing evidence of completion of this requirement to the director of graduate studies and the department chairman.

M.A. Committee: By the start of the second year of academic work each graduate student will be required to have identified a faculty member willing to serve as permanent advisor and at least three additional faculty members to comprise an M.A. jury. This committee is subject to final approval by the chair and program director and functions as the principal advisory and research project approval board. The committee may include an external member of the Graduate Faculty.

Comprehensive Examinations: All students must take and pass comprehensive examinations on their knowledge of the field of anthropology. The student will take written exams in at least three of the four subdisciplines. The selection of the three areas will be made in collaboration with the faculty advisor. The entire anthropology faculty will participate in composing the exam questions and evaluating each student's responses.

The faculty's evaluations will be communicated to the director of graduate studies and to the chairman of the department.

Interinstitutional Requirement

Students must take at least 6 hours of graduate credit at the University of Alabama (Tuscaloosa) as required by the Interinstitutional MA.

Three Plans of Study for the Master's Degree

In addition to choosing one of the two program options outlined above, the student must satisfy the requirements for one of the following three plans of study. Choice of the plan of study must be made by the student in consultation with the M.A. Committee and the faculty advisor.

Thesis Option: Thirty (30) hours of non-thesis course work, successful completion of the comprehensive examinations, plus a master's thesis. A student electing this plan of study will be required to conceive and execute a research project under the direction of his or her M.A. committee. The student's advisor will convene the committee as necessary to discuss, refine, and approve this plan. After twenty hours of course work are completed, the student may enroll in ANTH 699 (Thesis Research). The purpose of this coursework is to provide a structure for supervised contact hours with the student's faculty advisor. Such coursework, including the decision as to the number of contact hours required, must be pre-arranged in consultation with the faculty advisor. Hours completed in ANTH 699 must be over and above the 30-hour minimum.

In preparing a thesis, the student should consult the booklet, A Manual for Students Preparing Theses and Dissertations available from the Graduate School.

Students who take the thesis option will present a departmental colloquium based on the results of their research in the final semester in residence. Students should consult their faculty advisor and the director of graduate studies in scheduling and posting advance notice of their colloquia.

Non-thesis Research Project Option: Thirty-six (36) hours of non-thesis course work plus successful completion of one of the following:

- Presentation of a research paper at a national meeting which has been approved in advance by the student's M.A. Committee;
- Acceptance for publication of a research paper submitted to a refereed journal which has been approved in advance by the student's M.A. Committee.

In either case, it will be the responsibility of the student's committee to approve a written draft of the research paper. Approval of the paper will be conveyed in writing to the director of graduate studies and to the department chairman by the student's advisor. Final approval of the research project requirement is at the discretion of the M.A. committee.

Students who elect the thesis option will be required to defend their thesis before a departmental committee in the final semester of residence.

Non-thesis Option by Examination: Thirty-six (36) hours of non-thesis course work and successful completion of written examinations.

Additional Information

Deadline for Entry Term(s):	Consult Program Director for information
Deadline for All Application Materials to be in the Graduate School Office:	January 31
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)
Comments	See UA catalog and **www.as.ua.edu/ant**

Contact Information

For detailed information, contact Dr. Loretta Cormier, Graduate Program Director, UAB Department of Anthropology, HHB 360H, 1401 University Blvd, Birmingham, Alabama 35294-1152.

Telephone 205-934-6526

E-mail cconley@uab.edu

Web http://www.uab.edu/history-anthropology/anthropology-graduate-program

Course Descriptions

For courses at the University of Alabama (Tuscaloosa), see the graduate catalog of that university.

Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

Anthropology (ANTH)

601. **Forensic Anthropology**. Applied human osteology, emphasizing ability to identify age, sex, and population type of skeletal material. Effects of disease and behavior on bones. (Wheatley)

602. **The Conquest of Mexico**. Examines the Spanish conquest of Mexico from both Spanish and indigenous perspectives. Surveys the institutionalization of Spanish control over the fallen Aztec Empire and the broader intellectual and material consequences of the conquest. (Kyle)

603. **As Others See Us.** Jointly offered with American Studies and International Studies, this seminar surveys international perceptions of U.S. culture. (Millard)

604. **Introduction to Mapmaking**. Introduction to theory and methods of cartographic representation, image analysis and GIS.

605. **Advanced Cultural Anthropology**. Critical review of theoretical approaches in cultural anthropology. (Taylor, Kyle, Cormier)

608. **Advanced Linguistic Anthropology**. Historical development of theory and field practice of linguistics. (Smith)

609. **Advanced Archaeological Anthropology**. Principal theoretical approaches in 19th- and 20th-century archaeology; historical, processual, and postprocesual. (Jones, Parcak)

610. **Advanced Physical Anthropology**. Human evolution, primatology, race, human genetics. Tasks performed by physical anthropologists. (Wheatley)

611. **Field Archaeology**. Archaeological field and laboratory techniques, including excavation, surveying, and artifact analysis and description; general problems of archaeological interpretation. 1-6 hours.

613. **Human Osteology**. The identification of human skeletal remains. This laboratory/lecture course provides the groundwork for much of the work in physical anthropology. The first course of the sequence into Anth 601. 4 hours (Wheatley)

614. **Geoarchaeology.** Survey of geological methods as applied to archaeological questions. Practicum in geoarchaeological laboratory and analytic methods. (Brande)

615. **Ethnographic Field Methods**. Classroom instruction and practical experience in techniques of ethnographic fieldwork, including participant observation, household surveys, structured and unstructured interviewing, and genealogies. 3-6 hours.

616. **Ethnographic Filmmaking**. The use of film and video to document and analyze aspects of human social and cultural life. Students view, analyze, and create ethnographic films. 3-6 hours.

619. **Food and Culture**. The role of food in human culture through time and in a variety of geographic settings. Examines the biological basis of diet, how foodways develop and change, how and why anthropologists study diet, and variations in foodways around the world. (Jones)

620. **Computers and Statistics in Anthropology**. Computers and statistical applications in anthropology. 1 to 3 hours.

622. **Landscape Archaeology**. Archaeological techniques of reconstructing past landscapes, including remote sensing, GIS, survey, excavation, and environmental analysis. (Parcak)

626. **Archaeology of the Pacific Islands**. Survey of Pacific Islands societies in the past drawing on archaeological, ethnographic, historic, linguistic, and biological data. (Jones)

628. **Comparative Religion**. Human behavior in relation to the supernatural; religion as a system of social behavior and values; theories of religion. (Taylor)

630. **Animal Bone Archaeology**. Introduction to methods and theories of zooarchaeological research. Practical experience in processing, identification, and interpretation of animal bone remains from archaeological sites. 4-6 hours. (Jones)

634. **Observing the Earth from Space**. This course will provide students with an introductory knowledge of remote sensing analysis. Students will learn how to analyze diverse types of satellite imagery in a wide range of fields, and how to apply this knowledge in original research projects. (Parcak)

635. **Ethnomedicine and Ethnopsychiatry**. Approaches and contributions of anthropology to study of health, sickness, and healing. Physical environment and human adaptations as key determinants of health systems; culturally defined concepts of sickness, health, and healing; healing as social, as well as physiological, activity. Topics may include life stages, medical knowledge among different human groups, impact of culture contact on medical systems, ecological balance and population control, cultural definitions and treatment of abnormal behavior, healers, health and supernatural, social roles of sick, and illness and social control. (Taylor)

637. **Real World Remote Sensing**. Real world applications of remote sensing technology. Students work closely with UAB professors and scientists at NASA's Marshall Space Flight Center doing original remote sensing research on diverse topics, possibly including terrorism, global warming, health, anthropology/archaeology, atmospheric studies, urban expansion, and coastal management. (Parcak)

650. **Nationalism, Ethnicity and Violence.** Social and cultural analysis of ethnicity and nationalist ideologies particularly where these have led to violent confrontations within modern nation-states. Considers primordialist versus constructionist theories of difference; the varying weight to be attributed to political, historical and cultural factors in the study of nationalism; and the politics of culture vs. the culture of politics. (Taylor)

653. **Primatology.** Biology, behavior, and distribution of living nonhuman primates with emphasis on field studies of old-world monkeys and apes. (Wheatley)

655. **Archaeology of Alabama**.

657. **Anthropology of Gender**. Cultural construction of gender differences in human societies; shifting definitions of proper male and female roles across cultures and through time. (Cormier, Jones)

660. **Ecological Anthropology**. Examines interactions among behavioral, technological, institutional, and ideological features of human cultures that serve to adapt societies to their environment. (Cormier)

664. **Political Anthropology.** The comparative analysis of political structures and process throughout the world, focusing especially on non-Western forms; a survey of anthropological attempts to understand the complex interplay of culture and power in human societies. (Kyle)

669. **Ethnographic Perspectives on Mexico**. Comparative and historical analysis of rural Mexican communities, emphasizing the impact of recent neoliberal economic policies and democratic political reforms. (Kyle)

681. **Anthropology and the Health Profession**. Anthropological theory and practice relevant to health care professions in medicine, nursing, public health, psychology, etc. Anthropological perspectives on practice of health care and practical applications of anthropology in providing health care to culturally diverse people. (Cormier)

685. **Foundations of Symbolism**. Study of symbolic forms in myth and ritual and overview of theoretical approaches. (Smith)

691. **Special Problems in Cultural Anthropology**. Supervised study of specified topic area; defined problem explored in depth. Topics determined by student and instructor interest in cultural anthropology. 2-6 hours.

692. **Special Problems in Archaeology**. Supervised study of specified topic area; defined problem explored in depth. Topics determined by student and instructor interest in archaeology. 2-6 hours.

693. **Special Problems in Linguistics**. Supervised study of specified topic area; defined problem explored in depth. Topics determined by student and instructor interest in linguistics. 2-6 hours.

694. **Special Problems in Physical Anthropology**. Supervised study of specified topic area; defined problem explored in depth. Topics determined by student and instructor interest in special topics in physical anthropology. 2-6 hours.

699. **Thesis Research**. Independent development of research project. Prerequisite: Admission to candidacy. 1-3 hours.

Art History (M.A.*)

Degree Offered:	M.A.*
Director:	Dr. Heather McPherson
Phone:	(205) 934-4942
E-mail:	**hmcphers@uab.edu**
Web site:	**www.uab.edu/art**

UAB Faculty

Cathleen Cummings, Assistant Professor (Art History); South Asian Art

Jessica Dallow, Associate Professor (Art History); Contemporary Art, American Art, African American Art

Heather McPherson, Professor (Art History); 18th-20th Century European Art

Maria Maurer, Visiting Assistant Professor (Art History), Renaissance and Baroque Art

*A program leading to the Master of Arts degree in art history is offered jointly by UAB and the University of Alabama (Tuscaloosa). The MA degree in Art History prepares students for further academic study at the doctoral level or for professional careers in museums, galleries, and other arts-related fields.

Tuscaloosa Faculty

Amalia Amaki, Professor (Art History); Modern/Contemporary Art

Lucy Curzon, Assistant Professor (Art History); Modern/Contemporary Art

Tanja Jones, Assistant Professor, Renaissance and Baroque Art

Mindy Nancarrow, Professor (Art History); Baroque Art

Catherine Pagani, Professor (Art History); Asian Art

Admission Requirements

Applicants may seek admission to either UAB or the University of Alabama (Tuscaloosa), but admission is upon recommendation of the joint art history faculty of the two institutions. For admission in good standing, applicants to UAB must meet Graduate School requirements for scholarship and GRE General Test scores. A Minimum GPA of 3.0 (B) is required for acceptance into the program. The applicant should have completed 24 semester hours in art history and related areas such as history, aesthetics, archaeology, and anthropology. With the concurrence of the joint faculty, this requirement may be reduced. It is desirable that an applicant be able to read a foreign language related to the proposed field of study. Students may apply for admission for either the fall or spring semester.

Degree Requirements

Courses

Students must complete 24 semester hours in art history.* Students must take courses in **two (as of Fall 2011)** of the following **five** general areas: Renaissance Art, Baroque Art, Nineteenth-Century Art, Twentieth-Century/Contemporary Art & Criticism, and Asian Art. A maximum of 3 semester hours of independent study will be permitted. Each student must take ARH 680 (Literature of Art). Each student must take at least 6 semester hours of coursework at the University of Alabama (Tuscaloosa). *Note: A maximum of 6 of the required hours in art history may be taken in a related field with the concurrence of the joint faculty.

Foreign Language Requirement

Students must demonstrate reading knowledge of French or German by passing a translation examination administered by the Department of Foreign Languages or by passing French 201 or 202 or German 201 or 202 with a grade of B or better. Note: For students specializing in Asian art or other areas, a relevant language may be substituted with the approval of the faculty advisor and the Director of Graduate Studies. This requirement should be satisfied in or before the term in which the student has passed 15 semester hours of coursework. A reading knowledge of a second foreign language is strongly recommended.

Comprehensive Examination

For admission to candidacy, the student must pass a comprehensive examination prepared and graded by the joint art history faculty. Written examinations are scheduled twice a year, fall and spring.

Thesis

The student must present a thesis under the direction of a member of the joint art history faculty. Each student will register for ARH 699 for 6 semester hours of credit.

Additional Information

Deadline for Entry Term(s):	Fall or Spring semester
Deadline for All Application Materials to be in the Graduate School Office:	April 1 for Fall, October 1 for Spring
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)
Additional Requirements	Students must provide a writing sample

Contact Information

For detailed information, contact Dr. Heather McPherson, Graduate Program Director, UAB Department of Art and Art History, Humanities Building, Room 113, 900 13th Street South, Birmingham, AL 35294-1260.

Telephone 205-934-4942; Fax (205) 996-6639

E-mail **hmcphers@uab.edu**

Course Descriptions

For courses at the University of Alabama (Tuscaloosa), see the graduate catalog of that university.

Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

Art History (ARH)

A student may take any seminar twice for credit (see UAB Class Schedule for announcement of subjects). Prerequisite for admission to a seminar is permission of the instructor.

507. **Art of Rome**. Covers Ancient Rome, but focuses on Medieval through early Baroque painting, sculpture, and architecture. Examines the city of Rome over time. Also considers the impact of the papacy on the city and its use of ancient Roman models.

521. **Renaissance Art in Italy: 1300-1480**. Painting, sculpture, and architecture, with an emphasis on the artistic centers of Florence, Venice, Rome and Siena.

522 **Renaissance Art in Italy: 1480-1580**. Painting, sculpture, and architecture, with an emphasis on the artistic centers of Florence, Venice, Rome, and Milan.

523. **Study Abroad: Art in Italy**: On-site study of works of art and architecture in Italy, 1300-1650.

524. **Renaissance Painting in Northern Europe**. Paintings in Holland, Belgium, and Germany, 1350-1550.

530. **Eighteenth-Century Art in Europe** Visual culture in eighteenth-century Britain and France including study of eighteenth-century holdings in the Birmingham Museum of Art. (McPherson)

531. **Northern Baroque Painting**. Painting in Holland and Belgium, 1580-1680.

535. **Southern Baroque Art**. Painting, sculpture, and architecture, with an emphasis on the artistic centers of Rome, Florence, and Venice and painting in Spain, 1580-1680.

540. **Nineteenth-Century Art I: Neoclassicism, Romanticism, and Realism**. Painting, sculpture, and graphic arts in Europe, emphasizing France, 1780-1860. (McPherson)

541. **Nineteenth-Century Art II: Impressionism, Post-Impressionism, and Symbolism.** Painting, sculpture, and graphic arts in Europe, 1860-1900. (McPherson)

550. **American Art to 1900**: Painting, sculpture, and architecture in the U.S., with an emphasis on 19th century. (Dallow)

560. **Twentieth-Century Art to 1945**. Painting, sculpture, and architecture in Europe and the United States, 1900-1945. (McPherson)

561 **Modern Design.** History of modern design. Will examine various design disciplines, design theory, well as the relationships between design, fine art, architecture, and popular culture. (Staff)

564. **Art Since 1945**. Painting, sculpture, and architecture, primarily in the United States, 1945 to the present. (McPherson, Dallow)

565. **Aspects of Contemporary Art**. Topics in Contemporary Art, c. 1970 to the present. Course offerings will vary from year to year and will study a specific historical moment, medium, theme, or subject. (Dallow)

567. **Modern Architecture**. Chiefly twentieth century emphasizing the United States. (Dallow)

568. **Race and Representation**. History of 20th-Century African American art in the context of contemporary theories of identity and in relation to African art. Includes study of objects in the Birmingham Museum of Art.(Dallow)

570. **Art and Culture in China**. An in-depth survey of the art and culture of China from the Neolithic era through the eighteenth century. (Cummings)

571. **Topics in Asian Cinema.** This course offers students an introduction to a vital aspect of contemporary Asian culture, recognizing that film can be an important locus of contemporary cultural commentary and critique. The course presumes no prior knowledge of Asia or cinema and its artistic tradition. The goal of the course is to view and discuss, as a class, approximately ten films, emphasizing an understanding of their cultural background and an appreciation of their aesthetic merits as films and cultural settings in Asia. Attendance at weekly screenings is mandatory. (Cummings)

573. **Japanese Prints and Printmakers**. A history of Japanese wood-block prints and printmakers from seventeenth through twentieth centuries. (Cummings)

574. **Chinese Painting**. Painting and painting theory through the eighteenth century. 3 hours.

575. **Japanese Art**. Art and culture of Neolithic era through the nineteenth century. (Cummings

577. **Art and Architecture of India**. Explores the visual culture of South Asia from the Indus Valley Civilization until the beginning of British rule in India, c. 2500 BCE-1700 CE. (Cummings)

578. **Buddhist Arts of Asia**. Study of Buddhist art and architecture in Asia, with an emphasis on the original context and function of painting, sculpture, and monuments. The specific historical and cultural theme will vary with each course offering. (Cummings)

579. **Art and Culture of Asia**: **Study Abroad:** This course allows students to become immersed in the art and culture of Asia through direct experience in the field. Focus will be primarily on South Asia but may vary with each course offering to include Nepal, Tibet, and Southeast Asia. Preliminary lectures in Birmingham and significant written assignments required (Cummings)

580. **Art Criticism and Theory**. Critical theory and contemporary issues focusing on art from the 1960s to the present. (Dallow)

*582. **Topics in Art History**. Study of thematic topics throughout art history.

585. **Museum Studies**. Museum operation; organization and preparation of exhibitions; cataloging objects in collection; experience with UAB Visual Arts Gallery and Birmingham Museum of Art. (Dallow)

587. **Field Study.** Trips to prominent museums and galleries in the United States or art centers in foreign countries. Preliminary lectures in Birmingham and significant written assignments required.

*590. **Seminar in Art Histry**: May be repeated if focus is different.

592. **Museum Internship**. Through active participation in the daily operations of one or more curatorial departments, students acquire a working knowledge of museums through a program of internships at cooperating institutions. The student will be required to work at the institution a minimum of 12 supervised hours per week during the term. Prior approval of the instructor is required for registration.

620. **Seminar**: Renaissance Art.

630. **Seminar**: Baroque and Rococo Art. (McPherson)

640. **Seminar**: Nineteenth-Century Art. (McPherson, Dallow)

660. **Seminar**: Twentieth-Century/Contemporary Art. (McPherson, Dallow)

670. **Seminar**: Asian Art. (Cummings)

680. **Literature of Art**. Principles and methodology of literature of art as described in writing of founders and chief makers; bibliographical research methods and mastery.

698. **Independent Study**. Prerequisite: Permission of instructor.

*699. **Thesis Research**. Prerequisite: Admission to candidacy. 3 or 6 hours.

Art Studio

Although UAB does not offer a graduate degree in studio art, courses in this area are available to interested graduate students. For additional information, please contact Erin Wright, Chair, UAB Department of Art and Art History, Humanities Building, Room 113, 900 13th Street South, Birmingham, AL 35294-1260 (telephone 205-934-4941).

Faculty

James R. Alexander, Professor (Art); Sculpture, Ceramic Sculpture

Doug Barrett, Assistant Professor (Art); Graphic Design

Douglas Baulos, Assistant Professor (Art); Drawing & Bookmaking

Bert Brouwer, Professor (Art); Painting, Drawing

Gary Chapman, Professor (Art); Painting, Drawing

Derek Cracco, Associate Professor (Art); Printmaking

Christopher Lowther, Assistant Professor (Art); Time-Based Media

John Powers, Assistant Professor (Art); Sculpture

Sonja O. Rieger, Professor (Art); Photography

Erin Wright, Chair/Professor (Art); Graphic Design

ARS 500 Drawing

ARS 506 Digital Filmmaking
ARS 507 Ethnographic Filmmaking
ARS 510 Painting
ARS 520 Sculpture
ARS 522 Sculpture Internship
ARS 530 Ceramic Sculpture
ARS 540 Printmaking
ARS 560 Graphic Design
ARS 561 3D Modeling
ARH 570 Photography
ARH 575 Photography
ARS 579 Studio Internship Photography
ARS 580 Art Exp: Teaching Art N-12
ARS 587 Field Study in Art Studio
ARS 588 Seminar in Time-Based Media
ARS 590 Studio Problems

ARS 592 Studio Internship

ARS 595 Art Studio Seminar

ARS 595 Art Studio Seminar

ARS A1 ARS Major Elective

ARS A2 ARS Major Elective

ARS A3 ARS Major Elective

ARS A4 ARS Major Elective

Biology (Ph.D., M.S.)

Degree Offered:	Ph.D., M.S., 5th Year M.S.
Director:	*Watts*
Phone:	(205) 934-9685
E-mail:	**sawatts@uab.edu**
Web site:	**www.uab.edu/biology/**

Faculty

Charles D. Amsler, Professor (Biology); Ecophysiology and Chemical Interactions

Robert A. Angus, Professor Emeritus (Biology); Aquatic Toxicology

Asim K. Bej, Professor (Biology); Microbial Ecology of Extremophiles, Molecular Genetics

Peggy Biga, Assistant Professor (Biology); Physiology and Developmental Biology

James A. Coker, Assistant Professor (Biology); Biochemistry, genetics/genomics, molecular biology of extremophilic microorganisms

Anne Cusic, Associate Professor (Biology)

Vithal K. Ghanta, Professor (Biology); Tumor Immunology, Aging and Immune System

Roger Gilchrist, Assistant Professor (Biology)

David T. Jenkins, Associate Professor (Biology); Taxonomy, Nomenclature, and Cultural Studies of Basidiomycetes

Ken R. Marion, Professor Emeritus (Biology); Population Dynamics, Reproductive Cycles, Environmental Cues for Reproduction

James B. McClintock, Professor (Biology); Invertebrate Reproduction, Ecology

Karolina M. Mukhtar, Assistant Professor (Biology); Plant-Pathology Interactions, Transcriptional Networks

Dana Peterson, Assistant Professor (Biology); Human Anatomy, Neuroanatomy, Histology and Advanced Microscopy

Sami Raut, Assistant Professor (Biology); General Biology

Nicole C. Riddle, Assistant Professor (Biology); Epigenetics and Chromatin Structure

Robert W. Thacker, Associate Professor (Biology); Community and Behavioral Ecology, Molecular Systematics

Trygve O. Tollefsbol, Professor (Biology); Epigenetics of Cancer, Aging, and Development

Daniel Warner, Assistant Professor (Biology); Ecology and Evolutionary Biology

R. Douglas Watson, Professor (Biology); Endocrinology, Developmental Biology

Stephen A. Watts, Professor (Biology); Nutrition, Model Aquatic Organisms, Ecophysiology, Sustainability

Thane Wibbels, Professor (Biology); Comparative Reproductive Physiology of Vertebrates

Program Information

Areas of Specialization

Graduate students in the M.S. and Ph.D. programs in biology may specialize in research activities at all levels of biological organization, with emphases on ecophysiology, cellular and molecular biology, endocrinology, and ecology of aquatic organisms,or on models related to human disease.

Admission

For admission in good standing, applicants must meet the following requirements, in addition to the Graduate School's standards: an undergraduate degree in a biological science, B-level scholarship in all biology courses, two semesters of organic chemistry, two semesters of physics, mathematics through calculus, and minimum combined verbal and quantitative score of 1150 on the GRE General Test, and a personal statement of career goals. The graduate program director in biology must approve admission on probation or with deficiencies in one of the above requirements. Three letters of evaluation from individuals who have a thorough knowledge of the applicant's academic abilities and potential are also required. Students may enter at the beginning of any semester.

Coursework, Thesis, and Dissertation

A dissertation embodying the results and analysis of an original experimental investigation is required for Ph.D. candidates. Students in the M.S. program may write a thesis based on a research project (Plan I) or, alternatively, may elect to submit a nonresearch project incorporating a review and analysis of one or more topics of current or historical interest in biology (Plan II).

Since scientific problems encountered today are multifaceted and require multidisciplinary approaches, students are expected to acquire a broad background in the physical and life sciences. Doctoral students must complete formal course work in or have equivalent training related to six of the following seven areas: ecology, physiology, cell biology, developmental biology, genetics, microbiology, and molecular biology. Master's students must have competency in five of these life-science areas. Each student is also expected to satisfactorily complete a course or sequence in biometry and any advanced courses designated by the student's graduate study committee consistent with the chosen area of specialization. Each student must also enroll in three seminar courses approved by his or her graduate study committee, and one of the seminars must be outside the student's primary area of specialization. Also, each student is required to demonstrate proficiency in teaching by delivering formal course lectures or by conducting instructional laboratories.

Examinations

To qualify for candidacy, a student in the Plan I master's program must satisfactorily complete either a written or an oral comprehensive examination. A doctoral student must take both written and oral comprehensive examinations. As part of a student's final defense of his or her dissertation or thesis, a public departmental seminar must be presented.

Class A Teaching Certification

Under the Alabama Department of Education's "Strengthened Subject Matter Option," students who complete requirements for the master's degree in biology can also receive class A teaching certification,

providing that certain prerequisites and requirements are met. Complete details are available from the School of Education Certification Office, EB 100, 1530 3rd Avenue South, Birmingham, Alabama 35294-1250 (Telephone 205-934-5423).

Additional Information & Mailing Address

Deadline for Entry Term(s):	Each semester
Deadline for All Application Materials to be in the Graduate School Office:	Eight weeks before semester begins
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)

Contact Information

For detailed information contact Dr. Stephen A. Watts, Graduate Program Director, UAB Department of Biology, CH 375, 1530 3rd Avenue South, Birmingham, Alabama 35294-1170.

Telephone 205-934-9685

Fax 205.975.6097

E-mail **sawatts@uab.edu**

Web **www.uab.edu/uabbio**

Physical Address

UAB Department of Biology, Campbell Hall, Room 464, 1300 University Blvd., Birmingham, Alabama 35294-1170

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

Biology (BY)

501. **Genetics for Teachers.** Basic genetic principles; recent research developments. Prerequisite: Permission of instructor.

502. **Botany for Teachers**. Provides understanding of human structural and functional relationships essential in modern biology. Corequisite: BY 503.

503. **Botany Lab For Teachers**. Laboratory supplementing lecture (BY 502) through use of human specimens, models, and demonstrations.

504. **Life Sci for Mid Schl Teachers**.

507. **Microbial Ecology**. Microorganisms in nature; interactions with each other and with environment. Independent project required. Prerequisite: BY 271.

511. **Molecular Genetics**. Prokaryotic and eukaryotic gene structure and function. Prerequisites: BY 271 and 330, and CH 232. Independent project required.

520. **General Endocrinology**. Roles of endocrine and neuroendocrine chemical messengers in the control of cellular and physiological processes. Term paper required. Prerequisite: BY 256 or permission of instructor.

531. **Advanced Recombinant DNA Technology**. Manipulation of genes and their regulations, and techniques used in recombinant DNA technology. Independent project required. Prerequisites: BY 311 and 330, and CH 233 and 461. Lectures and laboratories.

535. **Natural History of the Vertebrates**. Adaptations of vertebrates for survival in particular environments. Survey and classification of local vertebrates. Two lectures, one laboratory or field trip per week. Independent project required. 4 hours.

535L. **Natural History Vertebrate Lab**. Lab must be taken with BY 535 lecture.

540. **Biology and Aging**. Current understanding of aging, measuring aging changes, theories of aging and aging changes in various human systems. Prerequisite: BY 103 or permission of instructor.

552. **Field Botany**. Principles and techniques of plant identification and classification; consideration of phylogenetic systems. Lecture and field trips. Independent project required. 4 hours.

552L. **Field Botany Lab**. Lab must be taken with BY 552 lecture.

555. **Principles of Scientific Investigation**. Methods of scientific process, experimental design, data interpretation and presentation, and scientific writing.

560. **Advanced Invertebrate Zoology**. Selected topics. Lecture and student projects. Prerequisite: BY 255 or permission of instructor.

565. **Limnology**. Biology of freshwater and estuarine organisms. Lecture, laboratory, and field trips. Prerequisites: BY 104 and 370 or permission of instructor. 4 hours.

565L. **Limnology Lab**. Lab must be taken with BY 565 lecture.

567. **Tropical Ecology**. An overview of the major tropical ecotypes with emphasis on ecology of terrestrial, aquatic, and marine tropical organisms. Prerequisite: BY 255 or 370 or permission of instructor. Major portion of course taught at a tropical field station in the Caribbean. Lectures, laboratory, and field trips. Library research paper required.

568. **Galapagos Ecology**. An overview of the ecology of the Galapagos Island, with an emphasis on the ecology of terrestrial and marine organisms. Major portion of course conducted on the Galapagos Islands. Lecture and field trips (May session, alternate years). *Prerequisite:* BY 124 and Permission of Instructor.

569. **Rain Forest Ecology**. Overview of physical and environmental factors that structure the rainforest, biodiversity of life, and interactions of its organisms. A survey of prominent biota will be conducted. Prerequisites: BY 255 or 256 or 370 and permission of instructor. Major portion of course taught in Costa Rica. Lectures and field trips. Library research paper required.

570. **Ecology**. Ecosystems and population biology. Lectures, laboratories, and field trips. Independent project required. Prerequisite: BY 255 or 256.

571. **Ecology Lab**. Preq is BY 570 or concurrent enrollment. Field trips. 1 hour.

573. **Biochemical Adaptations to Environment**. Examination of physiological and biochemical adaptations of organisms to physical environment. Prerequisites: BY 309 and 330 and CH 460, or permission of instructor.

585. **Northern Field Studies**. Ecology of northern coniferous forest and tundra ecosystems. Major portion of course taught on site in Alaska. Lecture and field trips. Graduate project/paper required. 3 hours. (Irregular offering)

*595. **Special Topics in Biology I**. Lecture, laboratory, or both. 1-4 hours.

*596. **Special Topics in Biology II**. Lecture, laboratory, or both. 1-4 hours.

597. **Investigative Techniques**.

598. **Non-Thesis Research**.

605. **Microbial Physiology**. Microbial structure and function, growth, metabolism, and regulation of cellular activity. Independent project required. Prerequisites: BY 271 and 3 semester hours of organic chemistry.

607. **Microbial Ecology**. Microorganisms in nature; interactions with each other and with the environment. Independent project required. Prerequisite: BY 271.

610. **Comparative Animal Physiology**. Comparative examples to illustrate general principles of physiology; study of how animals function in their environment. Term paper required. Prerequisite: BY 256 or permission of instructor.

611. **Advanced Human Anatomy.** This course will provide students with an interest in medical and health sciences a detailed examination of human anatomy. Laboratory sessions will be devoted to focused observation of prosected cadavers and small student-team dissection of entire cadavers. *Prerequisite:* BY 115 or permission of the instructor.

615. **Eco-Epidm. of Arthrpd Brn Dis**. This course covers the ecology, epidemiology, & control of arthropods and the pathogens they transmit to humans and animals. Special emphasis will be placed on emerging and re-emerging pathogens such as: dengue, yellow fever, bartonella, Rift Valley fever, typhus, & Chagas disease. The laboratory will reinforce the lectures with hands-on identification of both arthropods and pathogens. Lecture and Lab. Independent Project required. 3 hours

615L. **Eclogy & EPI Arthrop Lab**

616. **Cellular Physiology**. Structure and function of cells and their components at the molecular level. Laboratory experience using modern equipment and biochemical methods. Independent project required. Prerequisites: BY 309 or 330 and CH 232. 4 hours.

619. **Reproductive Physiology**. Comparative reproductive physiology in animals with emphasis on mammals. Independent project required. Prerequisites: BY 256 and 3 semester hours of organic chemistry.

626. **Evolutionary Medicine**.An evolutionary approach to issues relating to human health and disease. *Prerequisites:* (BY 116 or BY 409) and BY 330 or permission of instructor.

628. **Biology Laboratory Teaching Techniques**. Student will assist in instruction of an introductory biology laboratory. Responsibilities will also include preparation of quizzes and practicals and designing and conducting an instructional laboratory exercise. Prerequisites: Permission of instructor.

629. **Evolution.** Introduction to the study of evolutionary processes *Prerequisites:* BY 210.

632. **Biological Info Resources**. The National Center for Biological Information (NCBI) website is a treasure house of information and tools for researchers in all areas of modern Biology. The goal of this course is to provide guidance for students who wish to become familiar with the NCBI website through an online learning experience. They will learn many of the features available at this site and will gain experience using some of the tools. The course will be taught completely online and will consist of 1) Guidelines for navigating through NCBI, 2) Study guide questions for students to answer online, 3) NCBI tutorials with questions to be answered online, 4) Assignments with questions to be answered online, 5) Online exams. Graduate levels require a graduate project.

633. **Advanced Molecular Genetics**. Examination of the molecular genetics of eukaryotic organisms, including genomes, nucleosomes, chromosomes, transcription, splicing, transposition and signal transduction. The role of molecular biology in immune diversity and cell growth will also be studied. Prerequisites: BY 311 and 431.

634. **Function Genomics Sys Bio**. Systems biology is an inter-disciplinary study underlying complex biological processes as integrated systems of many interacting components. This course will give students a foundation in understanding complex biological interactions at the molecular, network and genomic level. This course will cover state-of-the-art high throughput established and novel approaches used in genome sequencing, transcriptomics, proteomics and metabolomics to obtain, integrate and analyze complex data. The students will also get familiar with knowledge on experimental perturbation of genomes, gene regulatory networks, comparative genomics and evolution, basic bioinformatics. This course will be a combination of text based lectures and discussions of the current literature relevant to Functional Genomics and Systems Biology. Prerequisite: BY210 minimum grade of C.

640. **Immunology**. Immune system and functions of host humoral and cellular immune responses. Mechanisms of antigen and antibody reactions and basic immunological methods. Independent project required. Prerequisites: BY 271, BY 330, and CH 231.

642. **Experimental Phycology**. Introduction to algae. Experimental approaches to productivity. Algae as model systems. Independent project required. Prerequisites: BY 124 and either BY 330, BY 450, and CH 462, or permission of instructor. Lecture and laboratory. 4 hours.

642L. **Experimental Phycology Lab**. Lab must be taken concurrently with BY 642 lecture.

646. **Techniques in Biological Research I**. Concepts and practical application of techniques pertinent to biological research. Prerequisites: Permission of instructor. Lecture and laboratory.

648. **Psychoneuroimmunology**. Explores communication between neuroendocrine and immune systems. Prerequisite: Permission of instructor. 3 hours

652. **Field Botany for Teachers**. Principles and techniques of plant identification and classification; consideration of phylogenetic systems. Lectures and field trips. Independent project required. Prerequisite: BY 260 or permission of instructor. 4 hours.

652L. **Field Botany Lab**. Lab must be taken with BY 652 lecture.

653. **Mycology**. Fungi, including morphology, development, physiology, taxonomy, and phylogeny. Independent project required. Prerequisites: BY 260 or 271 and 3 semester hours of organic chemistry. Lecture and laboratory. Offered at irregular intervals. 4 hours.

653L. **Mycology Lab**.

655. **Biometry**. Methods of data summary, presentation and analysis and the use of computer statistical applications. Lectures and computer laboratories.

662. **Introductory Neurobiology**. Introduction to biological basis of nervous system function. Comparative approach applying molecular, cellular, and systems' concepts to nervous system function is used to examine electrical and chemical signaling, neural circuitry, and cellular basis of behavior and neural development. Independent project required. Prerequisites: BY 309, CH 231, and PH 101.

665. **Limnology**. Introduction to ecology of inland waters and estuaries. Lectures and field trips. Prerequisite: BY 255 or 256. 4 hours.

665L. **Limnology Lab**. Lab must be taken concurrently with BY 665 lecture.

667. **Population Ecology**. Structure and dynamics of populations with an emphasis on understanding how reproduction, mortality and dispersal interact to control fluctuations in population size and structure. Quantitative Literacy is a significant component of this course (QEP). *Prerequisites*: BY 124. 669.

Molecular Ecology and Phylogenetics. Course will survey processes and patterns of molecular evolution and methods of phylogenetic analysis using DNA sequences, amino acid sequences, and molecular markers. *Prerequisites:* BY 124 and BY 210, or permission of instructor.

669. **Molecular Ecol & Phylogenetics**. Course surveys processes and patterns of molecular evolution and methods of phylogenetic analysis of DNA sequences, amino acid sequences, and other molecular markers. Additionally, a project/paper will be required. Graduate level; 3 hours credit.

671. **Biochemical Adaptations to Environment**. Examination of physiological and biochemical adaptations of organisms to physical environment. Prerequisites: BY 309 and 330 and CH 460, or permission of instructor.

674. **Chemical Ecology**. Chemical interactions between organism and chemical sensing of the environment, including chemical defenses against threats and chemical communication between individuals. *Prerequisites*: BY 124 and CH 235 or permission of instructor.

673. **Biochem Adapt to Environment**.

675. **Mammalian Embryology**. Examination of control mechanisms of embryonic development at molecular level and differentiation from fertilization through gestation. Mechanisms of abnormal embryonic development. Prerequisite: BY 314.

*681. **Seminar in Physiological Ecology**. Current research. 1 hour.

*682. **Seminar in Immunology**. Current research. 1 hour.

*683. **Seminar in Physiology**. Current research. 1 hour.

*684. **Seminar in Microbial Ecology**. Current research. 1 hour.

*685. **Seminar in Cell Biology**. Current research. 1 hour.

*686. **Seminar in Mammalian Development**. Current research. 1 hour.

*687. **Seminar in Endocrinology**. Current research. 1 hour.

*688. **Seminar in Algal Ecophysiology**. Current research in specific areas. 1 hour.

*689. **Seminar in Genetics**. Current research. 1 hour.

*690. **Seminar in Cellular Physiology**. Current research in specific areas. 1 hour.

*691. **Seminar in Botany**. Current research developments. 1 hour.

*692. **Seminar in Ecology**. Current research. 1 hour.

*693. **Seminar in Embryology**. Current research. 1 hour.

*694. **Seminar in Microbiology**. Current research in microbial ecology and microbial physiology. 1 hour.

*695. **Special Topics in Biology I**. Lecture, laboratory, or both. 1-4 hours.

*696. **Special Topics in Biology II**. Lecture, laboratory, or both. 1-4 hours.

*697. **Investigative Techniques**. Application of modern experimental techniques in solving research problems. 1-2 hours.

*698. **Nonthesis Research**. 1-12 hours.

*699. **Thesis Research**. Prerequisite: Admission to candidacy. Pass/Fail. 1-10 hours.

732. **Biological Info Resources**. The National Center for Biological Information (NCBI) website is a treasure house of information and tools for researchers in all areas of modern Biology. The goal of this course is to provide guidance for students who wish to become familiar with the NCBI website through an online learning experience. They will learn many of the features available at this site and will gain experience using some of the tools. The course will be taught completely online and will consist of 1) Guidelines for navigating through NCBI, 2) Study guide questions for students to answer online, 3) NCBI tutorials with questions to be answered online, 4) Assignments with questions to be answered online, 5) Online exams. Graduate levels require a graduate project.

734. **Function Genomics Sys Bio.** Systems biology is an inter-disciplinary study underlying complex biological processes as integrated systems of many interacting components. This course will give students a foundation in understanding complex biological interactions at the molecular, network and genomic level. This course will cover state-of-the-art high throughput established and novel approaches used in genome sequencing, transcriptomics, proteomics and metabolomics to obtain, integrate and analyze complex data. The students will also get familiar with knowledge on experimental perturbation of genomes, gene regulatory networks, comparative genomics and evolution, basic bioinformatics. This course will be a combination of text based lectures and discussions of the current literature relevant to Functional Genomics and Systems Biology. Prerequisite: BY210 minimum grade of C.

746. **Techniques in Biological Research I**. Concepts and practical application of techniques pertinent to biological research. Prerequisites: Permission of instructor. Lecture and laboratory.

755. **Biometry**. Methods of data summary, presentation and analysis and the use of computer statistical applications. Lectures and computer laboratories.

763. **Electron Microscopy**.

763L. **Electron Microscopy Lab**.

767. **Population Ecology**. Structure and dynamics of populations with an emphasis on understanding how reproduction, mortality and dispersal interact to control fluctuations in population size and structure. Quantitative Literacy is a significant component of this course (QEP). *Prerequisites*: BY 124.

769. **Molecular Ecology and Phylogenetics**. Course will survey processes and patterns of molecular evolution and methods of phylogenetic analysis using DNA sequences, amino acid sequences, and molecular markers. *Prerequisites:* BY 124 and BY 210, or permission of instructor.

773. **Biochemical Adaptations to Environment**. Examination of physiological and biochemical adaptations of organisms to physical environment. Independent project required. Prerequisites: BY 309 and 330, and CH 461, or permission of instructor.

*781. **Seminar in Physiological Ecology**. Current research. 1 hour.

*782. **Seminar in Immunology**. Current research. 1 hour.

*783. **Seminar in Physiology**. Current research. 1 hour.

*784. **Seminar in Microbial Ecology**. Current research. 1 hour.

*785. **Seminar in Cell Biology**. Current research. 1 hour.

*786. **Seminar in Mammalian Development**. Current research. 1 hour.

*787. **Seminar in Endocrinology**. Current research. 1 hour.

*788. **Seminar in Algal Ecophysiology**. Current research in specific areas. 1 hour.

*789. **Seminar in Genetics**. Current research. 1hour.

*790. **Seminar in Cellular Physiology**. Current research in specific areas. 1 hour.

*791. **Seminar in Botany**. Current research developments. 1 hour.

*792. **Seminar in Ecology**. Current research. 1 hour.

*793. **Seminar in Embryology**. Current research. 1 hour.

*794. **Seminar in Microbiology**. Current research in microbial ecology and microbial physiology. 1 hour.

*795. **Special Topics in Biology I**. Lecture, laboratory, or both. 1-2 hours.

*796. **Special Topics in Biology II**. Lecture, Laboratory, or both. 1-2 hours.

*797. **Investigative Techniques**. Application of modern experimental techniques in solving research problems. 1-2 hours.

*798. **Nondissertation Research**. 1-10 hours.

*799. **Dissertation Research**. Prerequisite: Admission to candidacy. Pass/Fail. 1-10 hours.

Marine Science (MESC)

In addition to the course offerings listed below, certain courses given through the Marine Environmental Sciences Consortium at Dauphin Island, Alabama, may be taken for graduate credit. For detailed information, contact Dr. Ken R. Marion, Department of Biology, Campbell Hall, Room 173, 1300 University Boulevard, Birmingham, Alabama 35294-1170.

Telephone 205-934-3582

E-mail **kmarion@uab.edu**

611. **Marsh Ecology**. Habitat analysis, natural history studies, and population dynamics of selected marsh organisms. Lecture, laboratory, and fieldwork. 4 hours.

612. **Marine Ecology**. Bioenergetics, community structure, population dynamics, predation, completion, and speciation in marine ecosystems. Lecture, laboratory, and fieldwork. 4 hours.

614. **Advanced Marine Ecology**. Mechanisms controlling the distribution of marine organisms. Major concepts in marine ecological theory. 2 hours.

615. **Coastal Ornithology**. Coastal and pelagic birds, with emphasis on ecology, taxonomy, and distribution. Lecture, laboratory and field trips. 4 hours.

618. **Benthic Ecology**. Factors controlling life cycles of marine benthic organisms and organization of their communities. 2 hours.

619. **Marine Microbial Ecology**. Survey of the types of microorganisms found in the marine environment and their interactions with each other and their environment. Lecture and laboratory.

620. **Coastal Ecosystems Dynamics**. Investigation of the structure and function of a variety of coastal ecosystems and evaluation of energy and nutrient processing in disparate ecosystems. 2 hours.

621. **Marine Plankton**. Taxonomy and biology of marine phytoplankton, bacterioplankton and zooplankton. Lecture and laboratory.

622. **Chemical Oceanography**. An in-depth examination of the chemistry of seawater and its relationship with biological, geological and physical processes in the oceans.

623. **Geological Oceanography**. Historic and current consequences of both geophysical and classic geological processes as they relate to the marine environment. Tectonic theory, sedimentary processes, stratigraphy, micropaleontology, erosion, and the formation of hydrocarbons. Lecture and laboratory.

625. **Physical Oceanography**. Physical properties of the world's oceans. Waves, tides, circulations, fluctuations, and interactions of the sea with the atmosphere and landmasses.

626. **Biological Oceanography**. Chemical, physical, and geological patterns and processes important in the interaction of organisms and the sea.

627. **Fisheries Oceanography**. Examination of the relationships between fish life history, recruitment dynamics and harvest potential, and local-, meso-, and global-scale oceanography processes. 2 hours.

629. **Fisheries Techniques**. Current biological and technological methodologies for studying fishes and aquatic habitats, with emphasis on study design and integration across subdisciplines.

630. **Marine Biogeochemical Processes**. Understanding how biogeochemical processes regulate ecosystem function in the marine environment. 2 hours.

631. **Sediment Biogeochemistry**. Sediment biogeochemical processes and their effects on nutrient cycles, plant production, and animal distribution. Lecture and laboratory.

632. **Ocean Variability and Global Change**. Examination of large-scale, spatial and temporal variability in the earth/ocean system. 2 hours.

633. **Marine Biogeography and Paleobiology**. Overview of the time course of evolutionary changes in marine ecosystems and the role of historical factors influencing the distribution of marine organisms. Lecture and field trip.

634. **Marine Resource Management**. Management of marine resources, development of legislation, and impacts of management on human resources. 2 hours.

635. **Marine Analytical Instrumentation**. Overview of the major analytical tools available to marine scientists. Lecture and laboratory.

636. **Oceanographic Experiences**. Participation in an oceanographic research cruise. Research project report. 1-3 hours.

670. **Field Marine Science**. Two-week field exercise at selected sites along the Gulf of Mexico and Atlantic shoreline of North America. Pretrip lectures and readings. 2 hours.

692. **Seagrass Ecosystem Ecology**. Ecology of seagrass systems of estuarine environments. 2 hours.

693. **Seminar in Marine Science**. Current research. 1 hour.

694. **Directed Studies on Marine Topics**. Research on marine topics. 1-6 hours.

696. **Special Topics in Marine Science**. Lecture, laboratory, or both. 1-6 hours.

714. **Advanced Marine Ecology**. Mechanisms controlling the distribution of marine organisms. Major concepts in marine ecological theory. 2 hours.

718. **Benthic Ecology**. Factors controlling life cycles of marine benthic organisms and organization of their communities. 2 hours.

719. **Marine Microbial Ecology**. Summary of the types of micro-organisms found in the marine environment and their interactions with each other and their environment. Lecture and laboratory.

720. **Coastal Ecosystems Dynamics**. Investigation of the structure and function of a variety of coastal ecosystems and evaluation of energy and nutrient processing in disparate ecosystems. 2 hours.

721. **Marine Plankton**. Taxonomy and biology of marine phytoplankton, bacterioplankton and zooplankton. Lecture and laboratory.

722. **Chemical Oceanography**. An in-depth examination of the chemistry of seawater and its relationship with biological, geological and physical processes in the oceans.

723. **Geological Oceanography**. Historic and current consequences of both geophysical and classic geological processes as they relate to the marine environment. Tectonic theory, sedimentary processes, stratigraphy, micropaleontology, erosion, and the formation of hydrocarbons. Lecture and laboratory.

725. **Physical Oceanography**. Physical properties of the world's oceans. Waves, tides, circulations, fluctuations and interactions of the sea with the atmosphere and landmasses.

726. **Biological Oceanography**. Chemical, physical and geological patterns and processes important in the interaction of orga.isms and the sea.

727. **Fisheries Oceanography**. Examination of the relationships between fish life history, recruitment dynamics and harvest potential and local-, meso-, and global-scale oceanographic processes. 2 hours.

729. **Fisheries Techniques**. Current biological and technological methodologies for studying fishes and aquatic habitats, with emphasis on study design and integration across sub-disciplines.

730. **Marine Biogeochemical Processes**. Understanding how biogeochemical processes regulate ecosystem function in the marine environment. 2 hours.

731. **Sediment Biogeochemistry**. Sediment biogeochemical processes and their effects on nutrient cycles, plant production and animal distribution. Lecture and laboratory.

732. **Ocean Variability and Global Change**. Examination of large-scale, spatial and temporal variabiltiy in the earth/ocean system. 2 hours.

733. **Marine Biogeography and Paleobiology**. Overview of the time course of evolutionary changes in marine ecosystems and the role of historical factors influencing the distribution of marine organisms. Lecture and field trip.

734. **Marine Resource Management**. Management of marine resources, development of legislation, and impacts of management on human resources. 2 hours.

735. **Marine Analytical Instrumentation**. Overview of the major analytical tools available to marine scientists. Lecture and laboratory.

736. **Oceanographic Experiences**. Participation in an oceanographic research cruise. Research project report. 1-3 hours.

738. **Marine Zoogeography**.

739. **Oceanology of Gulf of Mexico**.

741. **Benthic Community Structure**.

743. **Plankton**.

750. **Marine Plant/Animal Interact.** Marine Plant and Animal Interactions.

760. **Marine Geophysical Processes**.

765. **Estuarine Biology**.

770. **Field Marine Science**. Two-week field exercise at selected sites along the Gulf of Mexico and Atlantic shorelines of North America. Pre-trip lectures and readings. 2 hours.

780. **Marine Paleoecology**.

792. **Seagrass Ecosystem Ecology**. Ecology of seagrass systems of estuarine environments. 2 hours.

793. **Seminar in Marine Science**. Current research. 1 hour.

794. **Directed Studies on Marine Topics**. Research on marine topics. 1-6 hours.

795. **Phytoplankton Eco/Physiology**.

796. **Special Topics in Marine Science**. Lecture, laboratory, or both. 1-6 hours

Chemistry (Ph.D., M.S)

Degree Offered:	Ph.D., M.S.
Director:	*David E. Graves*
Phone:	(205) 934-5381
Fax:	(205) 934-2543
E-mail:	dgraves@uab.edu

Web site:	www.chem.uab.edu

Faculty

Venkatram R. Atigadda, Research Assistant Professor (Chemistry); Organic Chemistry, Synthesis, drug design and synthesis, anticonvulsant drug development, antidiabetic and cardiac drug development, drugs for treating or preventing cancer, drugs for influenza.

Christie G. Brouillette, Research Professor (Chemistry); Biophysical Chemistry, protein structural cooperativity and energetics through the application of biophysical techniques to study protein stability and protein-ligand interactions, with particular emphasis on pharmaceutical development.

Wayne J. Brouillette. Professor (Chemistry); Design and synthesis of small organic molecules as new drugs. Active projects include neuraminidase inhibitors as drugs for influenza; NAD synthetase inhibitors as biological warfare defense agents and broad spectrum antibacterial agents; sodium channel ligands as neuroprotective (anti-stroke), analgesic, and anticancer agents; and retinoids as chemopreventive and chemotherapeutic agents. Combinatorial chemistry, structure-based drug design, and computer-assisted methods such as in silico screening (FlexX) and 3D-QSAR (CoMFA) are utilized.

David E. Graves, Professor and Chair (Chemistry); Biophysical Chemistry, nucleic acid structure and function, interactions of ligand-DNA interactions, development of novel topoisomerase I and II inhibitors for cancer chemotherapy.

Gary M. Gray, Professor (Chemistry); Inorganic Chemistry, Transition metal P-donor complexes, chemistry of metallacrown ethers, transition metal complexes that combine the catalytic abilities of transition metal complexes of phosphorus-donor ligands with the cation and small molecule binding abilities of crown ethers, synthesis of metal containing polymers for use in laser fusion, transition metal complexes can exhibit third-order optical nonlinearities.

Tracy P. Hamilton, Associate Professor (Chemistry); Physical Chemistry, *Ab Initio* theoretical chemistry development and applications, reactions of nitric oxide (NO) with superoxide (O2). Predictions of the vibrational spectroscopy of peroxynitrite and its salts, the UV- visible electronic spectrum, the NMR shifts, the energetics, and the reactions of peroxynitrite with other molecules such as carbon dioxide.

Eugenia Kharlampieva, Assistant Professor (Chemistry)

Aaron L. Lucius, Assistant Professor (Chemistry); Biophysical Chemistry, Kinetic and thermodynamic methods to examine catalyzed protein unfolding, DNA helicase and DNA gyrase mechanisms.

Joe L. March, Associate Professor (Chemistry); Chemical Education, teaching methods in General Chemistry; Strategies in peer-led instruction, guided-inquiry laboratories, and incorporation of technology in the curriculum.

Craig P. McClure, Assistant Professor (Chemistry); Chemical Education, development of novel chemistry instruction pedagogy, enhancement of retention in introductory chemistry for nonscience majors.

Donald D. Muccio, Professor (Chemistry); Biophysical Chemistry, the use and interpretation of spectroscopy, including NMR and circular dichroism CD to probe structures, folding, and ligand binding of conformationally constrained retinoids, peptides that damage the cornea in the alkaline-injured eye, and NAD synthetase - a new target for antibacterial agents.

Jacqueline A. Nikles, Associate Professor (Chemistry); Chemical Education, development of novel methods for enhancing organic chemistry instruction and student retention.

James C. Patterson, Assistant Professor (Chemistry); Computational methods to study the reaction mechanisms of metalloenzymes and the dynamic of membrane-associated proteins.

Sadanandan E. Velu, Assistant Professor (Chemistry); Organic Synthesis, total synthesis of natural compounds with biological activities, development of novel topoisomerase I and II inhibitors, antibacterial drug development.

Sergey Vyazovkin, Associate Professor (Chemistry); Analytical Chemistry. Thermophysical properties and reactions of polymeric, energetic, and pharmaceutical materials using a variety of analytical techniques including Infrared (IR) spectroscopy, Mass Spectrometry (MS), Thermogravimetric Analysis (TGA), Differential Scanning Calorimetry (DSC), Thermomechanical Analysis (TMA), Dynamic Mechanical Analysis (DMA), Polarized Light Microscopy (PLM). Kinetic analysis of thermal data plays the key role in our work. We develop and apply our original kinetic methodology known as “Model-free Kinetics”.

Pengfei Wang, Assistant Professor (Chemistry); Organic Chemistry, Discovery and development of new methods and their application toward prodrug design and synthesis, carbohydrate chemistry, and synthesis of biologically important natural products. The main focus centers on the development of new reactions and methodologies which would lead to general, flexible and dependable approaches to various synthetic and medicinal targets.

Program Information

General Requirements

The graduate curricula in the Department of Chemistry are designed to ensure superior disciplinary quality and research competency in target research areas that UAB can uniquely offer. This department has an outstanding research active faculty that provides a very favorable faculty/student ratio to encourage close contacts between students and their faculty research advisors and provides opportunities for mentors to give personalized attention to the academic and research progress of each of their students.

All graduate students are required to pursue a graduate curriculum that provides the general knowledge-based foundation for the student's program through a series of six core curriculum courses (18 semester hours). All students are required to enroll in two Foundations Courses [CH 700, Foundations I (Analytical and Physical); CH 701, Foundations II (Organic and Inorganic)] and four additional courses that they may select to complete their course requirements. Graduate students also enroll in courses offered in the Basic Health Sciences and the Joint Material Sciences Programs to broaden their backgrounds in selective areas and greatly strengthen their ability to carry out interdisciplinary research. Students involved in interdisciplinary programs (pharmaceutical design, materials science, molecular biophysics, forensic science, etc.) may, with the approval of their Advisory Committee, make appropriate substitutions for some of the courses, i.e. Polymer/Materials Chemistry, Biochemistry, etc. A grade of B must be earned in each of these courses for Admission to Candidacy in the Ph.D. program. Courses may be repeated once to raise the grade.

All graduate students are to demonstrate communication skills competencies. Adequate performance is required on the literature seminar, written responses to essay exams, dissertation defense, teaching, written publications, presentations at professional meetings, and/or enrollment in the Graduate School course series GRD 701 (Presentation and Discussion Skills), GRD 702 (Writing Up Research), and GRD 717 (Principles of scientific integrity). All incoming international graduate students will be required to take GRD 700 (Culture and speaking in the US as well as GRD 714 (Individualized Pronunciation and Accent Training). All graduate students are required to present a departmental literature seminar after their first year.

Students must select a research advisor after their first year and have a research committee in place by the end of their third semester. This selection occurs after the student has interviewed each graduate faculty member in the Department of Chemistry. The student and the major professor will recommend to the director of the graduate program in chemistry the composition of the graduate study committee.
Core Courses: CH 629/729, CH 631/731, CH 632/732, CH 633/733, CH 639/739, CH 642/742, CH 649/749, CH 659/759, CH 664/764, CH 669/769, CH 671/771, CH 689/789
Substitutions are permitted with the approval of the student's research advisory committee and director of

the graduate program.
Master's students choose from the 600 courses, Ph.D. students from the 700 courses.

M.S. Program

Plan I

Plan I is a research program that requires a minimum of 24 semester hours (including 18 semester hours of core courses) of formal academic coursework approved by the student's graduate study committee. The progress of the student's research program is monitored by the graduate study committee. The student, having been admitted to candidacy and having completed an approved plan of research, will complete and defend a thesis.

Plan II

Plan II is a nonthesis program that requires a minimum of 30 semester hours (including 18 semester hours of core courses) of appropriate graduate work that has been approved by the student's graduate study committee.

Ph.D. Program

For Ph.D. students, there are no specific course requirements beyond the core courses. The academic program is determined through the action of the student's graduate study committee. A written qualifying examination must be passed in the student's area of specialization. If failure occurs, only one repeat exam is allowed. A research proposal must be defended within 12 months of completion of the written qualifying examination. If failure occurs, one repeat defense is allowed. The student, having been admitted to candidacy and having completed an approved plan of research, will submit a dissertation to the Graduate School. This dissertation must be defended at an open meeting. **Additional Information**

NIBIB Supported T-32 Predoctoral Training Grant

National Institute of Biomedical Imaging and Bioengineering (NIBIB) has awarded an interdisciplinary predoctoral training grant to UAB that is entitled “Nanotechnology in Biosensors and Bioengineering”. It is a five year program that started on September 1, 2007. Benefits to participating graduate students include: graduate stipends of $25,000 per year, full tuition and health insurance, and a travel award of $1,000 per year. The purpose of this grant is to implement a training program at the interfaces of physics, chemistry, materials science and engineering, and biomedical engineering that will reduce the time from discovery of a new tool in nanotechnology to its application in medical devices, tissue engineering, and biosensors for earliest detection of molecular signatures of disease.

For more information regarding this training program, visit http://www.uab.edu/cnmb/graduate/index.html.

Deadline for Entry Term(s):	Each semester
Deadline for All Application Materials to be in the Graduate School Office:	Six weeks before term begins
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)
Comments	None
Graduate Catalog Description	http://main.uab.edu/show.asp?durki=24862

For detailed information, contact Dr. David E. Graves, Department of Chemistry Graduate Program Director, CHEM 201C, 1530 3rd Avenue South, Birmingham, AL 35294-1240.
Telephone 205-975-8094

E-mail dgraves@uab.edu
Web www.chem.uab.edu

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

Chemistry (CH)

525. Physical Chemistry I for Graduate Study. Thermodynamics and chemical equilibria; and chemical kinetics. Prerequisites: MA 126, PH 202, CH 117. Fall.

526. Physical Chemistry II for Graduate Study. Quantum mechanics, chemical bonding, and molecular spectroscopy. Prerequisite: CH 525. Spring.

535. Organic Chemistry I for Graduate Study. Structure of organic compounds based on bonding, stereochemical, and physical properties. Fall, spring, summer.

537. Organic Chemistry II for Graduate Study. Practical and theoretical considerations of organic reactions; Introduction to spectroscopy. Prerequisite: CH 535. Fall, Spring, Summer.

540. Inorganic Chemistry I for Graduate Study. Chemical reactivity and descriptive chemistry in terms of structural and electronic parameters. Fall.

541. Transition Metal Chemistry. Atomic structure, chemical bonding characterization and reactivity of transition metal complexes. Prerequisite: CH 345, CH 326. Spring.

550. Analytical Chemistry I for Graduate Study. Analytical measurements, spectrophotometric and gravimetric analyses, chromatography, and chemical equilibrium. Spring.

550L. Analytical Chem I Grad Lab. Advanced Analytical Chemistry I Laboratory

555. Quantitative Analysis. General operating principles and quantitative applications of commonly used analytical instruments. Prerequisite: CH 550. Spring.

555L. Quantitative Analysis Lab. Advanced Analytical Chemistry I laboratory

560. Fundamentals of Biochemistry. Overview of biochemical principles; chemistry of aqueous solutions, biochemical building blocks including amino acids, carbohydrates, lipids, and nucleotides; structure and function of proteins, membranes and nucleic acids; enzyme kinetics. Catabolic and anabolic metabolism in biomolecules, regulation of metabolic processes.

561. Biochemistry I: Introduction to biological macromolecules and chemistry and physical properties of component building blocks. Prerequisites: 237 and 355. Successful completion of CHEM 561 is a prerequisite for CHEM 562. Fall.

562. Biochemistry II. Continuation of biochemistry including molecular genetics (replication, transcription, and translation), metabolic pathways, control of gene expression. Prerequisite: 561. Spring.

563. Biochemistry Laboratory. Introduction to modern analytical techniques used for the isolation and characterization of biological macromolecules. Prerequisites: CH 355 and CH 461 and permission of instructor.

564. Physical Biochemistry Laboratory. Physical/analytical approaches toward determination of macromolecular structures, ligand binding, and enzymology. Prerequisites: CH 325, CH 355, and CH 461 or permission of instructor.

580. Polymer Chemistry I. (also MSE 530). Structure and properties of crystalline and amorphous polymers; polymer processing; correlation of polymer structure with processability and performance. Synthesis and characterization of polymers; polymerization reactions, kinetics, and mechanisms; polymer solution properties. Prerequisite: CH 237, 325, or MSE 254. Spring.

580L. Polymer Chem Grad Lab. Introduction to Polymer Chemistry I Laboratory

581. Polymer Chemistry II. Synthesis and characterization of polymers: polymerization reaction kinetics and mechanisms; polymer solution properties. Prerequisite: CH 580 and concurrent enrollment in CH 581L.

600. Foundations of Physical and Analytical Chemistry. Molecular thermodynamics and molecular reaction dynamics, chemical equilibrium and solubility in aqueous/organic solutions, and ligand binding to macromolecules in aqueous solution. Fall.

601. Foundations of Organic and Inorganic Chemistry. Organic – Bonding and structure, concerted pericyclic reactions, stereochemistry, effects of conformation, sterics and electronics on reactivity; and the study of reaction mechanisms with emphasis on nucleophilic substitution. Inorganic – Bonding and structure including basic molecular orbital theory, the solid state, Lewis acid-base chemistry, coordination chemistry, reaction mechanisms for transition metal complexes and characterization of transition metal complexes.

602. Principles of Chemical Instruction. Responsibilities of laboratory instructors, safety regulations, grading, teaching styles and formats, and instructional objectives. Prerequisite: Permission of instructor. Fall. 1 hour.

610. Laboratory Experiences in Chemistry I. Application of simple experiments to high school science programs.

611. Laboratory Experiences in Chemistry II. Continuation of CH 602.

612. Polymer Chemistry for Teachers. Lecture and laboratory experiences focusing on natural and synthetic polymers. Morning lectures by polymer chemists with afternoon labs where polymers are synthesized and studied. Emphasis is on practical application and new developments in polymer chemistry. Experiments are suitable for high school science programs.

613. Introductory Organic Chemistry for Teachers. A laboratory, lecture, demonstration course on the nature of carbon compounds including hydrocarbons, functional groups and their reactions. Emphasis given to laboratory experiments and demonstrations suitable for high school students.

614. Introductory Biochemistry for Teachers. Lecture series covering carbohydrates, lipids, and proteins. Emphasis given to practical applications and relationship between chemistry and biology. Aspects of nutrition are discussed.

615. Introductory Biochemistry for Teachers II. Lecture series covering vitamins, minerals, enzymes, biochemical energy and metabolism. Strong connections between chemistry and biology. Practical applications are emphasized.

616. Chemical Demonstrations. A laboratory-based course exploring the teaching potential of selected chemical reactions. Teachers perform at least 50 demonstrations in the laboratory and share ways they can use these in their own classes. Emphasis on facilitating learning of chemistry.

617. Chemical Demonstrations II. At least 50 demonstrations will be performed. Focus is on safe, practical and effective experiments suitable for high school students.

619. Special Topics in Chemical Education. Topics determined by interest of students and faculty.

625. Molecular Structure and Spectroscopy. Classical and quantum mechanical descriptions of molecular structure and bonding. Basic principles and techniques of molecular spectroscopic methods. Exercises and experiments with computational software and spectroscopic instrumentation will be conducted.

629. Special Topics in Physical Chemistry. Topics determined by interest of s students and faculty. Typical are computational chemistry, molecular spectroscopy, nuclear magnetic resonance. Prerequisite: CH 600 or permission of Instructor. 1 – 3 hours.

630. Physical Organic Chemistry. Localized and delocalized chemical bonds, stereochemistry, acidity and basicity, determining organic mechanisms and structure. Fall.

631. Organic Reactions and Their Mechanisms. Nucleophilic and electrophilic substitution, free radical substitutions, additions to carbon-carbon and carbon-hetero multiple bonds, elimination reactions. Prerequisite: CH 730. Spring.

632. Organic Reactions and Synthesis. Strategy of synthesis, carbon skeletal assembly, selective functional group interconversion, blocking groups, stereochemical control. Prerequisite: CH 731. Spring.

633. Reactive Intermediates and Conservation of Bonding. Behavior of organic molecules in static and reactive situations. Prerequisite: CH 731 or permission of instructor. Spring.

639. Special Topics in Organic Chemistry. Topics determined by interest of students and faculty. Prerequisite: CH 327. 1-3 hours.

640. Bonding and Structure in Inorganic Compounds. Advanced treatment of bonding in main group and transition metal compounds, and a study of its relationship to the properties of compounds. Prerequisite: CH 540 or permission of instructor. Spring.

642. Organometallic Chemistry and Catalysis. Study of transition metal organometallic compounds and their applications as homogeneous catalysts for organic and polymer syntheses. Prerequisite: CH 640 or 740 or permission of instructor. Summer (alternate years).

649. Special Topics in Inorganic Chemistry. Topics determined by interest of students and faculty. Prerequisite: Permission of instructor. 1-3 hours.

650. Chemometrics. Introduction to basic data analysis techniques that include testing hypotheses, establishing tendencies and correlations, experimental design, etc. The course is designed to provide a support to a research chemist in effectively solving everyday problems associated with production and interpretation of experimental data. Prerequisite: Permission of instructor.

651. Chemometrics. Kinetic methods of analysis, fundamental principles of electrochemical, separation, and spectroscopic methods of analysis. Spring.

656. Analytical Separations. Advanced treatment of distillation, extraction, gas chromatography, HPLC, TLC, and GC-MS.

659. Thermal processes and methods. Introduction to thermally initiated physical and chemical processes in the condensed phase systems such as liquids, crystalline solids, and glasses (amorphous solids). The course covers the use of calorimetry, thermogravimetry, and thermomechanical methods for exploring thermodynamics and kinetics of crystallization, glass transition, solid-solid and helix-coil transitions, decomposition, polymerization, etc. Prerequisite: permission of instructor.

660. Fundamentals of Biochemistry. Overview of biochemical principles; chemistry of aqueous solutions, biochemical building blocks including amino acids, carbohydrates, lipids, and nucleotides; structure and function of proteins, membranes and nucleic acids; enzyme kinetics. Catabolic and anabolic metabolism in biomolecules, regulation of metabolic processes.

661. Biochemistry II. Biochemistry II: Structure and function of proteins, membranes, membrane proteins, and nucleic acids. Ligand binding and enzyme kinetics. Molecular genetics (replication, transcription, translation) and the control of gene expression and protein synthesis.

663. Biochemistry Laboratory. Introduction to modern analytical techniques used for the isolation and characterization of biological macromolecules.

664. Biophysical Chemistry. Common physical methods for understanding the structure and stability of macromolecules that include several spectroscopic, thermodynamic and computational methods. Underlying physical principle described, instrumentation discussed, and examples cited from the literature. Prerequisite: CH 325 or 461. Spring.

669. Special Topics in Biochemistry. Detailed consideration of areas of special interest. Prerequisite: CH 462.

670. Chemical Literature. Use of on-line literature and development of searching techniques.

671. Medicinal Chemistry & Drug Discovery. Description. Emphasis on design strategies for small organic drugs using common macromolecular drug targets. Examples of successful design for clinically used drug classes will be presented. Prerequisites include undergraduate organic chemistry (CH235 and CH237) and undergraduate biochemistry (CH461) or equivalent.

672. Chemistry of Natural Products. The principal focus of this course will be the introduction of synthesis and medicinal chemistry of natural products. Drugs discovery using natural products, with specific examples in the areas of antibacterials, anticancer, and analgesic drugs will be introduced. An overview of structural classes, biosynthetic pathways and application of asymmetric synthesis in the synthesis of specific examples from each class will be discussed. This course is intended for undergraduate students at the senior level.

680. Intro to Polymer Chem I. Structure and properties of crystalline and amorphous polymers; polymer proprocessing; correlation of polymer structure with processability and performance. Preq: CH 237 or permission of instructor or MSE 350 and concurrent enrollment in CH 680L.

680L. Intro to Polymer Chem I Lab. Introduction to Polymer Chemistry I Laboratory required with CH 680 lecture

681. Intro to Polymer Chemistry II. Synthesis and characterization of polymers:polymerization reaction kinetics and mechanisms; polymer solution properties

681L. Intro to Polymer Chem II Lab. Introduction to Polymer Chemistry II Laboratory required with CH 681 lecture

689. Special Topics in Polymer Chemistry. Detailed consideration of areas of special interests in polymer chemistry. Prerequisite: CH 580, 581.

691. Seminar. Seminars on current topics in chemical research. Pass/Fail. 1 hour.

692. Seminar Presentation. Seminar given by graduate students on current topics in chemical research. 2 hours.

698. Graduate Research. Prerequisite: Permission of graduate faculty member. Pass/Fail. 1-8 hours.

699. M.S. Thesis Research. Prerequisites: Admission to candidacy and permission of graduate faculty member. 1-8 hours.

700. Foundations of Physical and Analytical Chemistry. Molecular thermodynamics and molecular reaction dynamics, chemical equilibrium and solubility in aqueous/organic solutions, and ligand binding to macromolecules in aqueous solution. Fall.

701. Foundations of Organic and Inorganic Chemistry. Organic – Bonding and structure, concerted pericyclic reactions, stereochemistry, effects of conformation, sterics and electronics on reactivity; and the study of reaction mechanisms with emphasis on nucleophilic substitution. Inorganic – Bonding and structure including basic molecular orbital theory, the solid state, Lewis acid-base chemistry, coordination chemistry, reaction mechanisms for transition metal complexes and characterization of transition metal complexes.

702. Principles of Chemical Instruction. Responsibilities of laboratory instructors, safety regulations, grading, teaching styles and formats, and instructional objectives. Prerequisite: Permission of instructor. Fall. 1 hour.

710. Laboratory Experiences in Chemistry I. Application of simple experiments to high school science programs.

711. Laboratory Experiences in Chemistry II. Continuation of CH 602.

712. Polymer Chemistry for Teachers. Lecture and laboratory experiences focusing on natural and synthetic polymers. Morning lectures by polymer chemists with afternoon labs where polymers are

synthesized and studied. Emphasis is on practical application and new developments in polymer chemistry. Experiments are suitable for high school science programs.

713. Introductory Organic Chemistry for Teachers. A laboratory, lecture, demonstration course on the nature of carbon compounds including hydrocarbons, functional groups and their reactions. Emphasis given to laboratory experiments and demonstrations suitable for high school students.

714. Introductory Biochemistry for Teachers. Lecture series covering carbohydrates, lipids, and proteins. Emphasis given to practical applications and relationship between chemistry and biology. Aspects of nutrition are discussed.

715. Introductory Biochemistry for Teachers II. Lecture series covering vitamins, minerals, enzymes, biochemical energy and metabolism. Strong connections between chemistry and biology. Practical applications are emphasized.

716. Chemical Demonstrations I. A laboratory-based course exploring the teaching potential of selected chemical reactions. Teachers perform at least 50 demonstrations in the laboratory and share ways they can use these in their own classes. Emphasis on facilitating learning of chemistry.

717. Chemical Demonstrations II. At least 50 demonstrations will be performed. Focus is on safe, practical and effective experiments suitable for high school students.

719. Special Topics in Chemical Education. Topics determined by interest of students and faculty

725. Molecular Structure and Spectroscopy. Classical and quantum mechanical descriptions of molecular structure and bonding. Basic principles and techniques of molecular spectroscopic methods. Exercises and experiments with computational software and spectroscopic instrumentation will be conducted.

729. Special Topics in Physical Chemistry. Topics determined by mutual student-faculty interest. Typical are computational chemistry, molecular spectroscopy, nuclear magnetic resonance. Prerequisite: CH 700 or permission of Instructor. 1 – 3 hours.

730. Physical Organic Chemistry. Localized and delocalized chemical bonds, stereochemistry, acidity and basicity, determining organic mechanisms and structure. Fall.

731. Organic Reactions and Their Mechanisms. Nucleophilic and electrophilic substitution, free radical substitutions, additions to carbon-carbon and carbon-hetero multiple bonds, elimination reactions. Prerequisite: CH 730. Spring.

732. Organic Reactions and Synthesis. Strategy of synthesis, carbon skeletal assembly, selective functional group interconversion, blocking groups, stereochemical control. Prerequisite: CH 731. Spring.

733. Reactive Intermediates and Conservation of Bonding. Behavior of organic molecules in static and reactive situations. Prerequisite: CH 731 or permission of instructor. Spring.

739. Special Topics in Organic Chemistry. Topics determined by interest of students and faculty. Prerequisite: CH 327. 1-3 hours.

740. Bonding and Structure in Inorganic Compounds. Advanced treatment of bonding in main group and transition metal compounds, and a study of its relationship to the properties of compounds. Prerequisite: CH 540 or permission of instructor. Spring.

742. Organometallic Chemistry and Catalysis. Study of transition metal organometallic compounds and their applications as homogeneous catalysts for organic and polymer syntheses. Prerequisite: CH 640 or 740 or permission of instructor. Summer (alternate years).

749. Special Topics in Inorganic Chemistry. Topics determined by interest of students and faculty. Prerequisite: Permission of instructor. 1-3 hours.

750. Chemometrics. Introduction to basic data analysis techniques that include testing hypotheses, establishing tendencies and correlations, experimental design, etc. The course is designed to provide a support to a research chemist in effectively solving everyday problems associated with production and interpretation of experimental data. Prerequisite: Permission of instructor.

751. Chemometrics. Kinetic methods of analysis, fundamental principles of electrochemical, separation, and spectroscopic methods of analysis. Spring.

759. Thermal processes and methods. Introduction to thermally initiated physical and chemical processes in the condensed phase systems such as liquids, crystalline solids, and glasses (amorphous solids). The course covers the use of calorimetry, thermogravimetry, and thermomechanical methods for exploring thermodynamics and kinetics of crystallization, glass transition, solid-solid and helix-coil transitions, decomposition, polymerization, etc. Prerequisite: permission of instructor.

760. Fundamentals of Biochemistry. Overview of biochemical principles; chemistry of aqueous solutions, biochemical building blocks including amino acids, carbohydrates, lipids, and nucleotides; structure and function of proteins, membranes and nucleic acids; enzyme kinetics. Catabolic and anabolic metabolism in biomolecules, regulation of metabolic processes.

761. Biochemistry II. Biochemistry II: Structure and function of proteins, membranes, membrane proteins, and nucleic acids. Ligand binding and enzyme kinetics. Molecular genetics (replication, transcription, translation) and the control of gene expression and protein synthesis.

763. Biochemistry Laboratory. Introduction to modern analytical techniques used for the isolation and characterization of biological macromolecules.

764. Biophysical Chemistry. Common physical methods for understanding the structure and stability of macromolecules that include several spectroscopic, thermodynamic and computational methods. Underlying physical principle described, instrumentation discussed, and examples cited from the literature. Prerequisite: CH 325 and 461. Spring.

769. Special Topics in Biochemistry. Detailed consideration of areas of special interest. Prerequisite: CH 462. 1-3 hours.

770. Chemical Literature. Use of on-line literature and development of searching techniques.

771. Medicinal Chemistry & Drug Discovery. Description. Emphasis on design strategies for small organic drugs using common macromolecular drug targets. Examples of successful design for clinically used drug classes will be presented. Prerequisites include undergraduate organic chemistry (CH235 and CH237) and undergraduate biochemistry (CH461) or equivalent.

772. Chemistry of Natural Products. The principal focus of this course will be the introduction of synthesis and medicinal chemistry of natural products. Drugs discovery using natural products, with specific examples in the areas of antibacterials, anticancer, and analgesic drugs will be introduced. An overview of structural classes, biosynthetic pathways and application of asymmetric synthesis in the synthesis of specific examples from each class will be discussed. This course is intended for undergraduate students at the senior level.

780. Intro to Polymer Chem I. Structure and properties of crystalline and amorphous polymers; polymer proprocessing; correlation of polymer structure with processability and performance. Preq: CH 237 or permission of instructor or MSE 350 and concurrent enrollment in CH 780L.

780L. Intro to Polymer Chem I Lab. Introduction to Polymer Chemistry I Laboratory required with CH 780 lecture.

781. Intro to Polymer Chemistry II. Synthesis and characterization of polymers:polymerization reaction kinetics and mechanisms; polymer solution properties.

781L. Intro to Polymer Chem II Lab. Introduction to Polymer Chemistry II Laboratory required with CH 781 lecture.

789. Special Topics in Polymer Chemistry. Detailed consideration of areas of special interests in polymer chemistry. Prerequisite: CH 580, 581.

790. Intro to Graduate Research. The purpose of this course is to acquaint incoming graduate student with departmental, school and university policies and procedures for conducting research and teaching undergraduate students. Pass/Fail

791. Seminar. Seminars on current topics in chemical research. Pass/Fail. 1 hour.

792. Seminar Presentation. Seminar given by graduate students on current topics in chemical research. 2 hours.

798. Nondissertation Research. Prerequisite: Permission of graduate faculty member. Pass/Fail. 1-8 hours.

799. Dissertation Research. Prerequisite: Admission to candidacy and permission of graduate faculty member. 1-8 hours.

Communication Management (M.A.)

Degree Offered:	M.A.
Director:	Mark Hickson, PhD
Phone:	(205) 934-3877
E-mail:	hickson@uab.edu
Web site:	http://www.uab.edu/communication/graduate-program

Faculty

Jonathan Amsbary, Associate Professor (Communication Studies)

Mark Hickson, Professor/Program Director (Communication Studies)

Eduardo Neiva, Proefssor (Communication Studies)

Larry Powell, Professor (Communicaiton Studies)

Virginia Peck Richmond, Professor (Communication Studies)

M.S. Program

The master's degree program in communication management is targeted at professionals in the fields of public relations, print and broadcast journalism, and other related areas. Students can explore practical and theoretical applications in professional communication fields. Classes are held primarily or exclusively at night and on the weekends to benefit working students. The program will award sutdents with a master's degree in communication managements. Students in the program will need to complete 36 semester hours of graduate study. The range of courses are designed to allow students to customize their studies according to their career goals.

Additional Information

Deadline for Entry Term(s):	Every semester
Deadline for All Application Materials to be in the Graduate School Office:	Two months before term begins
Number of Evaluation Forms Required:	3 from college professors
Entrance Tests	GRE or MAT (TOEFL and TWE for international applicants whose native language is not English.)

For additional information, contact Dr. Mark Hickson, Program Director, HHB, Room 341, 1401 University Boulevard, Birmingham, AL 35294-1152.

Telephone 205-934-3877

E-mail **hickson@uab.edu**

Web http://www.uab.edu/communication/graduate-program

Course Descriptions

Communication Management (CM)

Unless otherwise noted, all courses are for 3 semester hours of credit. Courses numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

601. **Foundations of Communication Management**. Development of communication models, relationships between models and research, examination of functions of models and their impact on human communication in various media.

602. **Source Credibility**. Theories of ethos, dynamics of credibility in public speaking, organizational, interpersonal, print, and broadcasting contexts. Measures of credibility and methods for constructing credibility.

603. **Message Construction**. Features of communication messages, including audience, situation, and culture and their impact on message construction. The principles underlying the creation of messages in various media.

604. **Audience Analysis**. Analysis of the audience and its place in the communication model. Includes needs and gratifications from various media as well as how messages and feedback are interpreted.

605. **Communication Effects**. Effects of communication, especially through mass media, as a result of messages transmitted. Topics include violence, persuasion, and sexuality.

607. **Seminar in Applied Human Communication**. Topics include interpersonal communication, small group communication, organizational communication, and political communication.

609. **Special Topics in Communibiology**. Communication personality traits are the focus of this class

610. **Instructional Communication**. The instructional class makes theory and research accessible to students who want to learn more about teaching, communication, and learning.

611. **Seminar in Organizational Communication**. The study of communication theory, practice and research in the organizational context.

612. **Instructional Communication**. Makes theory and research accessible to students who want to learn more about teaching, communication and learning.

613. **Nonverbal Communication**. The study of theory, research and application of communication in various nonverbal contexts.

614. **Seminar in Political Communication**. The application of communication theory and research as they apply to political movements.

615. **Intercultural Communication**. The study of verbal and nonverbal communication theory and research as it applies to various cultural and intercultural contexts.

616. **Seminar in Health and Medical Communication**. The study of communication theory and research as is applies to the various relationships within the healthcare system.

617. **Training and Development in Communication**. Applying communication theory and research into practical contexts.

618. **Independent Study**. Topics of mutual interest to student and faculty member. Prerequisites: 15 hours in CM courses and written permission of instructor prior to registration.

619. **Communication and the Law**. An examination of various legal issues as they apply to communication behaviors and how communication theory and research impact the practice of law.

675. **Graduate Internship**. Professional experience in communication management.

691. **Seminar in Communication Management**. Theory and research as they apply to a variety of subjects of interest to both the instructor and students. Special emphasis will be placed on developing issues addressed in other classes.

694. **Quantitative Communication Research**. Study of human communication from a quantitative perspective, including experimental design and survey methods using parametric and non-parametric statistics.

696. **Qualitative Communication Research**. Study of communication theory from a qualitative perspective. Historical/critical, participant-observations, and various data gathering methods and models explored from theoretical and practical point of view.

698. **Master's Applied Project**. Development of project as requisite for obtaining the MA in Communication Management.

699. **Thesis Research**. Development of thesis as requisite for obtaining the MA in Communication Management.

Computer and Information Sciences (Ph.D., M.S.)

Degree Offered: Ph.D., M.S.

Director: *Dr. Purushotham Bangalore*

Phone: (205) 934-8604

E-mail: puri@uab.edu

Web site: www.cis.uab.edu/graduate/

Faculty

Purushotham V. Bangalore, Associate Professor and Graduate Program Director (Computer and Information Sciences); Grid/Cloud Computing, High Performance Computing, Bioinformatics

Ragib Hasan, Assistant Professor (Computer and Information Sciences); Computer Security, Cloud Computing, Data Provenance, Information Assurance

Robert M. Hyatt, Associate Professor (Computer and Information Sciences); Computer Chess, Parallel Architectures and Software

John K. Johnstone, Associate Professor (Computer and Information Sciences); Shape Modeling, Biomedical Modeling, Computer Graphics, Computer Vision

Peter Pirkelbauer, Assistant Professor (Computer and Information Sciences); Compilers, Runtime Systems, High Performance Computing, Non-Blocking Software Design.

Nitesh Saxena, Assistant Professor (Computer and Information Sciences); Computer and Network Security, Applied Cryptography

Anthony Skjellum, Professor and Chair (Computer and Information Sciences); Parallel and High Performance Computing

Kenneth R. Sloan, Associate Professor (Computer and Information Sciences); Computer Graphics, Computer Vision, Image Processing, 3D printing, Anatomy of the Retina

Thamar Solorio, Assistant Professor (Computer and Information Sciences); Natural Language Processing, Artificial Intelligence, Cyber Forensics.

Alan P. Sprague, Professor (Computer and Information Sciences); Data Mining, Graph Algorithms, Bioinformatics, Cyber Forensics.

Chengcui Zhang, Associate Professor (Computer and Information Sciences); Databases, Data Mining

Program Information

The field of computer and information sciences deals with theory and methods for processing of information. Graduate programs leading to the M.S. and Ph.D. degrees are designed to prepare individuals for professional and research-level careers in industry, government, and academia. Prospective students should have substantial background in computer science and mathematics.

M.S. Program

The M.S. program requires 30 semester hours of coursework and a thesis (Plan I) or 36 semester hours of coursework (Plan II). Specializations are available in bioinformatics, computer graphics, distributed computing and software engineering.

Ph.D. Program

The Ph.D. program consists of three phases (with some overlap between phases). The first phase of the program is devoted primarily to formal coursework and preparation for the qualifying examination. The second phase consists of coursework and research in preparation for the comprehensive examination. This examination requires presentation of a dissertation research proposal. Successful completion of this phase leads to admission to candidacy. The final phase is the completion of the dissertation research and its defense. Ph.D. student progress will be reviewed annually.

Additional Information

Deadline for Entry Term(s):	February 1 for Fall; September 1 for Spring.

Contact Information

For detailed information, after first visiting the website below for basic information including application guidelines and prerequisites, contact Dr. Purushotham Bangalore, Associate Professor and Graduate Program Director, UAB Department of Computer and Information Sciences, Campbell Hall, Room 130, 1300 University Boulevard, Birmingham, Alabama 35294-1170.

Telephone 205-934-8604

E-mail puri@uab.edu

Web **http://www.cis.uab.edu/graduate/**

Course Descriptions

Computer and Information Sciences (CS)

All courses require permission of the student's academic advisor. All gradaute courses carry 3 semester hours of credit, unless otherwise specified.

501. **Programming Languages**. Formal syntax and semantics; compilers and interpreters; virtual machines; representation of data types; sequence and data control; type checking; run-time storage management; functional, logic, and object-oriented programming paradigms; concurrency and multi-threading. Prerequisites: Graduate Standing. 3 hours.

510. **Database Management Systems**. Relational model of databases, structured query language, normalized structure of database management systems based on relational model, and security and integrity of databases. Prerequisite: Graduate Standing. 3 hours.

520. **Software Engineering**. Design and implementation of large-scale software systems, software development life cycle, software requirements and specifications, software design and implementation, verification and validation, project management, and team-oriented software development. Prerequisite: Graduate Standing. 3 hours.

533. **Operating Systems**. Internal design and operation of a modern operating system, including interrupt handling, process scheduling, memory management, virtual memory, demand paging, file space allocation, file and directory management, file/user security and file access methods. Prerequisites: Graduate Standing. 3 hours.

534. **Internetworking with TCP/IP.** Underlying network technology. Interconnecting networks using bridges and routers. IP addresses and datagram formats. Static and dynamic routing algorithms. Control messages. Subnet and supernet extensions. UDP and TCP. File transfer protocols. E-mail and the World Wide Web. Network address translation and firewalls. Mandatory weekly Linux-based lab. Prerequisites: Graduate Standing. 3 hours.

534L**. Internetwork w TCP/IP Lab**. Project oriented hands-on approach.

535. **Network Programming**. Remote procedure call and client-server mechanisms. Protocol definition and compilation; client and server stubs, application code; transport independence; multiple client and server systems. Applications, e.g., remote database query and update, image filtering and archiving; systems programming, and file systems contexts. Prerequisite: Graduate Standing. 3 hours.

536. **Computer Network Security**. Conventional and public-key cryptography. Message encryption and authentication. Secure communication between computers in a hostile environment, including E-mail (PGP), virtual private networks (IPSec) and the World Wide Web (SSL). Firewalls. Mandatory weekly linux-based lab. Prerequisite: Graduate Standing. 3 hours.

536L. **Computer Network Sec Lab**. Project oriented hands-on approach.

537. **Cybercrime & Forensics.** Overview of all aspects of media forensics including analysis of character encoding, file formats, and digital media, examination of disk acquisition and duplication techniques in criminal investigation scenarios.

550. **Automata and Formal Language Theory**. Finite-state automata and regular expressions, context-free grammars and pushdown automata, Turing machines, computability and decidability, and complexity classes. Prerequisites: Graduate Standing. 3 hours.

555. **Probability and Statistics in Computer Science**. Introduction to probability and statistics with applications in computer science. Counting, permutations and combinations. Probability, conditional probability, Bayes theorem. Standard probability distributions. Measures of central tendency and dispersion. Central Limit Theorem. Regression and correlation. Hypothesis testing. Random number generation. Random algorithms. Estimating probabilities by simulation. Genetic algorithms. 3 hours

591. **Special Topics**. Prerequisites: Permission of Instructor. 1-3 hours.

592. **Special Topics**. Selected Topics in Computer Science.

593. **Special Topics**. Selected Topics in Computer Science.

594. **Special Topics**. Prerequisites: Permission of Instructor. 1-3 hour.

595. **Special Topics**. Selected Topics in Computer Science.

597. **Competitive Programming Techniques**. This course will help students to be more competitive in the ACM programming contest by exploring numerous problem solving techniques and algorithms not covered in the traditional curriculum. Prerequisites: Graduate Standing. 1 hour.

598. **Practical Work Experience**. Credit for Working in the computer science field. Does not count toward M.S. degree. Prerequisites: Permission of Instructor. 1-3 hours.

600. **Formal Semantics of Programming Languages**. Context-sensitive and semantic aspects of programming languages, denotational semantics, mathematical foundations. Prerequisite: Graduate Standing. 3 hours.

601. **Program Verification**. Proving properties of programs, termination and correctness, computability and decidability, role of formal methods in software design. Prerequisite: Graduate Standing. 3 hours.

602. **Compiler Design I.** Lexical and syntactical scan, semantics, code generation and optimization, dataflow analysis, parallelizing compilers, automatic compiler generation. Prerequisite: CS 505 or equivalent. 3 hours.

603. **Compiler Design II**. Advanced topics in compiler design. Prerequisite: Graduate Standing. 3 hours.

608. **Programming Languages Seminar**. Pass/Fail. Prerequisite: Permission of Instructor. 1 hour.

610. **Database Systems I**. This course offers an introduction to the advanced topics of database management systems. The following topics are addressed: System and file structure, efficient data manipulation using indexing and hashing, query processing, crash recovery, concurrency control, transaction processing, database security and integrity, distributed databases. Prerequisites; CS 510 or equivalent. 3 hours.

611. **Database Systems II**. Relational, hierarchical, and network models; object-oriented databases, knowledge-based systems; security issues, concurrency control and distributed databases, query optimization; advanced topics. Prerequisites; CS 610 or equivalent. 3 hours.

612. **Knowledge-Base Systems**. Logic model for deductive databases, top-down and bottom-up evaluation, conjunctive and disjunctive queries, recursion, query optimization, universal relation model. Prerequisites: CS 610 or equivalent. 3 hours.

613. **Object-Oriented Database Systems**. Object data model, object-oriented query languages and database architecture, schema evolution, integration with non-object-oriented models, query optimization. Prerequisites: CS 610 or equivalent. 3 hours.

614. **Distributed Database Systems**. Distributed DBMS architecture, query decomposition and data localization, distributed query optimization, transaction management, concurrency control, multidatabase systems. Prerequisites: CS 610 or equivalent. 3 hours.

615. **Multimedia Databases**. This course introduces the principles of multimedia databases including multimedia information processing, modeling, and retrieval. The media to be considered include text, image, audio and video. At the conclusion of this course, the students should understand what multimedia data retrieval is, the principles, which allow the location of relevant information from amongst a large corpus of multimedia data, and the applications of multimedia information retrieval. The students should also have the expertise and competence to design and implement retrieval software for multimedia data. Prerequisites: CS 303. 3 hours.

618. **Database System Seminar**. Pass/Fail. Prerequisites: CS 610 or equivalent. 1 hour.

620. **Advanced Software Engineering**. Advanced topics in software design, including: Software modularization, design patterns, formal methods, and software testing. Prerequisites: CS 520 or equivalent. 3 hours.

622. **Reflective and Adaptive Systems**. This course examines the principles of compile-time and run-time adaptation in several contexts, including: reflection, metaprogramming, aspect-oriented software development, and metamodeling (applied to model-driven engineering). Prerequisites: Graduate Standing. 3 hours.

624. **Formal Specification of Software Systems**. Formal methods for software requirements specification, including VDM, Z, and object-oriented extensions; the relationship among formal requirements, design, and implementation. Prerequisites: CS 501. 3 hours.

625. **Metrics and Performance**. Metrics in systems analysis, development, and performance evaluation; querying models; capacity planning for Web system; computation via spreadsheets, discrete simulation, etc. Prerequisites: Graduate Standing. 3 hours.

628. **Software Engineering Seminar**. This is a special topics class that meets once a week to study new research ideas emerging in the area of software engineering. Pass/Fail. Prerequisites: CS 520. 1 hour.

629. **Software Engineering Research Project**. This is a project-based experimental research course affiliated with the Masters Specialization in Software Engineering. Can only be taken as part of a specialization in Software Engineering. Prerequisites: Permission of Instructor. 1-3 hours.

630. **Computer Systems**. Introduction to computer architecture, including memory subsystems, direct-mapped and set-associative cache and multi-level cache subsystems, direct-access devices including RAID and SCSI disk drives, processor pipelining including super-scalar and vector machines, parallel architectures including SMP, NUMA and distributed memory systems, Interrupt mechanisms, and future microprocessor design issues. Prerequisites: Graduate Standing. 3 hours.

631. **Distributed Computing**. Object-oriented distributed systems design, distributed software architecture, data and resource access, communication, client-server computing, web technologies, enterprise technologies. Prerequisites: Graduate Standing. 3 hours.

632. **Parallel Computing**. Overview of parallel computing hardware, architectures, & programming paradigms; parallel programming using MPI, Pthreads, and OpenMP; design, development, and analysis of parallel algorithms for matrix computations, FFTs, and Sorting. Prerequisites: Graduate Standing. 3 hours.

633. **Grid Computing**. Motivation for developing and using Grid Computing, the evolution of Grid Computing, and relationship between Grid Computing and other types of computing such as Cluster Computing, Distributed Computing, Internet Computing, and Peer-to-Peer Computing. Study technologies and architectures used to develop Grids. Prerequisites: CS 631 & CS 632. 3 hours.

634. **Virtualization**. Theory and practice of virtualization. Origins, history, technical and economic motivations. Relationship to network operating systems and operating system architecture. Simulation, Emulation, Virtualization of CPUs, networks, storage, desktops, memory, devices, and combinations thereof. Different approaches to virtualization, including hardware assists and software-only techniques. Techniques, approaches, and methodologies for scale-out and scale-up computing, including security, performance and economic concerns. Prerequisites: CS 333 or CS 433 and CS 430. 3 hours.

636. **Computer Security**. Study of computer security including assurance, authorization, authentication, key distribution, encryption, threats including phishing and key logging, and related distributed computing issues. Theory and practical applications. Prerequisite: Graduate Standing. 3 hours.

638. **Computer Systems Seminar**. Lectures & discussion on advanced topics in Computer Systems. Prerequisite: Permission of Instructor/ 1 hour.

638A. **Computer Systems Seminar**. Lectures & discussion on advanced topics in Computer Systems. Prerequisite: Permission of Instructor/ 1 hour.

638B. **Computer Systems Seminar**. Lectures & discussion on advanced topics in Computer Systems. Prerequisite: Permission of Instructor/ 1 hour.

639. **Distributed Computing Research Project**. Project based course using distributed parallel computing techniques. Can only be taken as part of a specialization in Distributed Computing. 1-3 hours.

640. **Bioinformatics I**. Introduction to computational methodologies in bioinformatics. Prerequisites: Graduate Standing. 3 hours.

641. **Bioinformatics II**. Introduction to computational methodologies in bioinformatics. Prerequisites: CS 640. 3 hours.

647. **Biomedical Modeling**. Modeling from biomedical datasets. Construction and analysis of anatomical models; segmentation; morphometry; registration; medical illustration; surgical planning. Prerequisites: Graduate Standing. 3 hours.

648. **Bioinformatics Seminar**. Pass/Fail. Prerequisites: Permission of Instructor. 1 hour.

649. **Bioinformatics Research Project**. Can only be taken as part of a specialization in Bioinformatics. Pass/Fail. Prerequisites: Permission of Instructor. 1-3 hours.

650. **Automata, Languages, and Computation**. Formal grammars and automata, Turing machines, computability and decidability, computational complexity, intractability. Prerequisites: Graduate Standing. 3 hours.

651. **Formal Language Theory**. Parsing and translation theory, formal syntax, proof properties and complexity measures. Prerequisites: Graduate Standing. 3 hours.

652. **Design and Analysis of Algorithms**. Algorithms for bioinformatics applications, especially string matching algorithms. Also, traditional algorithmic techniques, such as greedy algorithms, dynamic programming, and branch and bound. Prerequisites: Graduate Standing. 3 hours.

653. **Computational Geometry**. Basic methods and data structures, geometric searching, convex hulls, proximity, intersections. Prerequisites: Graduate Standing. 3 hours.

658. **Theoretical Foundations Seminar**. Pass/Fail. Prerequisites: Permission of Instructor. 1 hour.

660. **Principles of Artificial Intelligence**. Programming methodologies, logic foundations, natural language applications, expert systems. Prerequisites: Graduate Standing. 3 hours.

661. **Expert Systems**. Concepts and architectures, tools, reasoning, evaluations, selected examples. Prerequisites: Graduate Standing. 3 hours.

662. **Natural Language Processing**. Syntax, semantics, ATNs, logic grammars, language and memory. Prerequisites: Graduate Standing. 3 hours.

663. **Knowledge Discovery & Data Mining**. Techniques used in data mining (such as frequent sets and association rules, decision trees, Bayesian networks, classification, clustering), algorithms underlying these techniques, and applications. Prerequisites: Graduate Standing. 3 hours.

664. **Knowledge Representation**. Logic, production systems, semantic nets, frames, multiple representational systems. Prerequisites: Graduate Standing. 3 hours.

665. **Neural Networks**. Theoretical foundations, associative memory, pattern processing, biological neural nets. Prerequisites: Graduate Standing. 3 hours.

666. **Games & Puzzles Seminar.** Interfaces and Engines for games and puzzles such as Chess, Checkers, Othello, Rubik's Cube, Go, Sudoku, etc. Prerequisites: Graduate Standing. 1 hour.

668. **Artificial Intelligence Seminar**. Pass/Fail. Prerequisites: Permission of Instructor. 1 hour.

670. **Computer Graphics**. Graphics architectures, geometric transforms, 3-D, object models, shading, intensity, hidden elements, color, advanced topics. Prerequisites: Graduate Standing or Permission of Instructor. 3 hours.

671. **Shape Design**. This course covers various aspects of the design of shape models. These models are used in computer graphics, automobile and aircraft design, robotics, anatomical modeling, and many other disciplines. Point clouds, meshes, Bezier and B-spline curves and surfaces, implicits, subdivision surfaces, interpolation, intersection, building geometry from images. Prerequisites: Graduate Standing. 3 hours.

672. **Motion Design**. The description of a motion is important in robotics, computer animation, game design, and many other disciplines. This course covers various aspects of motion design. Position control, orientation control, camera control, motion planning, collision detection, swept surfaces, visibility analysis. Prerequisites: Graduate Standing. 3 hours.

673. **Computer Vision Systems**. Image understanding feature extraction, domain-specific knowledge for high-level vision. Prerequisites: Graduate Standing. 3 hours.

675. **Computer Visualization**. Advanced Computer Graphics techniques aimed at "Scientific Visualization" applications. Prerequisites: Graduate Standing. 3 hours.

676. **Structure from Motion**. Structure from motion extracts geometric information from a series of images of an object, either still photographs or video streams. The position of the camera may also be computed, yielding camera paths. This topic has powerful applications in many areas, including computer graphics, computer vision, photography, visualization, and video augmentation. Projective geometry, multiple view geometry, feature extraction. Prerequisites: Graduate Standing. 3 hours.

678. **Graphics and Image Processing Seminar**. Pass/Fail. Prerequisites: Permission of Instructor. 1 hour.

679. **Computer Graphics Research Project**. Can only be taken as part of a specialization in Computer Graphics. Pass/Fail. Prerequisites: Permission of Instructor. 3 hours.

680. **Numerical Computing**. Matrix computations and matrix analysis, including solution of linear systems, least squares, spectral analysis, and singular value decomposition. Applications such as principal component analysis and PageRank. Prerequisites: CIS graduate standing and permission of instructor. 3 hours.

681. **Simulation Models and Animations**. Model development using popular simulation languages, e.g., Excel or OpenOffice.org Calc Spreadsheet; interfacing to an animation system such as Proof Animation or Open_GL. Prerequisites: Graduate Standing. 3 hours.

682. **Simulation Methodology and Applications**. Combined continuous and discrete simulation, simulation theory, modeling environments. Prerequisites: Graduate Standing. 3 hours.

688. **Shape Modeling Seminar**. Prerequisites: Permission of Instructor. 1 hour.

690. **Special Topics**. Prerequisites: Permission of Instructor. 1-3 hours.

691. **Special Topics**. Prerequisites: Permission of Instructor. 1-3 hours.

692. **Special Topics**. Prerequisites: Permission of Instructor. 1-3 hours.

693. **Special Topics**. Prerequisites: Permission of Instructor. 1-3 hours.

694. **Special Topics**. Prerequisites: Permission of Instructor. 1-3 hours.

697. **Directed Readings**. Prerequisites: Permission of Instructor and Graduate Program Director. 1-3, 6 hours.

698. **Masters Plan II**. (Plan II) Pass/Fail. Prerequisites: Permission of Graduate Program Director. 2, 3, 5, 6, 9 hours.

699. **Masters Thesis Research**. Pass/Fail. Prerequisite: Admission to candidacy. 1-6 hours.

700. **Topics in Programming Language Semantics**. Context-sensitive and semantic aspects of programming languages, denotational semantics, mathematical foundations.Prerequisites: Graduate Standing. 3 hours.

701. **Topics in Program Verification**. Proving properties of programs, termination and correctness, computability and decidability, role of formal methods in software design. Prerequisites: Graduate Standing. 3 hours.

702. **Topics in Compiler Design I**. Lexical and syntactical scan, semantics, code generation and optimization, dataflow analysis, parallelizing compilers, automatic compiler generation. Prerequisites: Graduate Standing. 3 hours.

703. **Topics in Compiler Design II**. Advanced topics in compiler design. Prerequisites: Graduate Standing. 3 hours.

708. **Topics in Programming Languages Seminar**. Lectures & discussion on advanced topics in Programming Languages. Prerequisites: Graduate Standing. 3 hours.

710. **Topics in Database Systems**. This course offers an introduction to the advanced topics of database management systems. The following topics are addressed: System and file structure, efficient data manipulation using indexing and hashing, query processing, crash recovery, concurrency control, transaction processing, database security and integrity, distributed databases. Prerequisites: Graduate Standing . 3 hours.

711. **Topics in Database Systems**. Relational, hierarchical, and network models; object-oriented databases, knowledge-based systems; security issues, concurrency control and distributed databases, query optimization; advanced topics. Prerequisites: Graduate Standing. 3 hours.

712. **Topics in Knowledge-Base Systems**. Logic model for deductive databases, top-down and bottom-up evaluation, conjunctive and disjunctive queries, recursion, query optimization, universal relation model. Prerequisites: Graduate Standing. 3 hours.

713. **Topics in Object-Oriented Database Systems**. Object data model, object-oriented query languages and database architecture, schema evolution, integration with non-object-oriented models, query optimization. Prerequisites: Graduate Standing. 3 hours.

714. **Topics in Distributed Database Systems**. Distributed DBMS architecture, query decomposition and data localization, distributed query optimization, transaction management, concurrency control, multidatabase systems. Prerequisites: Graduate Standing. 3 hours.

715. **Topics in Multimedia Database**. This course introduces the principles of multimedia databases including multimedia information processing, modeling, and retrieval. The media to be considered include text, image, audio and video. At the conclusion of this course, the students should understand what multimedia data retrieval is, the principles, which allow the location of relevant information from amongst a large corpus of multimedia data, and the applications of multimedia information retrieval. The students should also have the expertise and competence to design and implement retrieval software for multimedia data. Prerequisites: Graduate Standing. 3 hours.

718. **Database Systems Seminar**. Lectures and discussion on advanced topics in Database Systems. Prerequisites: Graduate Standing. 3 hours.

720. **Topics in Advanced Software Engineering.** Advanced topics in software design, including: Software modularization, design patterns, formal methods, and software testing. Prerequisites: Graduate Standing. 3 Hours.

722. **Topics in Reflective and Adaptive Systems**. This course examines the principles of compile-time and run-time adaptation in several contexts, including: reflection, metaprogramming, aspect-oriented software development, and metamodeling (applied to model-driven engineering). Prerequisites: Graduate Standing. 3 Hours.

724. **Topics in Formal Specification of Software Systems**. Formal methods for software requirements specification, including VDM, Z, and object-oriented extensions; the relationship among formal requirements, design, and implementation. Prerequisites: Graduate Standing. 3 hours.

725. **Topics in Computer System Performance Analysis**. Computer Systems addressed in this course primarily are web based systems and capacity planning is a principal theme. However, the queueing theory and statistical analysis approaches are applicable to conventional computing systems and, in fact, modeling of these latter constitute relevant background information that is developed and exploited for web systems analysis. Prerequisites: Graduate Standing. 3 hours.

728. **Software Engineering Seminar**. This is a special topics class that meets once a week to study new research ideas emerging in the area of software engineering. Prerequisites: Graduate Standing. 3 hours.

730. **Topics in Computer Systems**. Introduction to computer architecture, including memory subsystems, direct-mapped and set-associative cache and multi-level cache subsystems, direct-access devices including RAID and SCSI disk drives, processor pipelining including super-scalar and vector machines, parallel architectures including SMP, NUMA and distributed memory systems, Interrupt mechanisms, and future microprocessor design issues. Prerequisites: Graduate Standing. 3 hours.

731. **Topics in Distributed Computing**. Object-oriented distributed systems design, distributed software architecture, data and resource access, communication, client-server computing, web technologies, enterprise technologies. Prerequisites: Graduate Standing. 3 hours.

732. **Topics in Parallel Computing**. Overview of parallel computing hardware, architectures, & programming paradigms; parallel programming using MPI, Ptureads, and OpenMP; design, development, and analysis of parallel algorithms for matrix computations, FFTs, and Sorting. Prerequisites: Graduate Standing. 3 hours.

733. **Topics in Grid Computing**. Motivation for developing and using Grid Computing, the evolution of Grid Computing, and relationship between Grid Computing and other types of computing such as Cluster Computing, Distributed Computing, Internet Computing, and Peer-to-Peer Computing. Study technologies and architectures used to develop Grids. Prerequisites: Graduate Standing. 3 hours.

734. **Virtualization**. Theory and practice of virtualization. Origins, history, technical and economic motivations. Relationship to network operating systems and operating system architecture. Simulation, Emulation, Virtualization of CPUs, networks, storage, desktops, memory, devices, and combinations thereof. Different approaches to virtualization, including hardware assists and software-only techniques. Techniques, approaches, and methodologies for scale-out and scale-up computing, including security, performance and economic concerns. Prerequisites: Graduate Standing. 3 hours.

736. **Topics in Computer Security**. Study of computer security including assurance, authorization, authentication, key distribution, encryption, threats including phishing and key logging, and related distributed computing issues. Theory and practical applications. Prerequisites: Graduate Standing. 3 hours.

738. **Computer Systems Seminar**. Prerequisites: Graduate Standing. 3 hours.

738A. **Computer Systems Seminar**. Prerequisites: Graduate Standing. 3 hours.

738B. **Computer Systems Seminar**. Prerequisites: Graduate Standing. 3 hours.

739. Topics in Distributed Computing Research. 3 hours.

740. **Topics in Bioinformatics I**. Introduction to computational methodologies in bioinformatics. Prerequisites: Graduate Standing. 3 hours.

741. **Topics in Bioinformatics II**. Introduction to computational methodologies in bioinformatics. Prerequisites: Graduate Standing. 3 hours.

747. **Topics in Biomedical Modeling**. Modeling from biomedical datasets. Construction and analysis of anatomical models; segmentation; morphometry; registration; medical illustration; surgical planning. Prerequisites: Graduate Standing. 3 hours.

748. **Topics in Bioinformatics Seminar**. Lectures & discussion on topics in Bioinformatics. Prerequisites: Graduate Standing. 3 hours.

750. **Topics in Automata Theory**. Formal grammars and automata, Turing machines, computability and decidability, computational complexity, intractability. Prerequisites: Graduate Standing. 3 hours.

751. **Topics in Formal Language Theory**. Parsing and translation theory, formal syntax, proof properties and complexity measures. Prerequisites: Graduate Standing. 3 hours.

752. **Topics in Design and Analysis of Algorithms**. Algorithms for bioinformatics applications, especially string matching algorithms. Also, traditional algorithmic techniques, such as greedy algorithms, dynamic programming, and branch and bound. Prerequisites: Graduate Standing. 3 hours.

753. **Topics in Computational Geometry**. Basic methods and data structures, geometric searching, convex hulls, proximity, intersections. Prerequisites: Graduate Standing. 3 hours.

758. **Theoretical Foundations Seminar**. Lectures & discussion on topics in Theoretical Foundations. Prerequisites: Graduate Standing. 3 hours.

760. **Topics in Artificial Intelligence**. Programming methodologies, logic foundations, natural language applications, expert systems. Prerequisites: Graduate Standing. 3 hours.

761. **Topics in Expert Systems**. Concepts and architectures, tools, reasoning, evaluations, selected examples. Prerequisites: Graduate Standing. 3 hours.

762. **Topics in Natural Language Processing**. Syntax, semantics, ATNs, logic grammars, language and memory. Prerequisites: Graduate Standing. 3 hours.

763. **Topics in Knowledge Discovery & Data Mining**. Techniques used in data mining (such as frequent sets and association rules, decision trees, Bayesian networks, classification, clustering), algorithms underlying these techniques, and applications. Prerequisites: Graduate Standing. 3 hours.

764. **Topics in Knowledge Representation**. Logic, production systems, semantic nets, frames, multiple representational systems. Prerequisites: Graduate Standing. 3 hours.

765. **Topics in Neural Networks**. Theoretical fondations, associative memory, pattern processing, biological neural nets. Prerequisites: Graduate Standing. 3 hours.

766. **Games and Puzzles Seminar**. Interfaces and Engines for games and puzzles such as Chess, Checkers, Othello, Rubik's Cube, Go, Sudoku, etc.

768. **Artificial Intelligence Seminar**. Lectures & discussion on advanced topics in Artificial Intelligence. Prerequisites: Graduate Standing. 3 hours.

770. **Topics in Computer Graphics**. Graphics architectures, geometric transforms, 3-D, object models, shading, intensity, hidden elements, color, advanced topics. Prerequisites: Graduate Standing. 3 hours.

771. **Topics in Shape Design**. This course covers various aspects of the design of shape models. These models are used in computer graphics, automobile and aircraft design, robotics, anatomical modeling, and many other disciplines. Point clouds, meshes, Bezier and B-spline curves and surfaces, implicits, subdivision surfaces, interpolation, intersection, building geometry from images. Prerequisites: Graduate Standing. 3 hours.

772. **Topics in Motion Design**. The description of a motion is important in robotics, computer animation, game design, and many other disciplines. This course covers various aspects of motion design. Position control, orientation control, camera control, motion planning, collision detection, swept surfaces, visibility analysis. Prerequisites: Graduate Standing. 3 hours.

773. **Topics in Computer Vision**. Image understanding feature extraction, domain-specific knowledge for high-level vision. Prerequisites: Graduate Standing. 3 hours.

775. **Topics in Computer Visualization**. Advanced Computer Graphics techniques aimed at "Scientific Visualization" applications. Prerequisites: Graduate Standing. 3 hours.

776. **TPS in Structure from Motion**. Structure from motion extracts geometric information from a series of images of an object, either still photographs or video streams. The position of the camera may also be computed, yielding camera paths. This topic has powerful applications in many areas, including computer graphics, computer vision, photography, visualization, and video augmentation. Projective geometry, multiple view geometry, feature extraction. Prerequisites: Graduate Standing. 3 hours.

778. **Graphics and Image Processing Seminar**. Lectures & discussion on advanced topics in Graphics and Image Processing. Prerequisites: Graduate Standing. 3 hours.

780. **Topics in Numerical Computing Foundations**. Matrix computations and matrix analysis, including solution of linear systems, solution of nonlinear systems, spectral analysis, quadrature, and least squares. Prerequisites: Graduate Standing. 3 hours.

781. **Topics in Simulation Models and Animations**. Model development using popular simulation languages, e.g., Excel or OpenOffice.org Calc Spreadsheet; interfacing to an animation system such as Proof Animation or Open_GL.Prerequisites: Graduate Standing. 3 hours.

782. **Topics in Simulation, Methodology, and Application**. Combined continuous and discrete simulation, simulation theory, modeling environments. Prerequisites: Graduate Standing. 3 hours.

788. **Topics in Shape Modeling Seminar**. Lectures & discussion on advanced topics in shape modeling. Prerequisites: Graduate Standing. 3 hours.

790. **Special Topics**. Selected Topics in Computer Science. Prerequisites: Graduate Standing. 3 hours.

791. **Special Topics**. Selected Topics in Computer Science. Prerequisites: Graduate Standing. 3 hours.

792. **Special Topics**. Selected Topics in Computer Science. Prerequisites: Graduate Standing. 3 hours.

793. **Special Topics**. Selected Topics in Computer Science. Prerequisites: Graduate Standing. 3 hours.

794. **Special Topics**. Selected Topics in Computer Science. Prerequisites: Graduate Standing. 3 hours.

796. **Directed Readings and Research**. Selected readings, research and project development under direction of a faculty member. Must have permission of instructor and graduate program director. Prerequisites: Permission of Instructor. 1-6 hours.

799. **Dissertation Research**. Pass/Fail. Prerequisite: Admission to candidacy. 1-6, 9 hours.

Computer Forensics and Security Management (MSCFSM)

Program Contact Information

Program Co-Directors:
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Program Information

The Master of Science in Computer Forensics and Security Management (MSCFSM) is an interdisciplinary professional practice graduate program involving faculty from the Departments of Computer & Information Sciences and Justice Sciences (College of Arts and Sciences), and the Departments of Management, Information Systems Quantitative Methods, and Accounting & Finance (School of Business). The program prepares graduate students with backgrounds in criminal justice, computer and information sciences, information systems, information technology, and forensic accounting to practice in the fields of computer forensics and security management including information security and forensic accounting. The program develops required skills, including familiarity with industry practices, innovative methods, critical thinking, and problem solving that are crucial for competitiveness and success in entry- or advanced-level positions in the areas of computer forensics, information security management, and forensic accounting. The program is designed to increase the pipeline of prospective, high-quality, entry- and advanced level employees involved with protecting physical and virtual systems vital to the U.S. whose incapacitation or destruction would have debilitating effects on national security and/or the nation's economic system. The program also provides current public and private sector employees an opportunity to obtain advanced high-quality training in the core areas of computer forensics, information security management, and forensic accounting, to facilitate career advancement.

The program is modeled after traditional MBA programs, which includes a core curriculum and one or more areas of specialization. In the program, students complete a core curriculum which includes courses in computer forensics/cybercrime investigation, information security management, and ethics. Students then choose a specialization in either computer forensics/cybercrime investigation or fraud examination, both of which include a field practicum (internship) with an appropriate public or private sector agency or organization.

Faculty

Anthony Barnard, Professor (Computer and Information Sciences), Networks and Network Security;

John Grimes, Assistant Professor (Justice Sciences), Cyber-Intelligence, Open-Source Intelligence, Criminal Law and Procedure

Allen Johnston, Associate Professor (Management, Information Systems, and Quantitative Methods), Information Assurance and Computer Security; Privacy

Julio Rivera, Associate Professor (Accounting and Finance), Forensic Accounting, IT Auditing; Fraud

Tommie Singleton, Associate Professor (Accounting and Finance), Forensic Accounting; Information Technology Audits; Fraud

Anthony Skjellum, Professor and Chair, Co-Program Director (Computer and Information Sciences), High-Performance Computing; Information Security; Cybercrime

John Sloan, Professor and Chair, Co-Program Director (Justice Sciences), Ethics; Cybercrime and Victimization; Research Methods

Thamar Solorio, Assistant Professor (Computer and Information Sciences), Natural Language Processing; Cybercrime

Gary Warner, Instructor and Director of Research in Computer Forensics (Computer and Information Sciences/Justice Sciences), Computer Forensics; Cybercrime Investigation; Information Security

Molly Wasko, Associate Professor and Chair, Co-Program Director (Management, Information Systems, and Quantitative Methods), Information Security Management, Incident Response, Risk Management and Business Continuity.

Sallie Wright, Instructor (Information Technology) Information Assurance and Security

Admission Requirements

Students accepted into the program will have graduated with a baccalaureate degree from a regionally accredited college or university or recognized university from abroad. Most students accepted into the program will have achieved a minimum overall undergraduate grade point average (GPA) of 3.0 on a 4.0 scale and will have earned a combined score of 305 or higher on the verbal and quantitative sections of the Graduate Record Examination (GRE) or a total score of 550 or higher on the Graduate Management Aptitude Test (GMAT). An Admissions Committee consisting of the Program Directors and a minimum of 2 affiliated faculty members will screen applicants and make recommendations to the UAB Graduate School for admission into the program.

Students seeking admission to the program will be accepted from undergraduate programs including criminal justice, computer science, electrical and computer engineering, MIS, IT, business, accounting, as well as other science and social science fields. Students seeking admission to the program, regardless of specific undergraduate preparation, will have had formal exposure to the core areas of computer forensics – including cybercrime and its investigation; IT auditing/forensic accounting; fundamentals of computer and Internet literacy, probability and statistics, computer programming, networking, logic, and discrete mathematics/logic, and information security management. Students lacking requisite backgrounds but who meet other admission requirements may be admitted on a contingency basis and required to take a series of prerequisite courses – potentially including courses in computer programming, accounting, and law – that allow them to develop the necessary backgrounds to be successful in the program. These courses may include the following (or their equivalent): IS204 (Intro to Business Programming)/CS 201 (Intro to Object Oriented Programming); CS250 (Discrete Structures); AC200/201 (Principles of Accounting I & II); AC304 (Accounting Information Systems).

Degree Requirements

A total of 36 semester hours are required for the degree, including 24 hours of required courses and 12 hours of electives in one of two tracks: Cybercrime and Computer Forensics or Fraud Examination. Students are also required to complete a field practicum.

The core curriculum includes IS577– Information Security Management, JS530– Ethics and Computer Forensics, JS504 – Introduction to Computer Forensics, JS675 – Law, Evidence & Procedure, CS534 – Internetworking & Intranets, CS536 - Network Security, CS636 – Computer Security, and CS591 – Special Topics in Organizational Information Assurance (CISSP Training). The Computer Forensics/Cybercrime Investigation track includes the following courses: CS516 – Digital Documents, Security & Intellectual Property, CS537 – Cybercrime & Forensics, CS591 – Investigating Online Crime, and CS599 – CyberCrime Practicum. The Fraud Examination track includes the following courses: AC572 – Forensic Accounting & IT Audit, AC573 – Fraud Examination, LS571 – Expert Witness & Litigation Support, and AC574 – Forensic Accounting Practicum.

Course Descriptions

AC572 - Forensic Accounting & Information Technology Auditing. Key legal principles and courtroom procedures relevant to forensic accounting, and survey of related topics - criminology theories, evidence management, and litigation services. *Hours Credit: 3.*

AC573 - Fraud Examination. Forensic accounting concepts with a primary focus on occupational fraud and abuse - its origins, perpetration, prevention, and detection. Course covers some of the material found on Certified Fraud Examiner (CFE) certification exam. *Hours Credit: 3. Prerequisite: AC572*

AC574 – Forensic Accounting Practicum. Work-related experience in a private, public, or government organization enhancing the applications of forensic accounting theories and concepts. *Hours Credit: 3. Prerequisite: AC573.*

CS514 - Digital Documents, Security & Intellectual Property. Concepts in digital documents, provenance, digital forgery, steganography, and the digital millennium copyright act are key aspects of this course. *Hours Credit: 3*.

CS516 - Organizational Information Assurance. Information assurance in organizational settings, including prevention, detection, response to threats, and subdomains and their interactions. *Hours Credit: 3*.

CS517/JS515 - Investigating Online Crime. Introduction to cyber-investigative techniques involving focused analysis of email and websites and examination of legal processes and preparation of digital evidence. *Hours Credit: 3*.

CS518 - Computer Forensics Practicum. Internship placement with law enforcement agency or corporate partner-. *Hours Credit: 3-6*.

CS534 - Internetworking & Intranets. Underlying network technology including interconnecting networks using bridges and routers, IP addresses and datagram formats, static and dynamic routing algorithms, control messages, subnet and supernet extensions. UDP and TCP file transfer protocols, email, network address translation and firewalls. Weekly Linux-based lab. *Hours Credit: 3*.

CS536 – Computer Network Security. Conventional and public-key cryptography. Message encryption and authentication. Secure communication between computers in a hostile environment, including E-mail (PGP), virtual private networks (IPSec) and the World Wide Web (SSL). Mandatory weekly Linux-based lab. *Hours Credit: 3*.

CS537 - Cybercrime & Forensics. Overview of all aspects of media forensics including analysis of character encoding, file formats and digital media, examination of disk acquisition and duplication techniques and application of these techniques in criminal investigations scenarios. *Hours Credit: 3*.

CS636 - Computer Security. Study of computer security including assurance, authorization, authentication, key distribution, encryption, threats including phishing and key logging, and related distributed computing issues. Theory and practical applications. *Hours Credit: 3*.

CS591 - Special Topics in Organizational Information Assurance (CISSP Training). Preparation for Certified Information Systems Security Professional examination. *Hours Credit: 3*.

IS577 - Information Security Management. Provides students with a strong foundation in key security management issues, including: an understanding of key concepts and how people, technology and organizational policies should be developed and managed to safeguard an information resources. *Hours Credit: 3* .

JS530 - Ethics and Computer Forensics. Overview of systems of ethics with application of core principles to issues relating to cyberinvestigation, computer forensics, and related areas. *Hours Credit: 3*.

JS502 - Introduction to Computer Forensics. Analytical and investigative techniques in criminal or civil litigation to identify, collect, examine and preserve evidence/information magnetically stored or encoded. *Hours Credit: 3*.

JS675 - Law, Evidence & Procedure. Overview and examination of the legal aspects of physical evidence including rules of evidence, procedural rules, and the role of expert witnesses; moot court component. *Hours Credit: 3*.

LS571- Expert Witness & Litigation Support. Principles of law related to forensic accounting, including forensic evidence, and expert witnesses. The course content covers some material found on the Certified Fraud Examiner (CFE) certification exam. *Hours Credit: 3.*

Criminal Justice (M.S.C.J.)

Degree Offered:M.S.C.J.

Director: *Copes*

Phone: (205) 934-2069

E-mail: jhcopes@uab.edu

Web site: http://www.uab.edu/justice-sciences/

Faculty

Heith Copes, Associate Professor (Justice Sciences); Qualitative Methods; Criminal Decision Making; White Collar Crime; Police

Martha Earwood, Teaching Assistant Professor (Justice Sciences)

Elizabeth Gardner, Assistant Professor (Justice Sciences)

John Grimes, Teaching Assistant Professor (Justice Sciences)

Kent Kerley, Associate Professor (Justice Sciences); Policing; White-Collar Crime; Criminal Justice Policy

Jason Linville, Assistant Professor (Justice Sciences)

Shelley McGrath, Assistant Professor (Justice Sciences); Research Methods, Statistics

Kathryn D. Morgan, Associate Professor (Justice Sciences); Corrections; Criminological Theory; Minorities

Suzanne Perumean-Chaney, Assistant Professor (Justice Sciences); Statistics, Homicide

John J. Sloan, III, Full Professor and Chair (Justice Sciences); Victimization; Fear of Crime; Criminal Justice Policy; Juvenile Justice; Program Evaluation

Anne Wheeler, Instructor and Pre-Law Program Director (Justice Sciences); Law and Society; Criminal Law

Adjunct Faculty

James Philips, (Adjunct Instructor), Criminal Law, Evidence, and Procedure; White Collar and Corporate Crime

Gary Warner, Instructor (Computer and Information Sciences/Justice Sciences); cybercrime, computer forensics, law enforcement

Program Information

The criminal justice graduate program requires study in the overall discipline, including intensive investigation in the areas of criminal justice policy, criminal justice administration, research methods and statistics, and criminological theory.

Each year, students are admitted to the M.S.C.J. program for the fall term. **The application deadline is June 1.** Students may be admitted to the M.S.C.J. program "in good standing" provided they meet all minimum admission criteria established by the Graduate School **and** have taken an introductory-level statistics and an introductory-level research methods course in which a grade of B or better was earned in

each course. Students who otherwise meet the minimum admission criteria but have not taken one or both of these courses, may be admitted to the M.S.C.J. program on a "contingency" basis. Students so admitted will not be allowed to register for graduate coursework until the contingencies are removed. Students meeting the minimum requirements for admission but lacking a substantive background in criminal justice **may** be admitted to the M.S.C.J. program on a "contingency" basis, but will be required to undertake remedial coursework before they will be allowed to register for any graduate coursework.

Degree Requirements

Plan I (Thesis)

Students selecting the Plan I option must (1) complete a minimum of 30 semester hours (18 of which are the required professional seminars JS 583, 600, 601, 604, 605, and 606); (2) 9 semester hours of electives; and (3) propose and then complete a major research project under the direction of a thesis committee chaired by the student's major advisor (minimum 3 hours of JS 699). Students who select the Plan I option must establish and maintain a minimum GPA of 3.0 in all coursework undertaken (required and elective). Students failing to do so may be dismissed from the program.

Plan II (Non-thesis)

Students selecting the Plan II option must (1) complete a minimum of 36 semester hours in coursework, 21 hours of which consist of the required professional seminars (JS 583, 600, 601, 603, 604, 605, and 606); (2) 12 semester hours of electives (3 hours of internship is strongly recommended); (3) and (4) write a “Demonstration Project” in their area of substantive interest (3 hours JS 697). The demonstration project provides evidence of the student’s proficiency in the core areas of research methods, statistics, and criminal justice policy. This research paper is done under the guidance of the student's advisor. The student will prepare and submit this research paper to his/her advisor. Students who select the Plan II option must establish and maintain a minimum GPA of 3.0 in all coursework undertaken (required and elective). Students failing to do so may be dismissed from the program.

Financial Aid

Students who are admitted to the M.S.C.J. program "in good standing" are eligible to receive department-based financial aid in the form of research assistantships or scholarships that are awarded on a competitive basis. Students are typically notified of such awards in early June of each year for the following fall.

Additional Information

Deadline for Entry Term(s):	Fall
Deadline for All Application Materials to be in the Graduate School Office:	June 1
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)

Contact Information

For detailed information contact Dr. Heith Copes, Department of Justice Sciences, University Boulevard Office Building (UBOB) room 215, 1201 University Boulevard, Birmingham, Alabama 35294-4562.

Telephone: 205-934-2069

E-mail jhcopes@uab.edu

Web **www.uab.edu/justicesciences**

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded by an asterisk indicate courses that can be repeated for credit, with stated stipulations.

Criminal Justice (JS)

Required Seminars

583 **Patterns in Crime.** Examination of the major correlates of crime and criminality,including age, race, sex, and socio-economic status, examination of major sources of information from which data on crime correlates are gathered..

593. **Special Projects in Criminal Justice**.

600. **Pro-seminar in Criminal Justice**. Critical analysis of formal and informal processing of offenders by criminal justice agencies, including police, courts, and corrections; effectiveness and future directions.

601. **Seminar in Criminological Theory I.** Analysis of crime patterns and known correlates; theoretical explanations of criminality including classical, biophysiological, psychological, and sociological theories..

603. **Seminar in Criminal Justice Administration**. Theories of organizational structure, motivation, and management applied to criminal justice agencies.

604. **Seminar in Criminal Justice Policy**. Origins, formulation, implementation, and evaluation of criminal justice policy; classic and contemporary examples of policy innovations.

605. **Seminar in Research Design**. Quantitative methods of empirical research emphasizing criminal justice/criminological applications; current research methodologies relating to analysis of issues involving crime and criminal justice.

606. **Seminar in Data Analysis**. Bivariate and multivariate analyses and interpretation of results from substantive research.

Elective Courses

500-504. **Special Topics in Criminal Justice**. Investigation of topics of current interest to faculty members. Topics selected for in-depth analysis are listed each term in class schedule. May be repeated in different topics for a maximum of 12 hours. 3 hours each.

507. **Advanced Criminal Law**. In-depth, case-study examination of substantive criminal law; analysis of acts, mental states, and attendant circumstances constituting various crimes.

540. **White Collar and Corporate Crime**. Introduction to, and analysis of, illegal/deviant behavior occurring in organizational settings, including crimes committed by and against complex organizations.

542. **Race, Crime, Gender and Social Policy**. Examination of how the subordinate status of minority groups (African Americans, Hispanics, Native Americans, and Women) affects interaction with the justice system as offenders, victims, and professionals.

543. **Women and the Criminal Justice System**. Evaluation of the changing role of women in the justice system as victims, offenders and professionals..

544. **Law and Society**. Examination of how law is used to facilitate or regard social change, social control, and social conflict in society..

545. **Juvenile Corrections**. Examination of historical and contemporary efforts to reduce juvenile delinquency with particular attention to innovative programs and evaluation of their effectiveness..

614. **Seminar in Advanced Legal Problems**. Legal theories; criminal law, evidence, and procedure; origins, philosophy, and development of legal system; exposure to legal reasoning.

676. **Adv Bio Method in Forensic Sci**. Legal aspects of physical evidence; role of expert witnesses in criminal process; moot court activities.

*696. **Graduate Internship in Criminal Justice**. Field experience in criminal justice agency setting. May be repeated for a maximum of 6 hours of credit.

*697, 698. **Directed Research**. Independent study in a student's substantive area of interest under the direction of a faculty member.

*699. **Thesis Research**. Prerequisite: Admission to candidacy and successful defense of thesis proposal. 1-6 hours.

English (M.A.)

Degree Offered:	M.A.
Director:	Dr. Gale Temple
Phone:	(205) 934-8593
E-mail:	**gtemple@uab.edu**
Web site:	**www.uab.edu/english**

Faculty

Rebecca A. Bach, Professor (English); Shakespeare, Renaissance Drama

Jeffrey Bacha, Assistant Professor (English); Rhetoric and Composition, Professional and Technical Communication

David A. Basilico, Associate Professor (English); Linguistic Theory, Syntax and Semantics, Cognitive Science

Peter J. Bellis, Professor and Chair (English); American Literature

Mary Flowers Braswell, Professor (English); Chaucer, Medieval Studies, Fourteenth-Century English, Arthurian Legend, Bibliography

James Braziel, Assistant Professor (English); Creative Writing, Poetry, Science Fiction

Alison Chapman, Associate Professor (English); Renaissance Poetry and Prose

Lila Graves, Associate Professor (English); Prose Fiction, Eighteenth-Century British Literature

Kyle Grimes, Associate Professor (English); British Romanticism, Eighteenth- and Nineteenth-Century English Literature, Electronic Textuality, Bibliography

William Hutchings, Professor (English); Modern British Fiction, Modern Drama, World Literature

Kerry Madden-Lunsford, Assistant Professor (English); Writing for Young People, Creative Nonfiction, Fiction

Bruce McComiskey, Professor (English); History and Theory of Rhetoric, Discourse Analysis, Composition

Christopher Minnix, Assistant Professor (English); Rhetorical Theory, Transnational Rhetoric, Compositions Studies, Writing Program Administration
Kieran Quinlan, Professor (English); American Literature

Cynthia Ryan, Associate Professor (English); Composition, Professional Writing, Public Discourse, Medical Rhetoric

Daniel Siegel, Associate Professor (English); Nineteenth-Century British Literature and Culture, The Novel

Gale Temple, Associate Professor (English); Early American Literature and Culture

Adam Vines, Assistant Professor (English); Creative Writing, Poetry, Twentieth and Twenty-First Century Poetry

Admission Requirements

For admission in good standing, applicants must meet the Graduate School's requirements for scholarship and test scores (GRE General Test or MAT). The applicant should normally have finished the requirements for an undergraduate degree in English, including satisfactory completion of at least six semester hours in a foreign language. A generally well-prepared applicant who is lacking in some part of the undergraduate preparation may be admitted with the provision that any deficiencies be removed by a time specified by the graduate program director.

Program Description

Students in the graduate program can concentrate their studies in any of three areas: Literature, Composition and Rhetoric, or Creative Writing. The requirements for each of these concentrations are explained below.

Concentration in Literature

Most literature courses can be considered to fall into one of the following areas, each of which has its own reading list.

Group I:

British Lit before 1500

British Lit 1500-1660

British Lit 1660-1790

British Lit 1790-1900

British Lit 1900-present

Group II:

American Lit before 1800

American Lit 1800-1900

American Lit 1900-present

African American Lit 1746-present

African Diaspora Lit

Group III:

Composition Pedagogy

Rhetorical Theory

Linguistics

Critical Theory

Concentration in Literature

Plan I.

1. Students who write a thesis must take 3 hours in Bibliography & Methods, 3 hours of linguistics, 6 hours of thesis work, 12 hours of British/American literature, and 6 hours of electives. They must take at least 6 hours in Group I and 6 hours in Group II.

2. 15 hours of course work must be at the 600 seminar level in English. A maximum of 3 of these required 15 hours can be taken as EH 699, Thesis Research.

3. Students must choose a member of the English faculty to chair their Graduate Study Committee (GSC). In consultation with this chair, students must select at least two other faculty members to complete their GSC. All members of the GSC must be graduate faculty. Once constituted, membership of the GSC cannot be changed without the approval of the departmental graduate program committee.

4. Before students can be admitted to candidacy, they must have passed 18 hours of course work and had a thesis proposal accepted by their GSC and the Director of Graduate Studies.

5. Students must pass a Thesis Defense.

Plan II.

1. Nonthesis students must take 3 hours in Bibliography & Methods, 3 hours of linguistics, 12 hours of British/American literature, and 12 hours of electives.

2. 15 hours of course work must be at the 600 seminar level in English.

3. Students must pass individual tests in 5 areas, but 1 of these tests may be replaced by earning a cumulative 3.5 or better G.P.A. in two English graduate courses in one of the listed areas OR by passing two creative writing courses at the 500 level or above.

4. All students must choose at least one test area from each Group.

5. By the time students have earned 24 credit hours toward the M.A., students must secure the agreement of a graduate faculty member to serve as chair of their Graduate Study Committee (GSC). Students are encouraged to secure this faculty mentor as early as possible since the chair of a student's GSC has primary responsibility for mentoring the student through the exam process. The Committee chair must coordinate the composition, administration, and evaluation of all area tests for that student. The chair is also responsible for informing the student (and graduate program director) of the criteria for evaluation of the subject area tests; for notifying the student of the results; and for meeting with the student afterwards to review the tests. The chair is also responsible for keeping the graduate program director informed of the student's progress and maintaining a complete exam file on the student.

6. In consultation with the student and the graduate program director, the Committee chair will appoint at least three other faculty to serve on the student's GSC. All members of the GSC must be graduate faculty. Once constituted, membership of the GSC cannot be changed without the approval of the departmental graduate program committee.

7. Each two-hour area test must follow a standard format that allows students to demonstrate their ability to read closely and to synthesize ideas.

a. Area tests in literature and critical theory will give the following instructions based on selections from the area reading list:

Choose one of the following passages and write an essay that (1) establishes–based on the chosen passage–some significant literary, intellectual, and/or cultural context and presents a thesis having to do with that context; (2) explains, by a close reading of the text, why the chosen passage is important both to the work from which it is taken and to the thesis of the present essay; and (3) discusses the context and thesis in relation to at least two other works from the area reading list.

b. Area tests for Composition Pedagogy or Rhetorical Theory will give the following instructions based on selections from the area reading list:

Choose one of the following passages or set of passages and write an essay that (1) indicates your understanding of the passage(s) and the work from which it is taken; (2) identifies and explains the specific issues in rhetorical theory or composition pedagogy that are addressed by or related to the selection(s); and (3) discusses these issues in a broader context by drawing on at least two other works from the area reading list.

c. See the Director of the Linguistics Program for a sample area test in Linguistics.

8. Students must provide their GSC with a minimum of three weeks' notice in scheduling area tests, which must be taken Monday-Friday during the tenth week of each semester (sixth week during the shortened summer term).

9. Students are limited to three attempts at passing a test for the same area.

10. The GSC will hold a group grading session to evaluate individual tests as Failing, Passing, or High Pass (the latter designation must be a unanimous decision of the GSC). If a student earns four High Passes, this student will be passed "With Distinction."

11. There is no oral examination for nonthesis students.

Concentration in Composition/Rhetoric

Plan I.

1. Students who write a thesis must take 3 hours in Bibliography & Methods of Research, 3 hours of linguistics, 9 hours of literature electives, 6 hours of thesis research, 3 hours of rhetorical theory, and 6 additional hours of courses in the areas of Rhetorical Theory, Composition Pedagogy, or Professional Writing (total of 30 hours).

2. 15 hours of course work must be at the 600 seminar level in English. A maximum of 3 of these required 15 hours can be taken as EH 699, Thesis Research.

3. Students must choose a member of the Composition/Rhetoric faculty to chair their Graduate Study Committee (GSC). In consultation with this chair, students must select at least two other faculty members to complete their GSC. All members of the GSC must be graduate faculty and at least one (in addition to the chair) should be another composition/rhetoric specialist. Once constituted, membership of the GSC cannot be changed without the approval of the departmental graduate program committee.

4. Before students can be admitted to candidacy, they must have passed 18 hours of course work and had a thesis proposal accepted by their GSC and the Director of Graduate Studies.

5. Students must pass a Thesis Defense.

Plan II.

1. Nonthesis students must take 3 hours in Bibliography & Methods of Research, 3 hours of linguistics, 9 hours of literature electives, 3 hours of rhetorical theory, and 12 additional hours of courses in the areas of Rhetorical Theory, Composition Pedagogy, or Professional Writing (total of 30 hours).

2. Guidelines 2-11 under Concentration in Literature, Plan II, apply to these students.

Concentration in Creative Writing (Plan I only)

1. Creative writing students are required to take 12 hours of creative writing workshop courses, 6 hours of thesis research, 9 hours of literature, and 3 hours of English electives.

2. 15 hours of course work must be at the 600 seminar level in English including at least one section of a 600-level creative writing workshop. A maximum of 3 of these required 15 hours can be taken as EH 699, Thesis Research.

3. Students must choose a member of the Creative Writing faculty to chair their Graduate Study Committee (GSC). In consultation with this chair, students must select at least two other faculty members to complete their GSC. All members of the GSC must be graduate faculty and at least one (in addition to the chair) should be another creative writing specialist. Once constituted, membership of the GSC cannot be changed without the approval of the departmental graduate program committee.

4. Before students can be admitted to candidacy, they must have passed 18 hours of course work, including at least 3 hours in creative writing, and had a thesis proposal accepted by their GSC and the Director of Graduate Studies.

5. Students must pass a Thesis Defense.

Additional Information

Deadline for Entry Term(s):	Each semester
Deadline for All Application Materials to be in the Graduate School Office:	Six weeks before term begins
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE or MAT (TOEFL and TWE also required for international applicants whose native language is not English.)

For detailed information, contact Dr. Gale Temple, Graduate Program Director, Department of English HB 220, 1530 3rd Avenue South, Birmingham, AL 35294-1260.

Telephone 205-934-8593

E-mail **EnglishGrad@uab.edu**

Web **www.uab.edu/english/grad**

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

English (EH)

501. **Tutoring Writing.** Examines the theory and practice of one-to-one writing instruction.

502. **The Rhetoric of Popular Periodicals.** Explores the production and consumption of magazine discourse.

503. **Business Writing.** Advanced writing focused on letters, resumes, and professional reports.

504. **Technical Writing.** Advanced writing focused on short informal and long formal reports.

505, 506. **Poetry Writing Workshop.** Advanced work in poetry through student's own writing.

507, 508. **Creative Nonfiction Writing Workshop.** Advanced work in creative nonfiction through student's own writing.

509, 510. **Fiction Writing Workshop**. Advanced work in prose fiction through students' own writing.

511. **Novel**. History and techniques of the novel. Authors vary.

512. **Poetry: Lyric and Shorter Forms**. The evolution and generic influences of the small poem in English from the early Renaissance to the present.

513. **Drama**. Techniques and problems of drama, classical through contemporary.

514. **Modern British and European Drama**. Techniques and problems of modern European drama from Ibsen to the present, including works by Chekhov, Shaw, Synge, Brecht, Pinter, and Beckett.

515. **Form of Fiction: The Short Story**. American, Russian, and European short stories, emphasizing aesthetics of form.

516. **Modern American Poetry**. Focus on writers from 1900-1945 such as Frost, Stein, Stevens, Williams, H.D., Pound, Moore, Eliot, Toomer, Crane, and Hughes.

517, 518. **Creative Writing Workshop: Special Projects**. Creative Writing Workshop: Special Projects: Advanced work in creative writing focusing on the student's own writing in unique settings and/or genres.

519. **Young Adult Literature**. Close reading of young adult literature; its form and history, its assumptions about adolescent psychology, and its literary relationship to the traditional canon.

520. **World Literature I (to 1600)**. Survey of monuments mainly in the Western tradition (Sumerian, Hebraic, Hellenic, continental) with emphasis on the epic.

521. **World Literature II (1600 to present)**. Selections in translation from Europe, Africa, South America, and/or Asia and the Pacific.

522. **African Literature**. Selected novels, short stories, autobiographies, folk tales, drama, essays, films, songs from pre-colonial Africa to the present, including works by Emecheta, wa Thiong'o, Head, Achebe, Ba, Armah, Laye, Salih, Soyinka, and Abrahams.

523. **African Women's Literature**. Writing in all genres by African women from pre-colonial Africa to the present.

524. African-American Special Topics.

525. Pre-1700 Literature Special Topics.

526. 1700-1900 Literature: Special Topics.

528. English Elective: Special Topics.

529. Creative Writing: Special Topics.

531. **Special Topics in Film**. In-depth study of a specialized topic in film, for example, a particular national cinema, one or more directors, a development in film history or genre, or issues in visual representation.

535. **Teaching Creative Writing**. A practical exploration of creative writing pedagogy through workshops and lesson-planning exercises.

537. **Writing Children's Literature**.

541. **Literary Theory and Criticism: The Ancients to the Nineteenth Century**. Introduction to the theories of art and literary production in the contexts of aestheics and culture from Plato to the end of the nineteenth century.

542. **Literary Theory and Criticism. The Twentieth Century to the Present**. Introduction to the major schools of literary theory and criticism since the beginning of the twentieth century. Topics will include Russian formalism and New Criticism; structuralism, post-structuralism, and deconstruction; reader-response criticism; narrative theory; psychoanalytic theory; Marxist criticism; new historicism and cultural studies; feminist criticism and queer theory; postcolonial and ethnic studies; and postmodernism.

543. **Archetype and Myth**. Recurring images, underlying patterns, and shapes-of-meaning in poetry, fiction, and fairy tales.

544. **Women's Literature and Theory**. Literary works and theoretical perspectives of Angelou, Chopin, Hong Kingston, Hurston, Walker, Woolf, Plath, and others.

545. **Special Topics in African American Studies**. Literary and theoretical explorations of a specific topic.

546. **African American Autobiology**. Personal narratives by African Americans, including texts by Wheatly, Douglass, Jacobs, Wilson, DuBois, Johnson, Hurston, Hughes, Wright, Baldwin, Angelou, and Moody.

547. **African American Drama**. Development of African American dramatic tradition from the nineteenth century through the Harlem Renaissance and Black Arts movement to contemporary postmodernism, including such playwrights as Brown, Hurston, Baraka, Sanchez, Wilson, and Parks.

548. **African American Poetry**. Development of African American poetry from early works to the present, including such poets as Wheatley, Dunbar, Hughes, Brooks, Alexander, Dove, and Angelou.

550. **Advanced Grammar**. Present-day English grammar.

551. **Generative Grammar**. Advanced analysis of English grammar with emphasis on Chomskyan generative grammar. Prerequisite: permission of instructor.

552. **Grammar and Usage for English Teachers**. Intensive review of the structure of English; emphasis on usage, punctuation, and style as these relate to grammar.

553. **Advanced History of the English Language**. Advanced topics.

554. **The Biology of Language**. Vocal tract and neuroanatomical specializations for language, language acquisition, genetic language disorders, language and other primates, and the evolution of language.

557. **Writing and Medicine**. Public discourse focusing on health, illness, and medical practice. Production of texts as health consumers and health practitioners.

559. **Discourse Analysis**. Public discourse, with emphasis on social politics of linguistic choices.

560. **American Women Writers Before 1900**. Survey of American women's writing before 1900.

561. **American Literature Before 1820**. Representative American writing from the colonial period to the early 1820s.

562. **American Literature, 1820-1870**. Representative writers such as Alcott, Dickinson, Douglass, Emerson, Fern, Fuller, Hawthorne, Jacobs, Melville, Poe, Stowe, Thoreau, and Whitman.

563. **American Literature, 1870-1914**. Representative writers such as Twain, James, Howells, Crane, Jewett, Wharton, Dreiser, Norris, Chopin, and others.

564. **American Literature, 1914-1945**. A study of some of the main texts from the period by writers such as O'Neill, Frost, Stein, Stevens, Eliot, Cather, Hemingway, Larsen, Fitzgerald, Hughes, Faulkner, and Wright.

565. **American Literature 1945-Present**. Selected fiction, poetry, and drama in the context of postwar cultural trends and literary movements.

566. **The Slave Narrative and its Literary Expressions**. Representative writers from Gustavus Vassa to Alice Walker, with emphasis on periods and movements.

567. **Black Women Writers**. Evolution of the Afrocentric feminist consciousness through early and contemporary writings.

568. **The Harlem Renaissance**. Black writers during Harlem Renaissance movement. Includes Johnson, Toomer, Murray, Larsen, McKay, Thurman, Reed, and Morrison.

569. **Medieval Culture: Literature and Society**. Exploration through art, literature, and history of the dominant themes of the English Middle Ages.

570. **Arthurian Legend**. King Arthur and his knights in literature from 6th-century history and formulation of the legend in the Middle Ages to its use in the 20th century.

571. **Beowulf in Context**. An interdisciplinary course in Anglo-Saxon art and culture bearing upon *Beowulf*; close study of the Norse analogues of the Old English epic.

573. **Chaucer: Pilgrimage to Canterbury**. Selections from Canterbury Tales and the 14th-century milieu.

574. **English Renaissance Drama Excluding Shakespeare**. Survey of the Elizabethan and Jacobean theater. Authors vary, but may include Jonson, Webster, Dekker, and Heywood.

575. **English Renaissance Poetry and Prose**. Focus varies from broad survey of period to close analysis of genre, theme, or author.

576. **Shakespeare**. Intensive study of seven plays, focusing on the interactions between culture and the theater.

578. **Age of Milton**. Selected prose and poetry, including Paradise Lost.

580. **The Restoration**. Dryden, Butler, Rochester, Marvell, Bunyan, Congreve, Wycherley, and Etherege.

581. **The Eighteenth Century: Literature and Culture**. An interdisciplinary exploration of texts that focuses on social, economic, and political backgrounds of selected texts from the period. Authors and topics vary.

582. **The Eighteenth Century: Theory and Interpretation**. An interdisciplinary exploration that focuses on the formal and philosophical implications of selected texts. Authors and topics vary.

583. **British Romanticism**. Study of works by British writers, 1785-1834. Authors will likely include Blake, Smith, Wordsworth, Coleridge, Byron, P.B. and Mary Shelley, Keats, and others.

585. **British Victorian Poetry**. Study of Tennyson, Browning, the pre-Raphaelites, and others, with a focus on the cultural context of their poetry.

586. **Eighteenth-Century British Novel**. Study of narrative techniques and cultural contexts in eighteenth-century prose fiction. Course explores works written during the long eighteenth century and includes authors in a chronological range extending from Aphra Behn to Sir Walter Scott. Authors and topics vary.

587. **Nineteenth-Century British Novel**. Study of writers like Austen, Dickens, Thackeray, the Brontës, George Eliot and Hardy with an emphasis on the relationship between cultural changes and the development of the novel.

588. **British Novel: The Modern Age**. Study of Conrad, Lawrence, Joyce, Woolf, Ford, and others, focusing on narrative technique and the transformation of traditional literary forms.

589. **James Joyce**. A study of Joyce's writings through *Ulysses*.

*591. **Major Writers**. See class schedule for announcement of subjects. May be repeated for total of 9 hours credit if focus is on different subjects.

597. **Individual Studies**. Prerequisite: proposal must be submitted to the Graduate Director before the last two weeks of the semester preceding the semester in which the student intends to register. 1-3 hours.

600. **Engineering Communication**. Strengthens engineering students' understanding of and application of effective communcations practices in the workplace. Subjects covered include techniques of audience analysis; production of problem/solution formats; analysis and creation of reports, journal articles, and proposals; and presentation of ideas in written and oral formats.

601. **Classical Rhetorical Theory**. Review of rhetoric from classical period through Renaissance with emphasis on the works of Plato and Aristotle.

602. **Modern Rhetorical Theory**. Advanced studies in twentieth-century theories of rhetoric; themes include Marxism, feminism, philosophy, semiotics, and ideology.

603. **Literacy in Communities**. Examines the theory and practice of literacy instruction in varied cultural contexts.

604. **Research Methods in Composition and Rhetoric**. Develops skills in planning and implementing research designs in composition.

610. **Prosody, Poetics, and Close Reading**. Fosters an ability to read poetry closely and analytically; examines traditional descriptions of poetic form and meter; introduces recent work in poetic theory and philosophy of poetic composition.

615, 616. **Seminar: Graduate Poetry Writing Workshop**. Advanced work in poetry through students' own writing.

617, 618. **Seminar: Graduate Creative Nonfiction Workshop**. Advanced work in creative nonfiction through students' own writing.

619, 620. **Seminar: Graduate Fiction Writing Workshop**. Advanced work in prose fiction through students' own writing.

635. **Middle English Literature**. Study of writers other than Chaucer, with a concentration on the writings of the Gawain Poet, the lais and lyrics, and some female writers.

636. **Chaucer**. Emphasis on the importance of Chaucer as a poet, his contributions to literature, and his cultural setting. Canterbury Tales and selected earlier poetry.

637. **English Renaissance Literature**. Topics vary. Analysis of a group of texts within a genre, with a common theme, or by a single author or group of authors, as well as the discursive and social contexts in which these texts were produced.

638. **Eighteenth-Century British Literature**. Analysis of the formal and cultural aspects of 18th-century literature; attention to interdisciplinary aspects of selected texts.

639. **Nineteenth-Century British Literature**. Intensive exploration of a particular aspect of literature and culture from the Romantic or Victorian period. Focus varies.

640. **Twentieth-Century British Literature**. An in-depth examination of selected literary trends in modern English and Irish literature, focusing especially on the critical and/or theoretical frameworks by which these trends were defined. Topics vary.

645. **Bibliography and Methods of Research**. Emphasis on how materials in Sterne Library may be used effectively. Includes computer searching, listserve, and the internet. Field trips to special collections.

646. **Practicum in Teaching Writing**. Theory and practice of teaching writing at the postsecondary level.

647. **Practicum in Tutoring**. English grammar review and effective tutoring strategies. Prerequisites: students must have been awarded an assistantship and be scheduled to tutor in the Writing Center. 1 hour.

648. **Introduction to Old English**. Part one of an in-depth study of Anglo-Saxon English culminating in interpretation of The Dream of the Rood and The Wanderer in the original alliterative verse. Satisfies the M.A. linguistics requirement.

649. **Beowulf**. Part two in the Old English sequence, exploring a few shorter works as well as the epic in close detail. Prerequisite: EH 648.

655. **History of the English Language**.

656. **American Literature, 1620-1820**. Focus on texts reflecting the evolution of American culture from its early colonial period to the early national period.

657. **American Literature, 1820-1870**. Centering on writers from the American Romantic Movement to explore such themes as their use of symbolism, transcendentalism, feminist approaches, or connections with American landscape art.

658. **American Literature, 1870-1914**.

659. **American Literature, 1914-1945**. A study of one or more authors from the following list: O'Neill, Faulkner, Larsen, Frost, Eliot, Stevens.

660. **American Literature, 1945-Present**. Selected postmodern works in the context of U.S. cultural trends and literary movements since the Cold War.

677. **Shakespeare: The Body, Gender, and Sexuality**. Investigates languages of the body, sexuality, and gender in seven plays, as well as historical materials and current criticism and theories of the body.

*690. **Major Writers**. See class schedule for announcement of subjects. May be repeated for total of 9 hours credit if focus is on different subjects.

*693. **Special Topics**. See class schedule for announcement of subjects. May be repeated for total of 9 hours credit if focus is on different subjects.

694. **British Literary Themes from the Middle Ages Through the Early Eighteenth Century**. See class schedule fro topic.

695. **British Literary Themes from Jane Austen to the Present**. Recent themes include effects of industrialism, role of women, the concept of the gentleman, loss of faith, and relation of the artist and audience. Writers vary.

696. **American Literary Themes from the Puritans to the Present**. See class schedule for topic.

698. **Directed Studies**. See the departmental description of the M.A. program for the special restrictions on this course. Prerequisite: Permission of Director of Graduate Studies. 1-3 hours.

*699. **Thesis Research**. Prerequisite: Admission to candidacy and approval of thesis proposal by departmental Graduate Committee. 1-6 hours. May be repeated for a total of 9 hours credit.

Forensic Science (M.S.F.S.)

Degree Offered:	M.S.F.S.
Director:	*Linville*
Phone:	(205) 934-2069
E-mail:	**jglinvil@uab.edu**
Web site:	**www.uab.edu/justice-sciences/**

Faculty

Steve Drexler, Adjunct Faculty; Conventional Criminalistics

Elizabeth Gardner, Assistant Professor

Jay Glass, Adjunct Faculty; Questioned Death Investigation

Curt Harper, Instructor; Forensic Toxicology

Jason Linville, Assistant Professor, MSFS Director

Dan Matteo, Adjunct Faculty; Forensic Drug Chemistry

James Phillips, Adjunct Faculty; Law, Evidence, and Procedure

Mitch Rector, Adjunct Faculty; Conventional Criminalistics

Anthony Skjellum, Professor (Computer and Information Sciences); Computer Forensics

Karen Valencia, Instructor; Forensic Toxicology

Gary Warner, Professor (Computer and Information Sciences); Computer Forensics

Program Information

The Master of Science in Forensic Science program is designed to prepare individuals for careers in various forensic science and conventional analytical laboratories, emphasizing the application of scientific methods and technologies to legal proceedings. With thoughtful planning, many students have found the program offerings helpful in building a strong foundation to pursue doctoral (Ph.D. and M.D.) studies. The program also offers, in conjunction with the Department of Computer and Information Sciences, the opportunity for students to pursue a graduate certificate in computer forensics that involves additional, elective coursework.

The program support includes many UAB faculty members from other departments, personnel from the Alabama Department of Forensic Sciences' Birmingham laboratory, the Jefferson County Medical Examiner's Office, the Birmingham Police Department, and local forensic science-related private institutions. In addition, the program maintains a close working relationship with the DNA profiling laboratories of the Alabama Department of Forensic Sciences and hosts the editorial offices of the Forensic Science Review (the only review journal in forensic science). Faculty research and practice focus especially on forensic aspects of drug chemistry and DNA-based identification.

Minimum admission requirements include a B.S. degree in Chemistry, Biology, or a related natural science. Coursework should include the completion of one year of general chemistry, one year of organic

chemistry, and quantitative analysis. Coursework is designed for qualified students to begin in fall and complete the program in 21 months. Admission is granted for the fall term only.

According to the National Institute of Justice (2004), students wishing to pursue a career in forensic science should be aware that positions in these fields usually require extensive background checks similar to those required for law enforcement personnel, and are likely a condition of employment. (National Institute of Justice (2004). *Education and Training in Forensic Science: A Guide for Forensic Science Laboratories, Educational Institutions, and Students.* NCJ Report 203099. Washington, DC: United States Department of Justice, pp. 7-10).

UAB graduates from the Master of Science in Forensic Science program are very successful in gaining employment within a year of graduating. During 2009-2011, the program graduated 25 students. Twenty-two of them currently are working in a laboratory, are teaching, or continuing their education in graduate school. Of these graduates, 14 are working in forensic science laboratories ranging from the FBI lab in Quantico, Virginia to a Sheriff's Department Lab in Ventura, California.

Additional Information

Deadline for Entry Term(s):	Fall
Deadline for All Application Materials to be in the Graduate School Office:	January 31 Later applications will be considered before April 30th if vacancies are available
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)

For detailed information, contact **Dr. Jason G. Linville**, UAB Department of Justice Sciences, University Boulevard Office Building (UBOB) Room 210, 1720 2nd Ave. S, Birmingham, Alabama 35294-4562.

Telephone: 205-934-2069

E-mail: **jglinvil@uab.edu**

Physical Address: UAB Department of Justice Sciences, UBOB 210, 1201 University Blvd., Birmingham, Alabama 35294.

Course Descriptions

All forensic science courses have a Justice Sciences (JS) prefix. Unless otherwise noted, all courses are for 3 semester hours of credit.

Justice Science (JS)

502. **Introduction to Computer Forensics**. Overview of retrieval, preservation, and presentation of evidence found in computers and other electronic communication devices.

551. **Research Methods in Forensic Science**. Exploration of research methods used in forensic science, including data collection techniques and reporting of results.

567. **Forensic Toxicology**. Discussion of drugs and poisons occurring in biological evidence, including the pharmacokinetic and pharmacodynamic properties of drugs and poisons, evidence collection and handling, selection of the most appropriate evidence, and analytical methods of detection.

572. **Molecular Biology for Forensic Scientists**. Prokaryotic and eukaryotic gene structure and function. Independent project required.

650. **Advanced Questioned-Death Investigation**. Examination of forensic pathology as used in/applied by local medical examiners' offices.

656. **Forensic Anthropology**. Applied human osteology, emphasizing ability to identify age, sex, and population type of skeletal material. Effects of disease and behavior on bones.

670. **Elements of Forensic Science**. Introduction to philosophical considerations and historic landmarks in the discipline; overview of major sub-disciplines in forensic science; examination of the role of expert witnesses and their importance.

671. **Conventional Criminalistics I**. Exploration of basic methodologies and approaches for analyzing trace and transfer evidence; examination of major evidence categories.

672. **Conventional Criminalistics II**. Examination of advanced methods for the analysis of trace and transfer evidence including methodologies for examination of firearms, and questioned documents. Prerequisite: JS 671.

673. **Forensic Drug Analysis**. Discussion of the isolation, identification, and quantification of commonly abused drugs and common poisons; interpretation of findings and correlation with legal applications.

674. **Biological Methods in Forensic Science**. Examination of biological evidence in crime laboratory, including identification of bloodstains and semen stains, and DNA typing of blood, bloodstains, and other body fluids.

675. **Law, Evidence, and Procedure**. Overview and examination of the legal aspects of physical evidence including rules of evidence, procedural rules, and the role of expert witnesses; moot court component.

676. **Advanced Biological Methods in Forensic Science**. Examines current issues and trends in forensic DNA analysis, including STR polymorphisms, stutter analysis, low copy number analysis, and Y-STRs. Prerequisite: JS 674.

677. **Advanced Forensic Toxicology**. Discussion of relevant analyses conducted for drugs and poisons occurring in biological evidence, including evidence collection and handling, selecting the most appropriate evidence, and the analytical process; examination of the pharmacokinetic and pharmacodynamic properties of detected substances.

679. **Seminar in Forensic Science**. Review, discussion, and presentation of the forensic literature; forensic science in the news, media, and public opinion.

680. **Graduate Internship in Forensic Science**. Field experience in forensic science agency. May be repeated for credit. 3-6 hours.

681. **Directed Research in Forensic Biology (Non-thesis)**. Forensic science problems, issues, and theories. May be repeated for credit. 1-6 hours.

682. **Directed Research in Forensic Chemistry (Non-thesis)**. Forensic science problems, issues, and theories. Includes laboratory component. May be repeated for credit. 1-6 hours.

684. **Thesis Research in Forensic Science**. Prerequisite: Admission to candidacy. May be repeated for credit. 1-6 hours.

History (M.A.)

Degree Offered:	M.A.
Director:	*Dr. John Van Sant*
Phone:	(205) 975-6520
E-mail:	**jvansant@uab.edu**
Web site:	**www.uab.edu/history**

Faculty

Carolyn A. Conley, Professor and Chair of the Department (History); British and Irish Political and Social History; History of Crime and Violence; Historiography

Robert G. Corley; Assistant Professor ; Modern South, History of Birmingham

Colin J. Davis, Professor (History); U.S. Labor, Women's Labor History, Social History.

Andrew Demshuk, Assistant Professor (History); Germany and Central Europe; Ethnic Cleansing and Forced Migration

Harriet E. Amos Doss, Associate Professor (History); U.S. Middle Period, Antebellum South, U.S. Social History

Robert F. Jefferson, Associate Professor (History); African American History, 20th Century U.S.

Andrew W. Keitt, Associate Professor (History); Early Modern Europe, European Cultural and Intellectual, Iberian World

George O. Liber, Professor (History); Soviet, Post-Soviet, Russian, Eastern European, and Ukraine

Andre J. Millard, Professor (History); History of Technology, Economic and U.S. Cultural History

Stephen J. Miller, Associate Professor (History); France; Economic History

Raymond A. Mohl, Distinguished Professor (History); U.S. Urban, Social, and Ethnic History; Historiography

Pamela S. Murray, Professor (History); Latin America, National Period, Colombia; Women's History

John E. Van Sant, Associate Professor (History); Japan, East Asia, World History

Brian D. Steele, Assistant Professor (History); Jefferson-Jackson, U.S. Social, Intellectual History

Walter D. Ward, Assistant Professor (History); Ancient World, Mediterranean, Islamic history

Emeritus Faculty

Virginia V. Hamilton, Professor and University Scholar Emerita (History); Twentieth-Century U.S., The South Since Reconstruction

Daniel R. Lesnick, Associate Professor Emeritus (History); Medieval and Renaissance History

Michael N. McConnell, Associate Professor Emeritus (History); Colonial America, Native Americans

Tennant S. McWilliams, Professor (History) and Dean Emeritus; Recent South, Modern United States, U.S. Foreign Affairs

James F. Tent, Professor and University Scholar Emeritus (History); Modern European History; Germany, Military History, Cold War

Samuel L. Webb, Associate Professor Emeritus (History); New South, Alabama, Legal and Constitutional history

Program Information

The history graduate program provides opportunities for students to learn the techniques of research and broaden their knowledge of historical literature. Students may choose Plan I, which includes writing a thesis based on original research using primary sources, or Plan II, which requires the completion of MA exams in three historical topics. All students are required to enroll in HY 601 (Historiography) and HY 602 (Historical Research and Writing) and must take at least 30 hours of their course work in graduate seminars. Each student must take a minimum of 9 hours of course work in U.S. history and 9 hours in non-U.S. history (e.g., European, Asian, Latin America, World).

Plan I (Thesis Plan)

HY 601	Historiography	3 hours
HY 602	Research and Writing	3 hours
U.S. History	3 seminars	9 hours
Non-U.S. History	3 seminars	9 hours
Electives	2 courses	6 hours
Thesis Research	2 courses or equivalent	6 hours
Foreign Language	Examination	0 hours
Total		36 hours

No foreign language study credits can be counted toward the degree requirements. Where foreign language requirements are appropriate, it is recommended that students satisfy these requirements before commencing thesis research.

Plan II: (Nonthesis Plan)

HY 601	Historiography	3 hours
HY 602	Research and Writing	3 hours
U.S. History	3 seminars	9 hours
Non-U.S. History	3 seminars	9 hours
Electives	4 courses	12 hours
Total		36 hours

Students interested in Teaching Certification for Public Schools should contact the School of Education Certification Office, EB 229, 1530 3rd Avenue South, Birmingham, Alabama 35294-1250 (telephone 205-934-5323).

Additional Information

Deadline for Entry Term(s):	Each semester

Deadline for All Application Materials to be in the Graduate School Office:	Six weeks before term begins
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)
Comments	Additional application for financial aid (fellowship or assistantship) is required by program
Graduate Catalog Description	**http://main.uab.edu/show.asp?durki=24904**

For detailed information, contact Dr. John Van Sant, History Graduate Program Director, Department of History, HHB 360, 1530 3rd Avenue South, Birmingham, Alabama 35294-.

Telephone 205-975-6520

E-mail **jvansant@uab.edu**

Course Descriptions

History (HY)

Courses are for 3 hours of credit unless otherwise indicated. All seminars except 601 and 602 may be taken more than once. Students may take no more than two Directed Readings courses (681) or internships (682).

601. **Historiography**. Seminar on various theoretical perspectives and methodologies of professional historians. What historians do, how they do it, and why.

602. **Historical Research and Writing**. Methods of historical research, including research in primary sources, and the distinctive characteristics of historical writing.

612. **Seminar in Early America**. Topics and issues in the history and historiography of Colonial North America, circa 1500-1775.

613. **Seminar in the Civil War Period**. Specialized themes and military, political, social and economic developments related to Civil War; particular emphasis on the South, 1860-1865.

614. **Seminar in Recent American History**. Topics in the politics of modern America.

621. **Seminar in Southern History to 1877**. Subjects ranging from the Antebellum through Reconstruction periods.

622. **Seminar in Southern History Since 1877**. Subjects pertaining to the New South era.

623. **Seminar in Alabama History**. Specific social, political, and economic aspects of Alabama history.

631. **Seminar: Topics in American History**. Historical topics of American history (e.g., conservatism, crime and punishment).

632. **Seminar in U.S. Urban History**. Topics in urban history.

633. **Seminar in American Constitutional and Legal History**. Study of major trends and cases in the history of American law, with special emphasis on the interpretation of the American constitution by the Supreme Court.

634. **Seminar in American Foreign Relations**. Selected topics related to American experience with foreign relations.

635. **Seminar in American Social History**. A reading and research seminar examining the history of the structure and power of social groups in America.

637. **Seminar in U.S. Labor History**. Development of labor force and movements in U.S. nineteenth and twentieth centuries.

638. **Seminar in Civil Rights History**. An analysis of history and historiography of Civil Rights Movement in America since the 19th century.

639. **Seminar in Women's History**. An analysis of the changing economic, political, and social roles of women.

641. **Seminar in Latin American History**. Issues in history of Latin America since the late 18th century: economic development, dependency and popular resistance, role of the Catholic Church, social

revolution, and nationalism.

650. **Seminar.** Topics in European History.

651. **Seminar in Pre-Modern History**. Survey of the pre-modern world focusing on society, religion, and culture before 1500.

652. **Seminar in the Renaissance**. Special attention given to the new urban context of society, culture, politics, art, and religion.

653. **Seminar in Modern Europe**. Reformation to the present; major topics such as society and politics, warfare, religious trends, state building, and industrialization.

654. **Seminar in British History**. Focuses on a particular period or problem in British history. Reading and discussion of current publications on the topic.

655. **Seminar in Russian/Soviet History**. Analysis of primary sources and secondary works dealing with political and social history of Imperial Russia or Soviet Union and their successor states.

656. **Seminar in French History**. Seminar dealing with various periods and issues in the history of France.

671. **Seminar in Asian History**. Topics in Asian History.

672. **Seminar: Topics in World History**. Seminar in historical topics of world history.

673. **Seminar in World Environmental History**. Comparative examination of cultures and their relationship with the natural environment in a modern world context.

674. **Seminar in Comparative History**. Explores through reading and research varied issues in comparative history; revolution, war, slavery, labor, urbanization, industrialization, nationalism, democratization, and social and cultural topics.

675. **Seminar in World Economic History**

681. **Directed Readings in History**. Individually designed course of readings in various fields. May be

repeated. Only two directed reading courses will count toward degree requirements for history majors. Prerequisite: Permission of instructor. 1, 2, 3, and 6 hours.

682. **Internship in Public History.** Individually designed program that places students in local historical museums and sites to gain professional experience in public history. Prerequisite: Permission of instructor. 1 to 3 hours.

683. **Seminar in Public History**. Explores the diverse approaches and methods of presenting history to public audiences, museums, historic sites, architectural preservation, documentary editing, and archival preservation.

693. **Special Topics in History**. Seminar exploring the historiography of a specialized topic in history.

694. **Special Topics in History**. Seminar exploring the historiography of a specialized topic in history.

698. **Nonthesis Research**. Individual research project. 3-6 hours.

699. **Thesis Research**. Research culminating in master's thesis in history. Prerequisite: Admission to candidacy. 3-6 hours.

Mathematics (M.S.)

Degree Offered:	M.S.
Director:	*Karpechina*
Phone:	(205) 934-2154
E-mail:	**karpeshi@uab.edu**
Web site:	**http://www.uab.edu/mathematics/**

Faculty

Alexander Blokh, Professor (Mathematics); Dynamical Systems.

Nikolai Chernov, Professor (Mathematics); Dynamical Systems, Ergodic Theory

Louis Dale, Professor (Mathematics); Ring Theory

Hassan Fathallah, Associate Professor (Mathematics); Mathematical Biology

Paul H. Jung, Assistant Professor (Mathematics); Probability Theory

Ioulia Karpechina, Professor (Mathematics); Partial Differential Equations and Mathematics Physics

Ian W. Knowles, Professor (Mathematics); Ordinary and Partial Differential Equations, Numerical Analysis

Roger T. Lewis, Professor Emeritus (Mathematics); Differential Equations, Spectral Theory

Junfang Li Assistant Professor (Mathematics); Nonlinear Partial Differential Equations.

John C. Mayer, Professor (Mathematics); Topology, Continuum Theory, Dynamical Systems

Mubenga N. Nkashama, Professor (Mathematics); Differential Equations, Dynamical Systems, Nonlinear Functional Analysis

Peter V. O'Neil, Professor Emeritus (Mathematics); Graph Theory, Combinatorics

Lex G. Oversteegen, Professor (Mathematics); Topology, Continuum Theory, Dynamical Systems

Yoshimi Saito, Professor Emeritus (Mathematics); Scattering Theory, Differential Equations

Roman Shterenberg, Associate Professor (Mathematics); Mathematical Physics, Spectral Theory, Inverse Problems, Partial Differential Equations, Non-linear Partial Differential Equations

Nandor Simanyi, Professor (Mathematics); Dynamical Systems With Some Algebraic Flavour

Gunter Stolz, Professor (Mathematics); Spectral Theory, Mathematical Physics

James R. Ward, Jr., Professor Emeritus (Mathematics); Differential Equations, Nonlinear Analysis, Dynamical Systems

Rudi Weikard, Professor (Mathematics); Ordinary and Partial Differential Equations, Mathematical Physics

Gilbert Weinstein, Associate Professor (Mathematics); Partial Differential Equations, General Relativity, Differential Geometry

Yanni Zeng, Associate Professor (Mathematics); Nonlinear Partial Differential Equations, Numerical Analysis, Gas Dynamics

Henghui Zou, Associate Professor (Mathematics); Nonlinear Partial Differential Equations, Nonlinear Analysis

Program Information

Mathematics has always been divided into a pure and an applied branch. However, these have never been strictly separated. The M.S. program in mathematics stresses the interconnection between pure mathematics and its diverse applications.

Areas of Specialization

The student must choose a primary and a secondary specialization from a list of areas determined by the expertise of the faculty. As soon as the student is ready to choose specialization areas, he or she should contact the mathematics graduate program director, who will nominate a graduate study committee for the student. Courses offered to meet degree requirements must be approved by the mathematics graduate program director and the student's graduate study committee.

Degree Requirements

Plan I (Thesis)

The student must complete 30 semester hours approved by the mathematics graduate program director and the student's graduate study committee. The grade in each course has to be a B or better. A minimum of 24 hours must be on the 600 level or above. See Course Descriptions for which courses at the 500 level may not be counted toward the M.S. degree. In addition the following specific requirements must be met:

- at least 9 hours must be in the primary area of specialization,
- at least 6 hours must be in the secondary area of specialization,
- at least 9 hours must be outside the primary area,
- at most 6 hours of research may be included in the 30-hour requirement,
- a thesis must be completed, and
- an examination must be passed on material in the primary area of specialization (the exam may be written, oral, or both, at the discretion of the student's graduate study committee).

  The student's performance in all respects must be approved by the graduate program director and the student's graduate study committee.

Plan II (Nonthesis)

The student must complete 30 semester hours approved by the mathematics graduate program director and the student's graduate study committee. The grade in each course has to be a B or better. A minimum of 24 hours must be on the 600 level or above. See Course Descriptions for which courses at the 500 level may not be counted toward the M.S.degree. In addition, the following specific requirements must be met:

- at least 12 hours must be in the primary area of specialization,
- at least 6 hours must be in the secondary area of specialization,
- at least 9 hours must be outside the primary area,
- no research may be included in the 30-hour requirement,

Two examinations must be passed on material in the two areas of specialization. (The exams may be written, oral, or both, at the discretion of the student's graduate study committee.)

Additional Information

Deadline for Entry Term(s):	Each semester
Deadline for All Application Materials to be in the Graduate School Office:	Six weeks before term begins
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)
Comments	None

For detailed information, contact Dr. Ioulia Karpechina, Mathematics Graduate Program Director, UAB Department of Mathematics, CH 493B, 1500 University Boulevard, Birmingham, Alabama 35294-1170.

Telephone 205-934-2154

E-mail **karpeshi@uab.edu**

Web **http://www.uab.edu/mathematics/**

Course Descriptions

All courses carry 3 hours of credit unless otherwise noted. A course may count as a prerequisite only if it was completed with a grade of B or better. The instructor can waive any prerequisite. Courses numbered below 520 and 540-541 may not be counted toward a graduate degree in mathematics**.**

501. **History of Mathematics I.** Development of mathematical principles and ideas from an historical viewpoint, and their cultural, educational and social significance; earliest origins through Newton and Leibnitz. Prerequisite: Undergraduate level MA 125 Minimum Grade of C or Undergraduate level MA 142 Minimum Grade of C.

502. **History of Mathematics II**. Development of mathematical principles and ideas from an historical viewpoint, and their cultural, educational and social significance; Newton and Leibnitz through early 20th century. Prerequisite: MA 501 Minimum grade of B or MA 311 Minimum grade of B.

513**. Patterns, Functions & Algebraic Reasoning**. Problem solving experiences, inductive and deductive reasoning, patterns and functions, some concepts and applications of geometry for elementary and middle school teachers. Topics include linear and quadratic relations and functions and some cubic and exponential functions. Number sense with the rational number system including fractions, decimals and percents will be developed in problem contexts. An emphasis will be on developing algebraic thinking and reasoning. Recommended that 2 years of high school algebra or MA102 has been completed before taking course.

514**. Geometry & Proportional Reasoning**. Problem solving experiences, inductive reasoning, concepts and applications of geometry and proportional reasoning for elementary and middle school teachers. Topics include analysis of one, two and three dimensional feature of real objects, ratio and proportionality, similarity and congruence, linear, area, and volume measurement, and the development of mathematically convincing arguments. An emphasis will be on developing thinking and reasoning.

515. **Probabilistic & Statistics Reasoning**. Descriptive and inferential statistics, probability, estimation, hypothesis testing. Reasoning with probability and statistics is emphasized.

516. **Numerical Reasoning**. Develop understanding of numbers and improve numerical reasoning skills specifically with regard to place value, number relationships that build fluency with basis facts, and computational proficiency; developing a deep understanding of numerous diverse computational algorithms; mathematical models to represent fractions, decimals and percents, equivalencies and operations with fractions, decimals and percents; number theory including order of operations, counting as a big idea, properties of numbers, primes and composites, perfect, abundant and significant numbers, and figurate numbers; inductive and deductive reasoning with numbers.

517. **Extending Algebraic Reasoning.** Extending algebraic and functional reasoning to polynomials, rational, exponential, and logarithmic functions; problem-solving involving transfer among representations (equation, graph, table); proof via symbolic reasoning, contradiction, and algorithm; interpretation of key points on graphs (intercepts, slope, extrema); develop facility and efficiency in manipulating symbolic representations with understanding; appropriate use of technology and approximate versus exact solutions; functions as models. Prerequisite: MA 313.

519. **Special Topics for Teachers**. With permission of instructor, may be used as continuation of any of MA 513 through 518. May be repeated for credit when topics vary.

534. **Algebra I: Linear.** Abstract vector spaces, subspaces, dimension, bases, linear transformations, matrix algebra, matrix representations of linear transformations, determinants. Prerequisites: MA 142 or permission of instructor.

535. **Algebra II: Abstract.** Groups, homomorphisms, quotient groups, isomorphism theorems, rings and ideals, integral domains, fields. As time permits, Galois theory, semigroups, modules, or other areas of algebra may be included. Prerequisites: MA 534 or permission of instructor.

540. **Advanced Calculus I**. Introduction to the real numbers; sequences and series of real numbers; functions and continuity; differentiation. This course is taught as a do-it-yourself course and will meet 4 hours per week. Prerequisites: Admission to the graduate program or permission of instructor.

541. **Advanced Calculus II**. Integration; sequences and series of functions; uniform vs. pointwise convergence; some elementary and special functions. This course is taught as a do-it-yourself course and will meet 4 hours per week. Prerequisites: Admission to the graduate program or permission of instructor.

544. **Vector Analysis**. Review and applications of multiple integrals, Jacobians and change of variables in multiple integrals; line and surface integrals; theorems of Green, Gauss, and Stokes with application to the physical sciences; computation in spherical and cylindrical coordinates. Prerequisite: MA 244.

545. **Complex Analysis**. Analytic functions, complex integration and Cauchy's theorem, Taylor and Laurent series, calculus of residues and applications, conformal mappings. Prerequisite: MA 244.

553. **Transforms.** Theory and applications of Laplace and Fourier transforms. Prerequisite: MA 252.

554. **Intermediate Differential Equations**. Topics from among Frobenius series solutions, Sturm-Liouville systems, nonlinear equations, and stability theory. Prerequisite: MA 252.

555, 556. **Partial Differential Equations I, II**. Classification of second-order partial differential equations, background on eigenfunction expansions and Fourier series, solution of the wave equation, reflection of waves, solution of the heat equation in bounded and unbounded media, Laplace's equation, Dirichlet and Neumann problems. Prerequisite: MA 252.

560. **Scientific Programming.** This course is designed to provide the computational skills needed to attempt serious scientific computational tasks. Computers and floating point arithmetic; the GNU/Linux operating system and an introduction to the complied programming languages FORTRAN (including FORTRAN 95) and C++ in the context of solving systems of linear equations and differential equations arising from practical situations; use of debuggers and other debugging techniques, and profiling; use of callable subroutine packages like LAPACK and differential equation routines; parallel programming a Beowulf system with MPI; introduction to Matlab.

561. **Modeling with PDE.** Practical examples of partial differential equations; derivation of partial differential equations from physical laws; introduction to MATLAB and its PDE Toolbox, and other PDE packages such as FEMLAB using practical examples; brief discussion of finite difference and finite element solution methods; introduction to continuum mechanics and classical electrodynamics; parallel programming using MPI and the mathematics department Beowulf system; specialized modeling projects in topics such as groundwater modeling, scattering of waves, medical and industrial imaging, fluid mechanics, and acoustic and electromagnetic applications.

562. **Intro to Stochastic Defferential Equations.** Stochastic differential equations arise when random effects are introduced into the modeling of physical systems. Topics include Brownian motion and Wiener processes, stochastic integrals and the Ito calculus, stochastic differential equations, and applications to financial modeling, including option pricing.

563, 564. **Operations Research I, II**. Mathematical techniques and models with application in industry, government, and defense. Topics usually chosen from dynamic, linear, and nonlinear programming, decision theory; Markov chains, queuing theory, inventory control, simulation, network analysis, and selected case studies. Prerequisite: MA 243.

565. **PDE: Finite Difference Methods.** Review of difference methods for ordinary differential equations including Runge-Kutta, multistep, adaptive stepsizing, and stiffness; finite difference versus finite element; elliptic boundary value problems, iterative solution methods, self-adjoint elliptic problems; parabolic equations including consistency, stability, and convergence, Crank-Nicolson method, method of lines; first order hyperbolic systems and characteristics, Lax- Wendroff schemes, method of lines for hyperbolic equations.

567. **Gas Dynamics.** Euler s equations for in viscid flows, rotation and vorticity, Navier-Stok

568, 569. **Numerical Analysis I, II**. Integrals, interpolation, rational approximation, numerical solution of ordinary differential equations, iterative solution of algebraic equations in single variable, least squares. Gaussian elimination for solution of linear equations. Prerequisites: MA 252 and either MA 263 or CS 210.

570, 571. **Differential Geometry I, II**. Theory of curves and surfaces: Frenet formulas for curves, first and second fundamental forms of surfaces. Global theory; abstract surfaces, manifolds, Riemannian geometry. Prerequisite: MA 244.

572**. Geometry I.** The axiomatic method; Euclidean geometry including Euclidean constructions, basic analytical geometry, transformational geometry, and Klein s Erlanger Program; introduction to fractal geometry. Course integrates intuition/ exploration and proof/explanation.

573**. Geometry II.** Analytical geometry, Birkhoff s axioms, and the complex plane; structure and representation of Euclidean isometries; plane symmetries; non- Euclidean (hyperbolic) geometry and non-Euclidean transformations; fractal geometry; algorithmic geometry. Course integrates intuition/exploration and proof/explanation. Project and report or oral presentation required.

574, 575. **Introduction to Topology I, II**. Separable metric spaces, basis and sub-basis, continuity, compactness, completeness, Baire category theorem, countable products, general topological spaces, Tychonov theorem. Prerequisite: MA 244.

585. **Probability**. Probability spaces, combinatorics, conditional probabilities and independence, Bayes rule, discrete and continuous distributions, mean value and variance, moment generation function, joint distributions, correlation, Central Limit Theorem, Law of Large Numbers, random walks, Poisson process. Prerequisite: Undergraduate level MA126 Minimum Grade of C.

586**. Mathematical Statistics.** Confidence intervals, hypothesis testing, analysis of variance and co-variance, maximum likelihood estimates, linear regression, tests of fit, robust estimates and tests. Prerequisite: MA 485 Minimum grade of B or MA 585 Minimum grade of B.

587. **Advanced Probability.** Foundation of probability, conditional probabilities, and independence, Bayes theorem, discrete and continuous distributions, joint distributions, conditional and marginal distributions, convolution, moments and moment generation function, multivariable normal distribution and sums of normal random variables, Markov chains. Prerequisite: MA 485 Minimum grade of B or MA 585 Minimum grade of B. 3 hours.

590-591. **Math Seminar**. Topics vary; may be repeated for credit. Prerequisites vary with topics. 1-3 hours.

592-597. **Special Topics in Mathematics**. These courses cover special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics. 1, 2, or 3 hours.

598-599. **Research in Mathematics.** Topics vary; may be repeated for credit. Prerequisites vary with topics. 1-3 hours.

610**. Introduction to Set Theory**. Set theory, products, relations, orders and functions, cardinal and ordinal numbers, transfinite induction, axiom of choice, equivalent statements.

630. **Algebra I**. Propositional and predicate logic; set, relations, and functions; the induction principle; Groups, in particular symmetry groups, permutations groups, and cyclic groups; cosets and quotient groups; group homomorphisms; rings, integral domains, and fields; ideals and rings homomorphisms; factorization; polynomial rings. Prerequisites: Admission to graduate program or permission of instructor.

631. **Algebra II**. Vector spaces and their bases; linear transformations; eigenvalues and eigenvectors; Jordan canonical form; multilinear algebra and determinants; norms and inner products. Prerequisites: Admission to graduate program or permission of instructor.

642. **Calculus of Several Variables**. Functions of several variables; total and partial derivatives; the implicit function theorem, integration of different forms; Stokes' Theorem. Prerequisites: A grade of at least B in MA 441/541 or permission of instructor.

645. **Real Analysis I.** Abstract measures and integration; positive Borel measures; *Lp spaces. Prerequisites: A grade of at least B in MA 642 or permission of instructor.*

646. **Real Analysis II**. Complex measures and the Radon-Nikodym theorem; differentiation; integration on product spaces and Fubini theorem. Prerequisites: A grade of at least B in MA645 or permission of instructor.

648. **Complex Analysis**. The algebraic and topological structure of the complex plane, analytic functions, Cauchy's integral theorem and integral formula, power series, elementary functions and their Riemann surfaces, isolated singularities, residues, the Laurent expansion, the Riemann mapping. Prerequisite: A grade of at least B in MA 642 or permission of instructor.

650. **Differential Equations**. Separable, linear, and exact first-order equations; existence and uniqueness theorems; continuous dependence of solutions on data and initial conditions; first order systems and higher order equations; stability for two-dimensional linear systems; higher order linear systems; boundary value problems; stability theory. Prerequisites: A grade of at least B in MA 630 or permission of instructor.

655**. Partial Differential Equations.** This course covers first order partial differential equations, elliptic equations, parabolic equations, and hyperbolic equations. The prerequisites for this class are MA 642, or MA 650, or permission of the instructor.

660. **Numerical Linear Algebra**. Vectors and matrix norms; the singular value decomposition; stability; condition numbers and error analysis; QR factorization; LU factorization; least squares problems; computation of eigenvalues and eigenvectors; iterative methods. Prerequisites: A grade of at least B in MA 630 or permission of instructor.

661. **Modeling with PDE.** Practical examples of partial differential equations; derivation of partial differential equations from physical laws; introduction to MATLAB and its PDE Toolbox, and other PDE packages such as FEMLAB using practical examples; brief discussion of finite difference and finite element solution methods; introduction to continuum mechanics and classical electrodynamics; parallel programming using MPI and the mathematics department Beowulf system; specialized modeling projects in topics such as groundwater modeling, scattering of waves, medical and industrial imaging, fluid mechanics, and acoustic and electromagnetic applications.

663-664. **Operations Research I-II**. Mathematical optimization techniques. Formulation, solution, and analysis of problems arising from business, engineering, and science. Prerequisite: MA 244.

665. **Partial Differential Equations: Finite Difference Method.** Review of difference methods for ordinary differential equations including Runge-Kutta, multi-step, adaptive step-sizing, and stiffness; finite difference versus finite element; elliptic boundary value problems; iterative solution methods, self-adjoint elliptic problems; parabolic equations including consistency, stability, and convergence, Crank-Nicolson method, method, method of lines; first order hyperbolic systems and characteristics Lax-Wendroff schemes, methods of lines for hyperbolic equations.

668, 669. **Numerical Analysis I, II**. Integrals, interpolation, rational approximation, numerical solution of ordinary differential equations, iterative solution of algebraic equations in single variable, least squares. Gaussian elimination for solution of linear equations. Prerequisites: MA 252 and either MA 263 or CS 210.

670. **Topology I**. Definition of topologies; closure; continuity; product topology; metric spaces. Prerequisites: A grade of at least B in MA 630 or permission of instructor.

671. **Topology II**. Connectedness; completeness and compactness (in particular in metric spaces); countability and separation axioms; Tychonoff's theorem; homotopy; partitions of unity. Prerequisites: A grade of at least B in MA 670 or permission of instructor.

675. **Differential Geometry.** Local and global theory of curves and surfaces: Fenchel's theorem; the first and second fundamental forms; surface area; Bernstein's theorem; Gauss theorema egregium; local intrinsic geometry of surfaces; Riemannian surfaces; Lie derivatives; covariant differentiation; geodesics; the Riemann curvature tensor; the second variation of arclength; selected topics in the global theory of surfaces. Prerequisites: A grade of at least B in MA 642 or permission of instructor.

687. **Advanced Probability.** Foundation of probability, conditional probabilities, and independence, Bayes theorem, discrete and continuous distributions, joint distributions, conditional and marginal distributions, convolution, moments and moment generation function, multivariable normal distribution and sums of normal random variables, Markov chains. Prerequisite: MA 485 Minimum grade of B or MA 585 Minimum grade of B. 3 hours.

690, 691. **Mathematics Seminar.** This course covers special topics in mathematics and the applications of the mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

691-697. **Special Topics in Mathematics**. These courses cover special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics. 1, 2, or 3 hours.

698. **Nonthesis Research**. Prerequisite: Permission of instructor. 1-6 hours.

699. **Thesis Research**. Prerequisite: Admission to candidacy and permission of instructor. 1-6 hours

Mathematics, Applied (Ph.D.*)

*The Applied Mathematics graduate program is offered jointly by the University of Alabama at Birmingham, the University of Alabama (Tuscaloosa), and the University of Alabama in Huntsville.

	Ph.D.*
Degree Offered:	
Director:	*Karpechina*

Phone: (205) 934-2154

E-mail: karpeshi@uab.edu

Web site: http://www.uab.edu/mathematics/

Faculty

Alexander Blokh, Professor (Mathematics); Dynamical Systems.

Nikolai Chernov, Professor (Mathematics); Dynamical Systems, Ergodic Theory

Louis Dale, Professor (Mathematics); Ring Theory

Hassan Fathallah, Associate Professor (Mathematics); Mathematical Biology

Paul H. Jung, Assistant Professor (Mathematics); Probability Theory

Ioulia Karpechina, Professor (Mathematics); Partial Differential Equations and Mathematics Physics

Ian W. Knowles, Professor (Mathematics); Ordinary and Partial Differential Equations, Numerical Analysis

Roger T. Lewis, Professor Emeritus (Mathematics); Differential Equations, Spectral Theory

Junfang Li Assistant Professor (Mathematics); Nonlinear Partial Differential Equations.

John C. Mayer, Professor (Mathematics); Topology, Continuum Theory, Dynamical Systems

Mubenga N. Nkashama, Professor (Mathematics); Differential Equations, Dynamical Systems, Nonlinear Functional Analysis

Peter V. O'Neil, Professor Emeritus (Mathematics); Graph Theory, Combinatorics

Lex G. Oversteegen, Professor (Mathematics); Topology, Continuum Theory, Dynamical Systems

Yoshimi Saito, Professor Emeritus (Mathematics); Scattering Theory, Differential Equations

Roman Shterenberg, Associate Professor (Mathematics); Mathematical Physics, Spectral Theory, Inverse Problems, Partial Differential Equations, Non-linear Partial Differential Equations

Nandor Simanyi, Professor (Mathematics); Dynamical Systems With Some Algebraic Flavour

Gunter Stolz, Professor (Mathematics); Spectral Theory, Mathematical Physics

James R. Ward, Jr., Professor Emeritus (Mathematics); Differential Equations, Nonlinear Analysis, Dynamical Systems

Rudi Weikard, Professor (Mathematics); Ordinary and Partial Differential Equations, Mathematical Physics

Gilbert Weinstein, Associate Professor (Mathematics); Partial Differential Equations, General Relativity, Differential Geometry

Yanni Zeng, Associate Professor (Mathematics); Nonlinear Partial Differential Equations, Numerical Analysis, Gas Dynamics

Henghui Zou, Associate Professor (Mathematics); Nonlinear Partial Differential Equations, Nonlinear Analysis

Program Information

Mathematics has always been divided into a pure and an applied branch. However, these have never been strictly separated. The Ph.D. program in applied mathematics stresses the interconnection between pure mathematics and its diverse applications.

Admission

Only students with a firm foundation in advanced calculus, algebra, and topology are considered for immediate admission to the Ph.D. program. A student lacking this background will be considered for admission to the M.S. program. Upon passing the qualifying examination, a student may transfer to the Ph.D. program. We expect at least a B average in a student's previous work and a score above 550 on each section of the Graduate Record Examination General Test.

Program of Study

Each student in the Ph.D. program has to take the following steps:

Passing the Joint Program Exam (JPE), also called the Qualifying Exam. This is an exam in real analysis and applied linear algebra. It is administered by the Joint Program Committee, which includes graduate faculty from all three participating universities. A student that is admitted directly into the Ph.D. program is expected to take this exam by the end of the first year at the latest. This examination may be taken no more than twice.

Completing 54 semester hours of graduate courses. The grade of each course has to be at least a B. The

student's supervisory committee and the Joint Program Committee must approve the selection of courses. At least 18 hours must be in a major area of concentration, selected so that the student will be prepared to conduct research in an area of applied mathematics, while at least 12 hours have to be in a minor area of study, which is a subject outside mathematics.
Passing a language or tool of research exam.
Passing the Comprehensive Exam, which consists of a written part and an oral part.
Preparing a dissertation, which must be a genuine contribution to mathematics.
Passing the Final Examination (thesis defense).

Additional Information

For detailed information, contact Dr. Ioulia Karpechina, Mathematics Graduate Program Director, UAB Department of Mathematics, CH 493B, 1500 University Boulevard, Birmingham, Alabama 35294-1170.

Telephone 205-934-2154

E-mail **karpeshi@uab.edu**

Web **http://www.uab.edu/mathematics/**

Course Descriptions

For courses at cooperating universities, see the graduate catalogs of the University of Alabama (Tuscaloosa) and the University of Alabama in Huntsville. Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

In addition to courses offered in the M.S. program, the following courses are offered in the Ph.D. program. All courses carry 3 hours of credit unless otherwise noted.

740. **Advanced Complex Analysis.** Varying topics. May be repeated for credit. Prerequisites: Having passed the Qualifying Exam or permission of instructor.

745. **Functional Analysis I**. Normed and Banach spaces, inner product and Hibert spaces, linear functionals and dual spaces, operators in Hilbert spaces, theory of unbounded sesquilinear forms, Hahn-Banach, open mapping, and closed graph theorems, spectral theory. Prerequisites: Having passed the Qualifying Exam or permission of instructor.

746. **Functional Analysis II.** Varying topics. May be repeated for credit. Prerequisites: Having passed the Qualifying Exam or permission of instructor.

747. **Linear Operators in Hilbert Space**. Hilbert space, Bessel's inequality, Parseval's formula, bounded and unbounded linear operators, representation theorems, the Friedrichs extension, the spectral theorem for self-adjoint operators, spectral theory for Schrödinger operators. Prerequisites: Having passed the Qualifying Exam or permission of instructor.

748. **Fourier Transforms**. Fourier transform and inverse transform of tempered distributions; applications to partial differential equations. Prerequisites: Having passed the Qualifying Exam or permission of instructor.

750. **Advanced Ordinary Differential Equations**. Varying topics. May be repeated for credit. Prerequisites: Having passed the Qualifying Exam or permission of instructor.

753. **Nonlinear Analysis**. Selected topics including degree theory, bifurcation theory, and topological methods. Prerequisite: Having passed the Qualifying Exam or permission of instructor.

755. **Advanced Partial Differential Equations**. Selected topics varying with instructor. : Having passed the Qualifying Exam or permission of instructor.

760. **Dynamical Systems I.** Continuous dynamical systems. Limit sets, local sections, minimal sets, centers of attraction, recurrence, stable and wandering points, flow boxes, and monotone sequences in planar dynamical systems, Poincare-Bendixson theorem. Prerequisites: Having passed the Qualifying Exam or permission of instructor.

761. **Dynamical Systems II**. Discrete dynamical systems. Hyperbolicity, symbolic dynamics, chaos, homoclinic orbits, bifurcations, and attractors (theory and examples). Prerequisite: Having passed the Qualifying Exam or permission of instructor.

770. **Continuum Theory**. Pathology of compact connected metric spaces. Inverse limits, boundary bumping theorem, Hahn-Muzukiewicz theorem, composants, chainable and circle-like continua, irreducibility, separation, unicoherence, indecomposability. Prerequisite: Having passed the Qualifying Exam or permission of instructor.

772. **Complex Analytic Dynamics**. Riemann surfaces, iteration theory of polynomials, rational functions and entire functions, fixed point theory, Mandelbrot set, Julia sets, prime ends, conformal mappings. Prerequisite: Having passed the Qualifying Exam or permission of instructor.

774. **Algebraic Topology**. Covering spaces; introduction to homotopy theory, singular homology, cohomology. Prerequisites: Having passed the Qualifying Exam or permission of instructor.

776. **Advanced Differential Geometry**. Varying topics. May be repeated for credit. Prerequisite: Having passed the Qualifying Exam or permission of instructor.

781**. Differential Topology I**. A study of differentiable structures on manifolds, primarily from a global viewport: smooth mappings including diffeomorphisms, immersions and submersions; submanifolds and transversality.

782. **Differential Topology II**. A continuation of MA 781, with further applications such as Morse Theory.

790,791**. Mathematics Seminar.** This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

792-797. **Special Topics in Mathematics**. These courses cover special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites Permission of instructor. 1, 2, or 3 hours.

798. **Nondissertation Research**. Prerequisite: Permission of instructor. 1-6 hours.

799. **Dissertation Research**. Prerequisite: Admission to candidacy and permission of instructor. 1-6 hours.

Biomathematics (BST)

Please see Biostatistics (BST) course descriptions for additional graduate courses in applied mathematics

Physics (Ph.D., M.S.)

Degree Offered:	Ph.D., M.S.
Director:	*Dr. Mary Ellen Zvanut*
Phone:	(205) 934-6661
E-mail:	**mezvanut@uab.edu**
Web site:	**www.phy.uab.edu**

Faculty

Renato P. Camata, Associate Professor (Physics); Laser Synthesis, Processing, and Characterization of Nanostructured Materials; Aerosol Strategies in Nanoparticle Research; Hybrid Organic/Inorganic Nanocomposites; Bioactive Nanoparticles and Coatings.

Shane Aaron Catledge, Assistant Professor (Physics); Materials Science, Nanolithography of biomaterials, biosensors, bone regeneration, synthesis and properties of nanostructured super-hard materials; Chemical vapor Deposition (CVD) of diamond films and novel nanostructured coatings for biomedical implants; mechanical properties

Joseph G. Harrison, Associate Professor (Physics); Energy-Band Structure, Electronic Structure of Defect Systems, Simulation of CVD processes and EM Energy Deposition in Tissue.

David J. Hilton, Assistant Professor (Physics); Terahertz Time-Domain Spectroscopy, Correlated Electron Materials, Complex Functional Nanomaterials. High Magnetic Field Spectroscopy, Imaging.

Ryoichi Kawai, Associate Professor (Physics); Condensed Matter Physics Theory, Computational Physics, Science of Complexity

Chris M. Lawson, Professor (Physics); Nonlinear Optics, Fiber Optics, Optical Sensor

Sergey B. Mirov, University Professor (Physics); Experimental Quantum Electronics, Solid-State Lasers, Laser Spectroscopy

Thomas M. Nordlund, Associate Professor (Physics); Structure and Dynamics of Biological Macromolecules, Optical Spectroscopy and Imaging, Photobiophysics.

David L. Shealy, Chair, Professor (Physics); Geometrical Optics, Laser Beam Shaping Optics; Theoretical Optics, High Performance Computing.

Andrei Stanishevsky, Associate Professor (Physics); Nanomaterials and Nanoparticles, Thin Films, Nanostructures, Biomedical and Optical Applications of Nanomaterials and Nanodevices

Yogesh K. Vohra, Professor & University Scholar (Physics); High Pressure Materials Research, Growth and Characterization of Synthetic Diamond, and Nanoscale Materials for Biomedical Applications

Xujing Wang, Associate Professor (Physics); Physics of Complex Systems, Network Biology, Integrative Genomics of Complex Disease, and System Biology of Glycemic Control.

Lowell E. Wenger, Professor (Physics); Magnetic Materials and Superconductors

Mary Ellen Zvanut, Professor (Physics); Electrical and EPR Studies of Insulators and Semiconductors

Program Information

Students in the M.S. and Ph.D. programs may specialize in any of the areas of interest to the faculty, including experimental physics and astrophysics, theoretical and computational physics, or biophysics and medical applications of physics.

Admission

Admission into the physics graduate program is by recommendation of the graduate admission committee of the Department of Physics. The committee takes into consideration GRE General Test scores, prior academic performance, personal statement, prior research experiences, and the letters of evaluation, usually from former instructors and research supervisors.

Beginning the Program

All students must take a placement examination on basic physics concepts before registering for any courses. Upon arrival at UAB, international students may be required to take English as a Second Language course or Scientific Communication courses at UAB during their first year of study.

M.S. Program

Plan I

The student must successfully complete at least 30 semester hours of coursework, including at least four core courses selected from PH 610-611, 650-651, and 671-672 and 6 semester hours of Thesis Research (PH 699). The student must also write and complete a successful oral defense of a thesis under the direction of a graduate faculty member. Additional coursework should be selected with the advice of the student's graduate study committee to meet the particular needs of the student.

An interdisciplinary track for an M.S. degree Plan I is also offered. Students admitted to this track will typically hold a bachelor's degree in a science area other than physics, such as astronomy, biology, chemistry, geology, mathematics, or psychology, or an engineering degree, including optics and materials science. Thesis research will be in an interdisciplinary area, including astrophysics, astrobiology, biophysics, chemical physics, geophysics, mathematical physics, neurophysics, optics, materials science, or engineering physics. Students awarded an M.S. degree within this track will be prepared for an Assistant Research Physicist position, including qualification for co authorship, and would typically work under the direction of a doctoral-level person. The acquired skill would be highly marketable, as

individuals trained in multidisciplinary areas for basic and applied research are increasingly in demand in industry, government laboratories, and other research institutions.

Acceptance into this interdisciplinary track will be through a Physics Graduate Faculty member, who will be prepared to supervise the student's thesis research and develop a plan of study. This plan of study will include a core of courses (Classical Mechanics, PH 561-562; Electromagnetic Theory, PH 545-546; and Quantum Mechanics, PH 550-551), other physics graduate-level courses, and a minimum of 12 hours of graduate-level courses offered by other departments. The Department of Physics will establish a standing Physics Interdisciplinary Track Committee to review and concur in each student's plan of study. As is current practice, thesis oversight will be by the student's M.S. Graduate Study Committee.

Plan II

With approval of the physics graduate program director, a nonthesis option (Plan II) is available for all tracks in the Masters program. In this case, the graduate study committee requires an additional 6 semester hours of coursework instead of a thesis and gives the student an M.S.-degree exit examination.

Ph.D. Program

Students may choose from a Physics Track or Applied Physics Track. All students are required to pass a written qualifying examination covering the areas of classical mechanics, electromagnetic theory, and quantum physics. This examination is to be taken within two terms of completing at least four core courses, PH 710-711, 750 -751, and 771-772. Under no circumstances may the examination be taken more than twice.

Following satisfactory completion of the qualifying examination and consultation with individual faculty members, the student selects a specific area for dissertation research under the supervision of an appropriate graduate faculty member. The Graduate Study Committee, chaired by the major advisor, will administer an oral examination to test the student's knowledge in the area of research. The student must pass this oral examination in no more than two attempts. Based on the results of the exam, the Committee will outline a program of study including graduate courses such as computer and/or foreign language competency. The types of courses and distribution of credit hours depends on the PhD track chosen. See below for details. With direction from the major advisor, the student should focus on formulating and writing a formal research proposal that must be presented and defended before the Graduate Study Committee; this should lead to a recommendation from the committee for admission to candidacy. Dissertation research culminates in the successful oral defense of the dissertation.

Physics Track: 90 total credit hours

•Twenty semester hours of existing core course work chosen from classical physics, quantum physics, statistical physics, and electromagnetic theory. Two semesters of scientific communications is required.

•Nine semester hours of elective courses in physics

•Directed and Dissertation Research (at least 2 semesters of dissertation research are required to graduate)

Applied Physics Track: total 90 credit hours

•Fourteen semester hours of existing core course work chosen from classical physics, quantum physics, statistical physics, and electromagnetic theory. Two semesters of scientific communications is required.

•Twelve semester hours of elective courses in applied physics

•Three semester hours of applied physics internship

•Directed and Dissertation Research (at least 2 semesters of dissertation research are required to graduate)

Core and elective courses are listed at http://www.uab.edu/physics/graduate/programs-of-study

The following doctoral fellowships are available to the graduate students enrolled in the PhD program in physics at UAB.

NIBIB Supported T-32 Predoctoral Training Grant

National Institute of Biomedical Imaging and Bioengineering (NIBIB) has awarded an interdisciplinary predoctoral training grant to UAB that is entitled "Nanotechnology in Biosensors and Bioengineering". It is a five year program that started on September 1, 2007. Benefits to participating graduate students include: graduate stipends of $25,000 per year, full tuition and health insurance, and a travel award of $1,000 per year. The purpose of this grant is to implement a training program at the interfaces of physics, chemistry, materials science and engineering, and biomedical engineering that will reduce the time from discovery of a new tool in nanotechnology to its application in medical devices, tissue engineering, and biosensors for earliest detection of molecular signatures of disease. For more information regarding this training program, visit **http://www.uab.edu/cnmb/graduate/index.html**.

Department of Education – Graduate Assistantship in the Areas of National Need (GAANN)

The U.S. Department of Education has funded the University of Alabama at Birmingham (UAB) Department of Physics for three years, 2012-2015, to support the department's doctoral students in their academic pursuits. The funding released through the fiscal year 2012 Graduate Assistance in Areas of National Need (GAAN) program, will support five physics Ph.D. students at a stipend level up to $30,000 depending on the financial need of the applicant as assessed by the UAB Office of Financial Aid. The GAANN program also makes an annual institutional payment of $13,552 per student. The project title for the UAB physics program is "Doctoral Fellowships in Nanoscale Materials and Computational Physics at the University of Alabama at Birmingham". This distinctive program will lead to a Ph.D. degree in physics

involving individualized academic course work, closely-supervised research experiences, optional industrial internships, continuous development of pedagogical and communication skills, and comprehensive supervision and evaluation of teaching performance.

Additional Information

Deadline for Entry Term(s):	Each semester Fall
Deadline for All Application Materials to be in the Graduate School Office:	Six weeks before term begins
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)
Comments	GRE General Test is required; in addition, subject test is recommended

For detailed information, contact Dr. Mary Ellen Zvanut, UAB Department of Physics, CH 384, 1530 3rd Avenue South, Birmingham, AL 35294-1170.

Telephone 205-934-4736

E-mail **mezvanut@uab.edu**

Web **www.phy.uab.edu**

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

Physics (PH)

501. **Instructional Astronomy I.** Survey of selected topics in astronomy of the universe, stellar systems, and solar systems, with a focus on preparing to teach. Corequisite: PH501L. 4 hours.

501L. **Instructional Astronomy Laboratory.** Laboratory for PH501. Corequisite: PH501. 0 hours.

502. **Instructional Physical Science.** Lecture and discussion in areas of the physical sciences of importance to basic scientific literacy and to current technology, with a focus on preparing to teach. Corequisite: PH502L. 4 hours.

502L. **Instructional Physical Science Laboratory.** Laboratory for PH502. Corequisite: PH502. 0 hours.

504. **Intermediate Mechanics.** Intermediate treatment of the kinematics and dynamics of classical systems. Presentation of problem solving techniques is emphasized.

505. **Intermediate Electricity and Magnetism.** Intermediate treatment of electricity and magnetism including fields, potentials, induction, Maxwell's equations, circuits. Presentation of problem solving techniques is emphasized.

507-509. **Physical Science for Teachers I-III**. Concepts of physical science. Laboratory includes evaluation of experiments and equipment for lecture demonstrations. Prerequisite: Permission of instructor. 3 hours each.

520, 521. **Introduction to Methods in Theoretical Physics I, II**. Vector calculus. Curvilinear coordinate systems; commonly encountered ordinary differential equations and special functions; complex variables and contour integration partial differential equations, including solutions by Green function methods. Prerequisite: Permission of instructor. 3 hours each.

525. **Applications of Contemporary Optics I**. Applied geometrical optics. Refraction and reflection, paraxial optics, thick lens, matrix theory, optical aberrations, optical systems, and optical design using computer simulations.

526. **Applications of Contemporary Optics II**. Applied wave optics. Fresnel equations, optical interference, optical interferometry, coherence, diffraction, lasers, and Gaussian beam propagation. Prerequisite: PH 525.

527. **Geometrical Optics**. Properties of optical systems. Lenses, mirrors, and stops; aberrations; rays and wave fronts, optical instruments; aspheric components. Lecture and laboratory.

528. **Physical Optics**. Interference and diffraction phenomena; emission, propagation, and absorption of radiation; polarization and dispersion; stimulated emission. Lecture and laboratory.

529. **Applications of Optics III**. Applied optical interactions with materials–linear and nonlinear polarization phenomena, optical properties of materials, anisotropic optics, electro-optics, and nonlinear optics. Prerequisite: PH 526.

532, 533. **Statistical Thermodynamics I, II**. Statistical basis of laws of thermodynamics; ensembles and partition functions; quantum statistics of ideal gases, including photons and electrons; applications to solids, real gases, liquids, and magnetic systems; transport theory. Prerequisites: PH 550. 3 hours each.

545, 546. **Electromagnetic Theory I, II**. Electromagnetic theory approached from standpoint of fields and using Maxwell's equations. 3 hours each.

550, 551. **Introductory Quantum Mechanics I, II**. Principles of quantum mechanics; their application to particle waves, angular momentum, tunneling, radiation, and selection rules; perturbation and variational methods. Prerequisites: PH 351 and PH 562, PH 352 recommended. 3 hours each.

553, 554. **Introductory Solid-State Physics I, II**. Properties of crystal lattices, lattice dynamics, lattice imperfections, and bonding energies; electronic properties of dielectrics, semiconductors, and metals; ferroelectric, magnetic, and optical properties of solids. Prerequisites: PH 331 and PH 551 or equivalent. 3 hours each.

561, 562. **Classical Mechanics I, II**. Kinematics and dynamics, including central forces, rotating coordinate systems, and generalized coordinates; Lagrangian and Hamiltonian. 3 hours each.

567. **Special Relativity**. Foundations and principles of special relativity with applications to mechanics and electrodynamics. Prerequisites: PH 546 and PH 562.

571. **Fundamentals of Spectroscopy**. Explanation of phenomena related to rotational, vibrational and electronic spectroscopy of atoms and molecules; operational principals of spectroscopic tools including diffraction gratins, waveguides, and interferometers; basic group theory concepts and notation. Prerequisite: Modern Physics 351 or equivalent.

575, 576. **Introduction to Biophysics I, II**. Application of physical techniques and analytical methods of selected biological problems. Prerequisite: Permission of instructor. 3 hours each.

581, 582. **Laser Physics I, II**. Physical principles of laser operation and design. Spontaneous and stimulated emission, population inversion, light amplification, laser resonators, Q-switching, mode-locking, pulse shortening techniques, spectral narrowing, and tunable lasers. Individual types of lasers will be considered. Practical applications of lasers will be treated in detail. 3 hours each.

585. **Laser Spectroscopy**. Practical applications of lasers and modern techniques and instrumentation in laser spectroscopy.

587. **Nanoscale Science & Applications**. Physics of electronic, mechanical, and biological properties of materials at the nanoscale level approaching one billionth of a meter. Applications of nanoscale materials in electronic, mechanical, and biomedical systems are emphasized. Special tools in synthesis and characterization of nanomaterials are discussed.

590. **Experimental Methods.** Design and operation of experimental systems for use in teaching laboratories. 3 hours.

591-593. **Advanced Physics Laboratory I-III**. Laboratory investigation of topics of modern physics. Prerequisite: Permission of instructor. 1-3 hours each.

610, 611. **Classical Mechanics**. Applications of methods of LaGrange, Hamilton, Poisson, and Hamilton-Jacobi to such classical problems as central force, small oscillation, and rigid body motions. Prerequisite: PH 562. 3 hours each.

623, 624. **Modern Optics I, II**. Classical and modern theories of propagation of radiation, interference, diffraction, and dispersion; optical devices, including lasers, holograms, sources, and detectors. 3 hours each.

635. **Statistical Mechanics**. Interpretation of macroscopic phenomena from microscopic principles; fundamental laws of statistical mechanics; applications to simple equilibrium systems, phase transitions, and transport problems. Prerequisite: PH 551.

650, 651. **Electromagnetic Theory I, II**. Boundary value and Green function methods for solving potential problems; fields in dielectric, magnetic media, and radiation fields. Prerequisite: PH 546. 3 hours each.

653, 654. **Solid-State Physics I, II**. Structure and dynamics of solids; optical, magnetic, and transport properties. Prerequisites: PH 553, 554. 3 hours each.

655. **Advanced Solid-State Laboratory**. Thin film X-ray diffraction, Raman spectroscopy in materials characterization, electron paramagnetic resonance, and thin film deposition. Prerequisite: PH 351.

671, 672. **Quantum Mechanics I, II**. Discrete and continuous spectra; central force problems; angular momentum and spin; systems of identical particles; perturbation theory; scattering theory. Prerequisites: PH 550, 551. 3 hours each.

673. **Applications of Quantum Mechanics**. Scattering theory, density matrix, and polarization; applications to atomic and nuclear reactions. Prerequisites: PH 671, 672.

697. **Special Topics in Physics**. Topics of current interest, such as theoretical physics, computational physics, experimental techniques. May be repeated for credit. 1-12 hours.

698. **Nonthesis Research**. May be repeated for credit.

699. **Thesis Research.** May be repeated for credit. Prerequisite: Admission to candidacy. 1-12 hours.

710, 711. **Advanced Classical Mechanics I, II**. Analysis of dynamics, including rigid body motion, featuring the LaGrange formulation, introduction to the Hamiltonian, formulation, Poisson brackets, analyses in nonrelativistic applications. 3 hours each.

715, 716. **Advanced Statistical Mechanics**. Applications of statistical laws to modern topics such as quantum fluids, critical phenomena, and nonequilibrium systems. Prerequisite: PH 533 or PH 635. 3 hours each.

732, 733. **Growth and Characterization of Thin Films I, II**. Basics of vacuum science. Methods of thin film deposition. Nucleation, evolution of microstructure and surface morphology of thin films. Simulation of growth processes. Thin film characterization techniques (SEM/SIM, TEM, SPM, XPS/AES, XRD, optical and mechanical measurements). Laboratory practicum on thin-film deposition and basic characterization of film microstructure and properties. Prerequisites: PH553 and PH554 or permission of instructor. Lecture and laboratory. 3 semester hours each.

740. **Physical Applications of Group Theory**. Point groups, space groups, and applications in atomic, molecular, and solid-state physics.

741. **Mössbauer Spectroscopy**. Theory of nuclear gamma resonance phenomena; experimental techniques; computer fitting of Mössbauer data; application to structure chemistry and properties of nuclei.

742. **Electron Spin Resonance**. Microwave techniques, spin Hamiltonian formalism; applications of ESR to solids.

745. **Molecular Spectroscopy**. Infrared, Raman, and ultraviolet techniques applied to study of molecular properties, including rotation-vibration spectra and spectra of crystalline solids.

750, 751. **Classical Electrodynamics I, II**. Static and time-varying fields in vacuum and in matter, radiation fields, solutions and implications of Maxwell's equation utilizing advanced mathematical methods. Prerequisite: PH 546. 3 hours each.

753, 754. **Advanced Solid State I, II**. Properties of electrons and photons in crystal lattices; electromagnetic interactions with solids; lattice defects. 3 hours each.

760, 761. **Methods of Mathematical Physics I, II**. Vector and tensor analysis; differential and integral equations; Green functions; variational techniques; linear operator theory; Fourier and Laplace transforms. 3 hours each.

762, 763. **Computational Physics I, II**. Numerical techniques for solution of differential, integral, and matrix equations of physics; computer simulations of physical phenomena; optimization problems. Prerequisites: PH 545, 551, and 561.

764-767. **Directed Problems in Computational Physics**. Prerequisite: Permission of instructor. 3 hours each.

771, 772. **Quantum Mechanics I, II**. Discrete and continuous spectra; central force problems; angular momentum and spin; systems of identical particles; perturbation theory; scattering theory. Prerequisites: PH 550, 551. 3 hours each.

773. **Applications of Quantum Mechanics**. Scattering theory, density matrix, and polarization; applications to atomic and nuclear reactions. Prerequisites: PH 771, 772. Spring.

791, 792. **Seminar in Physics I, II**. Topics of current interest in physics, presented by graduate students, faculty, and visitors. Required each term of all full-time graduate students. 1 hour each.

793. **Scientific Communications I**. Scientific writing exercises and recent topics in physics presented by graduate students in order to provide experience in written and oral scientific communicaiton. 1 credit hour.

794. **Scientific Communications II**. Scientific writing exercises and recent topics in physics presented by graduate students in order to provide experience in written and oral scientific communicaiton. 1 credit hour.

797. **Special Topics in Physics**. Topics of current interest, such as group theory, medical physics, computational methods, biological physics, materials physics, optics, and space physics. May be repeated for credit. 1-12 hours.

*798. **Non-dissertation Research**. Prerequisite: Permission of instructor. 1-12 hours.

*799. **Dissertation Research**. Prerequisite: Admission to candidacy. 3-12 hours.

Psychology (Ph.D.)

Director of Behavioral Neuroscience Specialization: *Amthor*

Director of Lifespan Developmental Psychology Specialization: *Biasini*

Director of Medical/Clinical Psychology Specialization (APA Approved): *Cook*

Primary Faculty

Franklin R. Amthor, Professor (Psychology): Neurophysiology and Neuroanatomy of the Visual System

Karlene Ball, University Professor and Chair (Psychology); Cognitive Aging and Driving

Fred J. Biasini, Associate Professor (Psychology); Autism, Developmental Disabilities, and Early Childhood Development

Mary Boggiano, Associate Professor (Psychology); Psychobiology, Eating Disorders, Obesity, and Reward

Olivio J. Clay, Assistant Professor (Psychology); Health Disparities, Cargiving and Social Support

Edwin W. Cook III, Associate Professor (Psychology); Psychopathology, Psychophysiology, and Statistics

James E. Cox, Associate Professor (Psychology); Physiological Psychology, Obesity

Michael Crowe, Assistant Professor (Psychology): Cognitive Aging and Clinical Geropsychology

Eric Gampher, Assistant Professor (Psychology); Visual Perception and Neuroscience

Kristi Guest, Assistant Professor (Psychology); Developmental Psychology, Developmental Disabilities, Social Development

Maria Hopkins, Assistant Professor (Psychology); Developmental Disabilities

Rajesh Kana, Assistant Professor (Psychology); Functional MRI, Autism and Social Cognitive Neuroscience

David Knight, Assistant Professor (Psychology); Neuroscience; Brain Imaging, Learning, Memory, &

Emotion

Jean Ann Linney, Professor (Psychology); Community Psychology, Human Ecology, Prevention Science

Carl E. McFarland, Jr., Professor (Psychology); Cognitive and Developmental Psychology

Jesse B. Milby, Professor (Psychology); Clinical Psychology, Medical Psychology, Behavior Therapy, Addiction Treatment & Outcome

Sylvie Mrug, Associate Professor (Psychology); Child and Adolescent Development and Psychopathology

Alan Randich, Professor (Psychology); Behavioral Neuroscience

Christopher Robinson, Assistant Professor (Psychology); Evolutionary Biology and Psychology; Memory; Cognitive Psychology; Neuroscience; History of Science; Psychology and Art/Music, Cross-Cultural and Social Psychology; and Human Sexuality

Lesley A. Ross, Assistant Professor (Psychology); Lifespan Developmental Psychology, Cognitive Aging, Interventions

David C. Schwebel, Professor and Vice-Chair (Psychology); Child Injury Prevention, Pediatric Psychology, and Child Clinical Psychology

Michael E. Sloane, Professor (Psychology); Visual Perception and Cognitive Neuroscience

Edward Taub, University Professor (Psychology); Medical Psychology, Biofeedback

Diane C. Tucker, Professor (Psychology); Clinical Psychology, Physiological Psychology, Psycho-oncology, Palliative Care

Gitendra Uswatte, Associate Professor (Psychology); Rehabilitation Psychology, Positive Psychology

Rosalyn E. Weller, Associate Professor (Psychology); Neuroscience, Vision, Obesity, and Brian Imaging

Rex A. Wright, Professor (Psychology); Social Psychology, Motivation, and Psychophysiology

Areas of Specialization

The Psychology Graduate Program offers three specialization options to doctoral students: Behavioral Neuroscience, Lifespan Developmental Psychology, and Medical/Clinical Psychology. A terminal master's

degree is not offered. The Medical/Clinical Psychology Specialization is approved by the American Psychological Association.

Behavioral Neuroscience

Study in the Behavioral Neuroscience specialization is designed to prepare students for independent research and teaching in the neurobiology of behavior. Research training is provided by faculty in the Department of Psychology and in the UAB Schools of Medicine and Optometry, who share an interest in the biological basis of behavior. The course of study includes a core curriculum in neuroscience and recognizes the interdisciplinary nature of this field. Students obtain strong backgrounds in behavioral science and in neuroscience and gain expertise in the content and techniques of selected areas of neuroscience as they apply to the study of behavior.

Faculty laboratories are equipped for research in behavior, neuroanatomy, neurochemistry, neuroimaging, neuropharmacology, neurophysiology, and molecular biology. The research interests of the faculty include neuroanatomy and neurophysiology of the visual system; interactions between the central nervous system and the periphery in the control of feeding and energy balance; neural underpinnings of obesity and plasticity in participants in a weight loss program; autism; emotional substrates of conditioned fear; neurophysiology and neuropharmacology of pain.

Lifespan Developmental Psychology

The Lifespan Developmental Psychology doctoral program trains scientists to conduct research to discover and apply basic principles of developmental psychology in an interdisciplinary context and to apply those principles to a variety of problems. Graduates are capable of taking positions in institutions of higher learning, medical schools, research institutions, government agencies, and other research and teaching positions. Research training is provided by the faculty of the Department of Psychology and may occur in collaboration with faculty at the Civitan International Research Center, the Center for Aging, the Center for Applied Gerontology, the Department of Pediatrics, The School of Public Health, and other centers and departments.

The research programs of faculty with interests in lifespan developmental psychology include a wide variety of topics from infancy to the elderly. Much of this research is funded by federal research grants. Research subareas include: developmental disabilities (with special interests in Autism Spectrum Disorders, prenatal development and exposure to toxic substances, early intervention, adolescent psychosocial development and mental health, and how family members adapt to the problems of a child with a disability); adolescence (with special interest in longitudinal studies, interactions between health

and development, alcohol and drug use, predictors of depression and suicide, family and peer relations, those with special health care or education needs); and aging (with special interest in visual-perceptual problems of older adults with low vision, memory skills training with elderly populations, the psychological aspects of chronic illness in the elderly, chronically ill individuals, care giving in families of elderly persons, human factor issues in vision and aging).

Developmental Psychology students must complete a master's thesis. Admission to candidacy for the doctoral degree is based on satisfactory completion of coursework and completion of an area review in the form of a Psychological Bulletin or Psychological Review article. The doctoral degree is awarded upon successful defense of the dissertation.

It is also possible to enroll in the Gerontology Certification Program concurrently with enrollment in the Lifespan Developmental Psychology Program. More information about this program may be found at: http://www.aging.uab.edu/SubChannel/Training/pdf/gep-student-policy-2006.pdf

Medical/Clinical Psychology

The Medical/Clinical Psychology Doctoral Program provides scientist-practitioner training in clinical psychology with an emphasis on investigation and service delivery in a medical setting. It is oriented toward assessment and intervention of behavioral factors associated with disorders, their symptoms and risk reduction, enhanced treatment, prevention, and the enhancement of health. The Program is cosponsored by the UAB School of Medicine.

Coursework, research, and clinical clerkship training are provided by faculty psychologists in the Departments of Psychology, Rehabilitation Medicine, Psychiatry, Neurology, Pediatrics, Surgery (Divisions of Gastric and Cardiovascular Surgery), and Medicine (including Divisions of General and Preventive Medicine, Rheumatology, Arthritis, and Gastroenterology), the Center for Aging, Center for Palliative Care, Sparks Center for Developmental and Learning Disorders, Civitan International Research Center; VA Medical Center, and UAB School of Public Health. In addition, psychologists in several health psychology-behavioral medicine and mental health centers in the community play an active teaching, research, and clinical supervisory role in this program.

Current research programs in which faculty and students are involved include AIDS treatment-- efficacy and compliance; HIV/AIDS--risk reduction; Autism Spectrum Disorder intervention outcome; cardiology--hypertension; cardiovascular surgery--open-heart surgery outcome; pediatric virology--congenital infections and mental development; gastroenterology; gastric bypass surgery, anorexia-bulimia and other eating disorders programs; head injury center--rehabilitation, neurovascular surgery research; epilepsy

assessment and treatment research; cocaine and other drug dependence--treatment, development and evaluation; very low birth-weight project; mental retardation--Down's syndrome parent coping project, Alzheimer's disease diagnosis and caregiver projects; and neuropsychological evaluations for early cognitive decline, competence, and Alzheimer's Disease; brain injury studies of behavioral and medical interventions and of imaging correlates of psychological processes; improving health status and utilization; cardiovascular risk assessment and reduction in minority populations; access to cancer screening and care in underserved populations; Women's Health Initiative Multi-Center Project; assessing and modifying women's cancer and other health risks; and smoking cessation interventions. This is a representative but not exhaustive list.

Most Medical/Clinical Psychology Program faculty research is extramurally funded by private foundations and federal support, especially the Centers for Disease Control and multiple institutes of the National Institutes of Health.

It is possible to enroll in the Master of Public Health degree program concurrently with enrollment in the Medical/Clinical Psychology Program; this requires the approval of both the Medical/Clinical Psychology Clinical Director and the UAB School of Public Health.

Application

The deadline for receipt of a complete application for admission is: **November 30 for the Medical/Clinical Psychology Program; December 6 for the Lifespan Developmental Psychology Program; and January 15 for the Behavioral Neuroscience Psychology Program.** Applications are solicited both from students with bachelor's degrees and from those who may have already completed some graduate study. The GRE General Test is required. The GRE Subject Test in psychology is recommended.

Admission

Admission to the program is highly selective. We follow an Affirmative Action/Equal Opportunity process to ensure applicants are evaluated on their individual merit. Successful applicants usually present scores of at least 600 on both the verbal and quantitative portions of the GRE General Test and a minimum 1,200 overall score (verbal plus quantitative). Minimum grade point averages of 3.2 (on a 4.0 scale) overall, over the last two years and in psychology courses, are required for admission.

Because of the interdisciplinary nature of the Behavioral Neuroscience specialization, students with diverse backgrounds in psychology, biology, and physical science are encouraged to apply. All students are expected to have undergraduate training in psychology, biology, physics, chemistry, and

mathematics. Students not trained in one or more of these areas may be required to make up deficits after enrollment.

Admission to the Lifespan Developmental Psychology specialization requires a solid background in psychology as well as some courses in the life sciences. Research experience is essential. Excellent grades in statistics and mathematics are also valued.

The criteria for admission to the Medical/Clinical Psychology specialization include a minimum of 18 semester hours in psychology courses (specific courses recommended are Introduction to Psychology, Psychological Statistics, Physiological Psychology, Psychology of Learning, and Abnormal Psychology or Psychology of Personality) and a minimum of 18 semester hours in life science courses (courses in chemistry and biology/physiology). Courses in mathematics through calculus and in computer programming are recommended. Students with deficits in any of these areas may be required to take suitable additional coursework before and/or after enrollment. Relevant research or clinical service experiences are considered important indications of the applicant's motivation and commitment to psychology. The relevance of the student's goals and interests to the research-health psychology orientation of the specialty is also an admission consideration.

Advisement

Behavioral Neuroscience students are advised by the Behavioral Neuroscience specialization director in consultation with a graduate program steering committee and by their research preceptors until the dissertation committee is appointed, usually early in the third year of study.

Students accepted in the Lifespan Developmental Psychology specialization are matched with a faculty member who agrees to mentor that student. Therefore, applicants will need to identify faculty members with whom they share research interest and would like to study.

The associate director of the Medical/Clinical Psychology program is the initial Graduate Study Committee (GSC) chair for each student during their first year. Throughout the first academic year the chair will meet with students as necessary to assess their goals, interests, and background, and to provide general advising as needed. As the year progresses, the initial chair and student will nominate faculty to serve as permanent chair and members of the GSC beginning after the first academic year. Thereafter, students are encouraged to suggest changes in their GSC membership to accommodate evolving interests, advising needs, research collaborations, etc.

Curriculum

Behavioral Neuroscience

The curriculum in Behavioral Neuroscience provides a student with advanced training that is broadly based in neuroscience. All students have a plan of coursework that includes Overview of Behavioral Neuroscience (PY 753), a two-semester statistics sequence (PY 716-717), and an ongoing seminar in current research (PY 756). Advanced academic coursework is determined by the student and mentor. Each student must enroll in a research practicum directed by a member of the graduate faculty during each term in residence. The student initially rotates among faculty and laboratories during the first year to obtain breadth in points of view and experimental techniques. Student then chooses a mentor with whom they normally complete the remainder of their research training. Before admission to candidacy, each student must fulfill the pre-dissertation research requirement and pass the qualifying examination. Following acceptance of a proposal for dissertation research, the student is admitted to candidacy. The Ph.D. degree is awarded upon successful defense of the dissertation.

Lifespan Developmental Psychology

Each student in the Lifespan Developmental Psychology specialization is encouraged to develop a systematic line of research that complements that of his or her advisor. With intense exposure to an important aspect of developmental research, the student acquires skills that can be generalized to a variety of problems. Students are required to complete a core curriculum which includes 21 hours of developmental psychology classes, 15 hours of research design and statistics, 9 hours of general psychology and related discipline classes; 6 hours of teaching practicum and teaching; and at least 48 credit hours of research.

Lifespan Developmental Psychology students must complete a master's thesis. Admission to candidacy for the doctoral degree is based on satisfactory completion of coursework and completion of an area review in the form of a *Psychological Bulletin* or *Psychological Review* article. The doctoral degree is awarded upon successful defense of the dissertation.

Medical/Clinical Psychology

The Medical/Clinical Psychology specialization places strong emphasis on integration of biological and behavioral sciences. Research and clinical training require an undergraduate background in both psychology and life science. The program requires continued pursuit of applied skills, biological and psychological skill, and knowledge basic to health psychology research and practice. The curriculum includes three broad areas:

1. Basic biological and psychological knowledge, including cognitive biological and social-emotional basis

of behavior, individual differences, statistics and research methodology, professional issues, and ethics;

2. Professional skill and knowledge, including assessment, intervention, evaluation, and consultation; and

3. Medical psychology.

Students pursue research and a clinical focus on one or more of the several available health psychology areas through advanced scientific and applied coursework, clinical clerkship, and directed research activities that typically culminate in the doctoral dissertation.

Course requirements for the Medical/Clinical Psychology specialization include but are not limited to

1. Statistics and Research Design--a four-course sequence;

2. Clinical Psychological Assessment--a one-year modular course sequence;

3. Psychological Intervention--a four-course sequence;

4. General Psychology--Developmental Psychology (core course for all three programs);

5. Biological Bases--Behavioral Neuroscience (core course for all three programs);

6. Health Psychology--a four-course series, three of which involve choices from alternatives such as neuropsychology, psychopharmacology, psychophysiology, neural bases of behavior, and health psychology, plus elective seminars in fields such as rehabilitation, aging, cardiology, and neuropsychology; and

7. Other Required Courses--Adult Personality & Psychopathology, Professional Issues and Ethics, History & Systems, and Social Psychology.

Additional courses and/or seminars may be taken as electives. The student's advisor may also require additional coursework for a chosen area of emphasis. Courses in many departments of the university are available on an elective basis. Students are required to complete a minimum of 18 semester hours of research and 18 semester hours of clinical clerkship. Students are required to complete a master’s project.

Students in Medical/Clinical Psychology are also required to serve a 12-month internship in clinical psychology in a medical facility. The internship must be in a program outside of UAB and accredited by the American Psychological Association. The PhD is awarded upon successful defense of a dissertation

and completion of internship.

Financial Aid

All students admitted to the Behavioral Neuroscience, Lifespan Developmental Psychology, and Medical/Clinical Psychology specializations may expect to receive financial aid. Sources of support include fellowships and research and teaching assistantships.

Additional Information

For detailed information, contact the UAB Department of Psychology, Campbell Hall, Room 415, 1300 University Blvd., Birmingham, AL 35294-1170.

Dr. Franklin Amthor, Behavioral Neuroscience Specialization Interim Director; Telephone 205-934-2694; Email **amthorfr@uab.edu** ;

Dr. Fred Biasini, Lifespan Developmental Psychology Specialization Director; Telephone 205-934-2610; Email psych-lifedev@mail.ad.uab.edu ; Web http://crag.uab.edu/developmental/;

Dr. Edwin Cook, Medical/Clinical Psychology Specialization Director; Telephone 205-934-3850; **medpsych@uab.edu** ; Web **http://www.uab.edu/psychology/**

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit.

Psychology (PY)

698. **Premaster's Degree Graduate Research**. 1-3 hours.

699. **Master's Thesis Research.** Prerequisite: Admission to candidacy. 1-6 hours.

701. **Professional Issues and Ethics in Psychology**. APA ethical code, manual for service providers in psychology, state and national mental health codes and trends for service providers; ethical practices in research with human subjects. APA organizational structure. 1 hour.

702. **History and Systems of Psychology**. Major schools of psychology; influential figures in psychology.

703. **Theories of Personality**. Survey of theories of personality development and functioning.

704. **Social Psychology**. Interpersonal relationships and effects of social environment on social

perception and human behavior.

705. **Learning Processes**.

706. **Sensory and Perceptual Processes**. Sensory physiology; diagnostic techniques for pathophysiology of sensory systems; human psychophysics and principles of perception.

707. **Cognition**. Attention, memory, learning, and information processing; theoretical issues and evaluation of relevant research.

708. **Developmental Psychology**. Human development from prenatal period to old age. Genetic and environmental determinants of behavior; linguistic, cognitive, intellectual, personality, social, and emotional development.

709. **Theory and Research in Emotion**. Contemporary theories of evolutionary, hereditary, behavioral, semantic, and physiological aspects of emotion.

710. **Seminar in Contemporary Issues in Developmental Psychology**. Weekly forum to discuss issues related to developmental research; ethical issues; professional issues. 1 hour.

711. **Seminar in Cognitive Development**. Seminar in the development of memory, perception, learning, and thinking throughout the lifespan.

712. **Seminar in Social Development**. Theoretical models and empirical findings.

714. **Developmental Aspects of Sensation and Perception**. Theoretical models and empirical findings; life span development of sensory capabilities.

715. **Seminar in Emotional Development**. Contemporary topics in the development of emotional responsivity, attachment, perception, and expression.

716. **Introduction to Statistics and Lab**. Probability, descriptive statistics, sampling distributions, null hypothesis testing, comparisons between means; tests on categorical data, bivariate and multiple regression.

717. **Applied Statistical Methods and Lab**. Univariate analysis of variance and factorial designs; interpretation of data from multifactor experimental designs.

718. **Research Design and Lab**. Traditional and nontraditional approaches; includes univariate and

multifactor experimental designs, quasi-experimental designs.

719. **Multivariate Statistical Methods and Lab**. Multiple regression, multivariate analysis of variance and covariance, canonical correlation, principal components, and discriminant analysis. 720. **Human Neuropsychology**. Structure and function of human brain; human behavior; cognitive functions and personality functions; brain-behavior relationships following neurological impairment.

721. **Neuropsychological Assessment**. Evaluation of various types and locations of brain damage and human mental impairment; assessment applications.

722. **Advanced Human Neuropsychology**. Clinical case study and special topic presentation around patients with specific types of neurocognitive deficits. Assessment, intervention, and new research developments.

723. **Seminar in Abnormal Child Development**.

724. **Motor Control After Stroke and Other Neurological Injuries**. Analysis of motor deficits after stroke and other neurological injuries; the contribution of excess motor disability to these deficits; conceptual basis of constraint induction (CI) therapy; methods of CI therapy; new methods for assessing motor deficits with hands-on training with testing and intervention.

725. **Developmental Research Methodology**. Experimental and correlational, cross-sectional and longitudinal designs; multivariate approaches.

726. **Seminar in Advanced Developmental Psychology**. Advanced issues in developmental research and theory.

727. **Longitudinal Data Analysis (Studies Laboratory)**. Direct experience analyzing large multivariate, repeated-measures data sets from existing longitudinal studies. Methods range from how to track subjects and adjust for missing and mistimed data to ways to model complex development processes and systems.

728. **Seminar in Family Research**. Family systems theory and assessment techniques suitable for parents and children at different stages of life; combining objective and subjective data from multiple sources; recent findings about development within the family context.

729. **Seminar in Adolescent Development.** Theoretical models and empirical findings related to biological, psychological, and sociohistorical changes in adolescent development.

730. **Research Seminar in Cognitive Science.** Current research, theories, and controversies in cognitive science. Seminar topic changes each term. Prerequisite: Permission of instructor. 1 hour.

731. **Health Psychology & Assessment**. Prevention, enhancement, and intervention; environmental factors, marketplace factors, and interpersonal factors.

734. **Current Trends in Medical Psychology**. 1 to 3 hours.

735. **Psychology of Addiction**. Causative and developmental factors and treatment approaches for all types of addictions (nicotine, alcohol, drugs, etc.).

736. **Overview of Cognitive Science.** Cognitive science is the interdisciplinary study of mind and intelligence. This course is a comprehensive overview of the historical and conceptual foundations of cognitive science. No previous courses in cognitive science are needed to participate.

739. **Seminar Contemporary Issues in Clinical Medical Psychology (1)**.

740. **Psychopathology**. Theoretical and research issues in maladaptive behavior; description and classification schemes; theories of etiology and maintenance of psychopathology.

741. **Developmental Bases of Personality and Psychopathology** Major concepts, issues, and methodologies related to the development of personality and psychopathology. Focuses on concepts of temperament, attachment, and identity development, along with their relationships to disorders with antecedents and/or onset in infancy, childhood and adolescence.

742. **Sports Psychology**. Psychological factors in athletic performance. Psychological characteristics of successful athletes; anxiety arousal, motivation, attention, cognition, and imagery.

745. **Neurobiology of Learning**. Introduction of data, phenomena, and theory related to associative learning of behaviors. Discussion of issues related to the neurobiology of nonassociative learning, stimulus encoding, and memory.

750. **Psychopharmacology**.

751. **Human Psychopharmacology**. Neurophysiological underpinnings and clinical applications of psychopharmacology.

752. **Neural and Humoral Bases of Behavior**. Interaction of central nervous system and peripheral mechanisms, endocrine and autonomic nervous systems; relationship to human disorders. Topics vary.

753. **Overview of Behavioral Neuroscience**. Neural systems which control behavior will be studied, incorporating knowledge gained from neurobiological and psychological research. Topics will include synaptic communication, regulating behaviors, learning, memory, sensation and perception, movement, emotions, and psychopathology. Prerequisite: Permission of instructor.

755. **Human Psychophysiology**. Basic and applied research topics.

756. **Research Seminar in Behavioral Neuroscience**. Discussion of current literature and presentation of ongoing research by students in the program. 1 hour.

757. **Topics in Behavioral Neuroscience**. Research and methodology in behavioral neuroscience. Topics vary.

758. **Developmental Psychobiology**. Prenatal and postnatal influences on behavioral and physiologic development; psychobiology of mother-infant interactions during early development; research with human populations, primates, other species.

759. **Neural Information Processing Systems for Sensory Coding**.

760. **Interviewing and Behavioral Observation**. Theory and practice of interviewing and behavioral assessment with adult and child populations. 2 hours.

761. **Behavioral Assessment**. Psychometric and observational procedures, relying largely on behavioral theory, to observe, analyze, and assess human clinical behaviors; development of intervention activities. 2 hours.

762. **Psychological Tests and Measurements**. Test construction, norming, standardization, and sampling procedures.

764. **Psychological Assessment: Cognitive Child & Adult**. Cognitive assessment of children and adults focusing on Wechsler scales, Stanford-Binet, and additional cognitive, academic, memory, and learning tests.

765. **Psychological Assessment: Personality Assessment I**. Objective personality assessment, primarily focusing on Minnesota Multiphasic Personality Inventory. 2 hours.

766. **Psychological Assessment: Personality Assessment II**. Traditional projective techniques, utilizing Rorschach test following Exner's system. 2 hours.

767. **Psychological Assessment: Health Psychology**. Use of multiple health-related questionnaires, tests; indices in assessing health behavior, quality of life; traditional psychological tests in health context. 2 hours.

768. **Advanced Personality Assessment**. Integration of cognitive and personality evaluation techniques in applied clinical practice setting.

769. **Cognitive Behavior Psychotherapy**. A review of theory-driven manualized cognitive-behavioral therapy interventions with emphasis upon what has been found to work best with what types of patients.

770. **Survey of Psychotherapeutic Methods**. Procedures for changing maladaptive behavior. Research and methodological issues, factors common to most therapy, and major therapeutic techniques.

771. **Interpersonal Psychotherapy**. Psychodynamic, humanistic, existential theories of psychotherapeutic intervention.

772. **Behavior Therapy**. Cognitive and more traditional behavioral approaches in intervention in mental health and medical environment.

773. **Behavior Therapy Seminar**. Behavioral theory; new and experimental technology for alteration in human behaviors. 1 hour.

774. **Family Therapy.** Traditional systems theory, intervention strategies, and family dynamics; case examples and group participation.

775. **Advanced Seminar in Psychotherapeutic Methods**. Intervention modalities; research strategies for outcome evaluation. 2 hours.

776. **Child and Adolescent Psychotherapy**. Application of child psychopathology knowledge and intervention with child and adolescent population; theoretical and applied issues of verbal and nonverbal psychotherapy. 2 hours.

777. **Psychotherapy Practice--Shadowing**. Passive exposure to individual and group therapy conducted by faculty clinical psychologists. 1 hour.

778. **Psychotherapy Practice--Initial**. Initial active exposure to individual and group therapy supervised by faculty clinical psychologist. 2 hours.

780. **Rehabilitation Psychology**. Rehabilitation of chronic physical disorders; neurological disorders

such as cerebrovascular disease, head trauma, and spinal cord injury.

781. **Forensic Psychology**. Interface between psychology and law; civil and criminal procedure; expert witness; insanity, competency, commitment, and malpractice. Experience in criminal justice settings. 2 hours.

782. **Anxiety and Anxiety-Based Disorders**. Behavioral syndromes within traditional mental health area and in variety of medical populations. Includes phobias and anxiety-based medical and nonmedical disorders.

783. **Developmental Disabilities**. Mental retardation, learning disabilities, and other developmental disorders. Research on nature of disabilities and major intervention techniques.

784. **Organizational Psychology**. Behavioral responses to, or correlates of, organizational structures and processes.

785. **Psychology of Aging**. Age differences in perception, memory, intelligence, personality, adjustment, and psychopathology.

786. **Seminar in Aging**. Contemporary topics in aging, including basic science, clinical, and psychosocial issues. 1 hour.

787. **The Dynamics of Pain**. Comprehensive study of physiology, pharmacology, and anatomy of acute and chronic pain. Emphasis on how medical treatments relieve pain. Topics include: stress-induced analgesia, transcutaneous electrical stimulation, acupuncture, inflammation, and psychological approaches to the treatment of pain.

788. **Pediatric Psychology**.

789. **Social/Ethnic Issues in Therapy**.

790. **Internship in Clinical Psychology**. 9 hours.

791. **Special Topics in Psychology**. 1-3 hours.

793. **Cognitive Neuroscience**. Prerequisite: Permission of instructor.

796. **Practicum in the Teaching of Psychology**. 1-3 hours.

797. **Clinical Practicum in Medical Psychology**. 1-3 hours.

798. **Predoctoral Degree Graduate Research**. 1-3 hours.

799. **Doctoral Dissertation Research**. Prerequisite: Admission to candidacy. 1-6 hours.

Public Administration (M.P.A.)

Degree Offered: M.P.A.

Director: Dr. Akhlaque Haque

Phone: (205) 934-2339 or (205) 975-3413

E-mail: **mpa@uab.edu**

Web site: **http://www.uab.edu/mpa**

Faculty

Janet M. Bronstein, Professor (Health Care Organization and Policy): Health services utilization, health policy, community-based organizations; Co-coordinator of M.P.A.-M.P.H. degree program, School of Public Health.

Nevbahar Ertas, Assistant Professor (Government): Public policy, public and nonprofit budgeting, research methods, program evaluation.

Wendy Gunther-Canada, Professor (Government): Political theory and philosophy, women in public administration, women and politics, administrative ethics.

Akhlaque U. Haque, Associate Professor (Government): Public administration theory, administrative ethics, geographic information systems (GIS), information management, technology and governance, health policy.

Sunjoo Kwak, Assistant Professor (Government): Public budgeting and finance, strategic planning, state and local government administration, administration theory and behavior.

Timothy Smith, Instructor (Government): Public administration theory, public law, human resource

management and health policy.

Cole Taratoot. Assistant Professor (Government): Administrative law, judicial politics, constitutional law, quantitative analysis.

Adjunct Faculty

Kyle Crider, MPA, LEED. Manager, Education Corporation of America. Information management in government.

Sam Gaston, MPA. City Manager, Mountain Brook: City and county management, state and local government.

Ellyn Grady, MPA. Senior Vice President, Agency Impact and Resource Development, United Way of Central AL: Nonprofit management.

Erin Melaney, MPA. Development Director, Girls Inc. of Central Alabama: Fundraising and marketing.

Joseph Packa, MPA. Service Area Executive (retired), American Red Cross Southeast Area: Grants management, strategic planning,

Randy Robertson, MPA. City Manager, Vestavia: Crisis management, human resource management.

MPA Program Mission

In line with the mission of the University, the MPA program is committed to excellence in graduate education through teaching, research and service. The program focuses on building the next generation of responsible decision makers by enhancing their intellectual capacities through knowledge and skills provided within the NASPAA-based MPA curriculum. The Master of Public Administration Program prepares individuals for positions of leadership in the public and nonprofit sectors. It is a professional graduate degree for both pre-career students and in-service administrators. The program is designed to develop the insights and skills needed to plan and formulate policy, and to organize, manage, and implement programs and operations. The MPA program is accredited by the National Association of Schools of Public Affairs and Administration (**NASPAA**). Its Board of Advisors consists of internal and external stakeholders comprised of community members, alumni and students.

The MPA curriculum is designed to ensure that students achieve competency in five domains:

To lead and manage in public governance;

To participate in and contribute to the policy process;

To analyze, synthesize, think critically, solve problems and make decisions;

To articulate and apply a public service perspective;

To communicate and interact productively with a diverse and changing workforce and citizenry.

Degree Requirements

Students in the MPA program must complete a total of **39 semester hours** or the equivalent, with an overall grade average of at least B. The curriculum features a 9 course core sequence, plus 4 specialization/elective courses in either of two tracks; Nonprofit Management (NPM) or Public Management and Planning (PMP). Students without professional public service experience are required to do a three hour internship in addition to required coursework. Previous graduate work at UAB or another NASPAA accredited MPA program may be credited toward the degree if it is directly applicable. Students may select the thesis option or the non-thesis option.

Joint Degree and Certificate Programs

For students who are interested in both public administration and the delivery of public health services, a coordinated **MPA/MPH dual degree** is offered.

For students who are interested in both public administration and the law, a coordinated **MPA/J.D dual degree** is offered

For students interested in criminal justice and public administration a coordinated **MPA/MSCJ dual degree** is offered.

For non-traditional students interested in managing nonprofit organizations the program offers a **Graduate Certificate in Nonprofit Management.** Students seeking admission into the Nonprofit Certificate should apply through Graduate School by visiting the website link here

Admission Requirements

Because of its multi-disciplinary nature, persons from all undergraduate majors are considered for admission to the program. pplicants must take the Graduate Record Examination (GRE) and submit scores.
The following are eligible for a GRE Waiver:
Students with a graduate degree from an accredited college or university.
Students with at least 5 years professional, full-time, progressively responsible public sector or nonprofit career experience. The Statement of Interest and resume should provide clear evidence to for this waiver.

The LSAT may be substituted for the GRE only by JD/MPA applicants. Standardized GMAT score may be substituted at the discretion of the Program Director.

**IMPORTANT Applicants who are applying for a waiver or substitution of other test scores must contact the MPA Director for the official approval. The applicant should submit a formal request accompanied by

a resume to the MPA Program Director via postal mail or email attachment.
Two letters of reference are also required. Application for admission should be made online through the UAB ApplyYorself**Online official UAB Graduate School's admission site.** Admissions will be made fall and spring semester. Deadlines for submitting application for admission are listed on the UAB Graduate School website.

Additional Information:

Deadline for Entry Term(s):	Each semester
Deadline for All Application Materials to be in the Graduate School Office:	Fall: July 1 Spring: November 1
Number of Evaluation Forms Required:	Two
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.). GRE waived for senior professional. See guidelines above.

Financial Aid

The Department of Government has a limited number of graduate assistantships awarded on a competitive basis, which can be awarded during any semester as vacancies occur. The Department has two scholarships which are awarded on a competitive basis each spring. Other financial resources are available through the Office of Student Financial Aid.

Curriculum

A total of 39 hours are required to complete the MPA program. For pre-career students an additional 3 credit hours of internship (20 hours/week) is also required. A full time student, taking 3 courses per semester, plus one additional course over the summer, should be able to complete the program within two years. All courses are offered in the evenings to accommodate working professionals.

Core Courses: All students are required to take the following nine courses:

MPA 600 Administrative Ethics

MPA 601 The Public Policymaking Process

MPA 602 Administrative Theory and Behavior

MPA 603 Public Budgeting

MPA 604 Human Resources Management

MPA 605 Information Management for Government

MPA 606 Foundations of Public Administration Research

MPA 607 Quantitative Methods for Public Administration*

MPA 697** Graduate Research Paper (Capstone) or Portfolio Management*

*Pre-requisite MPA 606 (Foundations of Public Administration Research)

**Should be taken last term. Not required for students pursuing thesis option
*** Effective in 2012-13.

Specializations

Students should select a specialization based upon their career goals and interests. The specializations are **Nonprofit Management or Public Management & Planning**. Students must take three courses in their specialization. In addition to three specialization courses, students must take one elective course. Generalists must take (2) courses from each specialization.

Nonprofit Management Specialization Requirements (choose 3 courses)

Students interested in improving their organizational management, fundraising and grant management skills for nonprofits should select this specialization. This specialization prepares students for a wide range of careers within the nonprofit sector including middle and upper management positions, fundraising and development, grant management and program management/evaluation.

MPA 671 Marketing and Fundraising
MPA 672 Nonprofit Management
MPA 674 GIS for Managers
MPA 678 Strategic Planning
MPA 684 Grants Management

Public Management and Planning Specialization Requirements (choose 3 courses)

Students interested in public management or planning should select this specialization. This specialization prepares students for a wide variety of positions including federal, state and local government management, budget and financial management, planning, economic development, community development, program analysis and evaluation.

MPA 662 State and Local Government Administration

MPA 667 Administrative Law PA 678 Strategic Planning

MPA 681 Local Government Planning

MPA 689 Program Evaluation

MPA 682 Economic Development

Elective Courses

In addition to the elective courses listed below, any course from the specialization list can be used as an elective.

MPA 668 Intergovernmental Relations

MPA 664 Women in Public Administration

MPA 665 Crisis Management

MPA 666 City and County Management

Generalist MPA Degree (2 courses from each specialization)

As an alternative to selecting one of the above specializations, students may pursue a generalist MPA degree. This degree should be chosen if the student desires a broadly based degree and some familiarity with subjects in each of the specializations. Students who desire a public administration education transferable to many different public or nonprofit settings may want to take this course of study. To complete this degree, students must take the core curriculum and at least two (2) required courses from each of the two specializations.

Graduation Research/Portfolio Management Paper and Thesis Options

During the last semester of study, students opting for the non-thesis (Plan II) must register for MPA 697, Graduation Research Paper or Portfolio Management (effective fall 2012), and successfully complete a graduation research paper. Such a paper will require the student to synthesize material learned over the course of the program.

Students taking the thesis option (Plan I) must takes three hours of Independent Study under the guidance of the thesis chair and six thesis hours.

Internships and Placement

Students may apply for an internship placement at any time. A few paid opportunities do arise, although the majority of internships are non-paid. Typical placements are in city and county government, planning departments, public health agencies, social service agencies, state government agencies, and various nonprofit organizations. The Department has placed several students in the prestigious Presidential Management Internship Program, which provides an excellent opportunity for eventual employment in the federal government. Students are also encouraged to use the services of the UAB Student Development Office in the University Center for career planning and placement. The faculty in the program also assists students in job placement. Please **click here** to see what some of our graduates are doing now.

JOINT DEGREE PROGRAMS

Coordinated MPA/MPH Program

The MPA/MPH is designed to train individuals for administrative positions in public health and related health organizations. The Master of Public Administration degree prepares students for careers as administrators in public and nonprofit agencies, and the Master of Public Health provides a background in public health principles and programs. Students must apply and be accepted into both programs, meeting each program's entry requirements. Students are required to complete a total of 60-64 semester hours for the coordinated degree. Core requirements of 21 hours from the MPA program and 39-43 hours from the MPH program are required. Full-time students should be able to complete all degree requirements within three years.

Coordinated MPA/JD Program

The MPA program at UAB and the Cumberland School of Law at Samford University offer a coordinated MPA/JD program. The offering of this dual degree reflects recognition of the complex interrelationship between the legal system, public policy analysis, and public management. It will be particularly applicable to those pursuing careers in government and/or public interest law. Students must apply and be admitted to the MPA and JD programs separately. The requirements for each degree must be met. Close

communication with both programs is required. Depending on prior experience, a field placement may be required.

Coordinated MPA/MSCJ Program

The MPA/MSCJ is targeted toward individuals who wish to gain competencies in public management and the theory/practice of criminal justice. Students must apply and be accepted into both programs, meeting each program's entry requirements. Students are required to complete a total of 60 semester hours for the coordinated degree. Core requirements of 24 hours from the MPA program and 18 hours from the MSCJ program; an additional 12 hours of electives, 3 hours of internship and a 3 hour capstone course are required. Full-time students should be able to complete all degree requirements within three years.

MPA ALUMNI ASSOCIATION

An active alumni association welcomes graduates of the program into membership. The association makes both advisory and financial contributions to the program and seeks to elevate the level of professionalism in public administration through a variety of projects and services.

Course Descriptions

Public Administration (MPA)

600. **Administrative Ethics**. Theories and principles of ethics. Understanding ethical issues and use of ethical principles in resolving ethical dilemma in public organizations. . 3 hours.

601. **The Public Policymaking Process**. Public policy as a decision-making process. Examines environmental and organizational factors, the choice of alternatives, and the implementation and evaluation of public policy, with applied references to specific functional areas, e.g., housing, pollution, energy, and transportation. 3 hours.

602. **Administrative Theory and Behavior**. Theories of organization, management, and administration. Examines both institutional and behavioral elements of organizations as they apply to public, private, and nonprofit agencies. Covers administrative and organization behavior, decision-making and democratic values, along with a treatment of bureaucratic practices and behavior. 3 hours.

603. **Public Budgeting**. Examines the institutions, principles and techniques of governmental budgeting, including the practices and fundamental concepts of public budgeting, the budgeting process and financial management. 3 hours.

604. **Human Resources Management**. Examines the major concepts, theories, procedures and themes needed for effective management of human resources in the public and nonprofit sectors. Emphasis is on

the urban and sub-national settings. Topics may include merit and civil service systems, organized public labor, recruitment, classification, performance appraisal, disciplinary and grievance procedures, training and staff development, diversity and anti-discrimination policy and strategies, ethics/morality and personnel law. 3 hours.

605. **Information Management for Government**. Theory and applications of information management, technology applications and policy. Focus is on social, organizational, political and constitutional impacts of information today. Emphasizes policy and applications related to building knowledge economy, E-government applications and geographic information systems. 3 hours.

606. **Foundations of PA Research**. An introduction to research methodology presenting quasi-experimental and experimental research designs, exposition of qualitative and basic survey methods, and basic data analysis. 3 hours.

607. **Quantitative Methods for PA**. Using a pragmatic and applied approach, this course introduces statistical techniques used to analyze data in the social sciences including simple and multiple regression and nonlinear models. Pre-requisite MPA 606. 3 hours.

662. **State and Local Government Administration**. This course is designed to introduce students to the study of state and local government administration. Introduces keys concepts related to state and local government political structures and institutions; regional, state and county economic performance and state/local government finance. 3 hours.

664. **Women in Public Administration**. Studies in the leadership of women in public service. Focus on theoretical and professional development of women in government and nonprofit administration. 3 hours.

665. **Crisis Management**. Management and coordination of institutions to respond, plan, and mitigate crises. Focus on the role of managers in managing short and long term crises. 3 hours.

666. **City and County Management**. Study of the typical nature of local government and the importance of local-state-federal relations, regional cooperation, and the nonprofit and public-private partnership in providing local government services. 3 hours.

667. **Public and Nonprofit Law**. Explanation of law in society and the legal setting of public administration. Examination of substantive areas of the study of law including regulatory process, administrative adjudication, the administrative procedures acts, administrative due process, judicial review, liability, and citizen's rights. 3 hours.

668. Intergovernmental Relations. The various relations among governments in the U.S. system. Focuses on understanding the interactions, attitudes, and behavior of elected officials and bureaucrats of two or more units of government functioning in their public capacities. 3 hours.

671. **Marketing and Fundraising**. The use of marketing and fundraising strategies for nonprofits. Incorporates both theory and practice as students learn the fundamentals of marketing and resource development and apply them to hands-on projects.

672. **Nonprofit Management**. The day-to-day challenges faced by managers of nonprofit agencies, including the challenge of fund raising, balancing competing values as related to efficiency, effectiveness, and equity. 3 hours.

674. **GIS for Managers**. Examines the use of Geographic Information Systems (GIS) using GIS software. It integrates theory and socioeconomic applications of GIS in the public and nonprofit sector. 3 hours.

678. **Strategic Planning**. Presents the strategic planning process as it is utilized in contemporary settings. Focuses on how the strategic planning process is applied in the public, private, and nonprofit sectors. 3 hours.

681. **Local Government Planning**. This course examines the historical roots of modern land use planning and explores contemporary issues in planning such as sprawl and smart growth. 3 hours.

682. **Economic Development.** Understanding of market forces combined with non-economic variables that influence economic development process. Focus on theories and practical applications of local economic development and its processes**. 3 hours.**

684. **Grants Management**. Covers the essentials of grant-writing and the management of grants. 3 hours.

689. **Program Evaluation**. Analytic tools for evaluating public and nonprofit programs and services. 3 hours.

693. **Internship in Public Administration**. Supervised field placement in public or nonprofit agency for directed work experience arranged by the MPA Director and as per the guidelines in the internship manual. 3 hours.

695. **Special Topics in Public Administration**. Special topics seminar based on the research and substantive interests of the MPA faculty and students. 3 hours.

696. **Independent Study in Public Administration**. One-on-one learning experiencebetween student and an instructor. Permission of Program Director required. 1 - 6 hours.

697. **Graduation Research Paper**. Graduation Research Paper- Capstone project. Permission of Program Director required. 3 hours.

698. **Internship in Public Administration**. Supervised field placement in public or nonprofit agency for directed work experience arranged by the internship coordinator and as per the guidelines in the internship manual. Permission of Program Director required. 3 hours.

699. **Thesis Research**. Credit for research and writing of thesis. Permission of Program Director required. 3-6 hours.

Contact Information

For additional information refer to the web site of the UAB MPA program: www.uab.edu**/mpa**. Inquiries concerning program admission or other questions about the program should be directed to the MPA Program Program Coordinator:

Dr. Timothy Smith

MPA Coordinator

Graduate Studies in Public Administration

Department of Government

University of Alabama at Birmingham

HHB 415, 1530 3rd Avenue South

Birmingham, Alabama 35294-3350.
Telephone (205) 934-2339 or (205) 975-3413; Email: **mpa@uab.edu**

Sociology (M.A.), Medical Sociology (Ph.D.)

Degree Offered: M.A., Ph.D. in Medical Sociology

Director: *Dr. Patricia Drentea*

Phone: (205) 934-2562

E-mail: pdrentea@uab.edu

Web site: http://www.uab.edu/sociology/graduate-programs

Primary Faculty

Elizabeth Baker, Assistant Professor (Sociology), Demography, Immigration, Quantitative Methods, Children and Adolescents, Family.

Jeffrey Michael Clair, Associate Professor (Sociology); Medical, Social Psychology, Ethnography, Applied, Sociological Practice.

William C. Cockerham, Distinguished Professor and Chair (Sociology); Medical Sociology, Theory, Mental Health, International Aspects of Health

Shelia R. Cotten, Professor (Sociology); Information and Communication Technologies, Mental Health, Medical Sociology

Patricia Drentea, Associate Professor (Sociology); Family, Gender, Aging, Methods

Sean-Shong Hwang, Professor (Sociology); Statistics and Methodology, Demography, Human Ecology and Urban Sociology

Irena Stepanikova, Assistant Professor (Sociology); health and health care, physician-patient communication, disparities, social psychology.

Gail Wallace, Assistant Professor (Sociology) Race, Class and Gender, Urban Sociology,

Affiliated Faculty

Michael Flannery, Associate Director for Historical Collections, Lister Hill Library

Julie Locher, Associate Professor (Center for Aging, Medicine, Gerontology, Geriatrics and Palliative Care)

Michael Morrisey, Professor (Health Care Organization and Policy); Health Policy

Patricia Sawyer, Associate Professor (Medicine; Center for Aging); Gerontology

Sociology M.A. Program

The Department of Sociology offers two plans (Plan I and Plan II) for the M.A. Degree

Requirements for the M.A. Degree (Plan I)

Plan I students pursuing the M.A. degree in Sociology must have been admitted into the Medical Sociology Ph.D. program. To be admitted in good standing, candidates must meet all Graduate School admission requirements.

Plan I applicants lacking 18 semester hours in social science courses will be evaluated individually for academic deficiencies. Supplemental coursework may be recommended by the graduate faculty.
The program provides a Plan I (thesis) option. The M.A. degree is conferred upon the fulfillment of the requirements outlined below.

All of the following core courses are required for all students:

SOC 701	Introduction to Sociological Research Methods
SOC 703	Regression Analysis
SOC 705 or SOC 711	Quantitative Methods/Qualitative Methods
SOC 720	Classical Theory
SOC 722	Contemporary Theory
SOC 702 (3 continuous semesters)	Proseminar on the Profession

2 or more substantive courses (these may be in areas outside of Sociology, subject to approval by the Sociology graduate program director)

Additional requirements for the Plan I M.A. degree include the following:

- 6 semester hours of thesis research (SOC 699);
- an acceptable research-based thesis; and
- a final oral examination based on the thesis.

Medical Sociology Ph.D. Program

This program is designed to provide students with the coursework and research experiences to become leading researchers and practitioners in medical sociology. Doctoral training in medical sociology exposes students to the central issues of the field through a variety of methodological techniques encompassing

both qualitative and quantitative approaches. Graduate students study the social and cultural bases of health beliefs and behaviors, organizational structures of health care delivery, and patient-practitioner relationships, to name just a few examples. Students acquire expertise in theory formulation and data analysis.

There are abundant opportunities for graduate students to work with faculty on research projects in medical settings across the campus.

Admission

Admission to the Ph.D. program in medical sociology generally requires a minimum overall score of 1150 on the GRE (verbal and quantitative); minimum GPA of 3.0 (A = 4.0), or a 3.2 GPA for the last 60 semester hours in a B.A. or B.S. program; and minimum GPA of 3.5 in all previous graduate coursework. Students should have completed at least 18 hours in social science courses, including social theory, statistics, and research methods. Students entering the program with a master's degree can receive up to 12 hours of transfer credit that were not used for any other degree program (see graduate school guidelines). They also have waived 6 credits of SOC 699 (thesis research credits). Because of the interdisciplinary nature of the Medical Sociology Ph.D. program, students with diverse backgrounds in social science and health-related fields are encouraged to apply. Students lacking adequate backgrounds in theory, research methods, or statistics may be required to make up deficits after enrollment.

Advising

The Graduate Director and/or the student's faculty mentor will provide continuous advisement on academic progress during the student's graduate study, including assistance with course selection and recommendations for research experiences that are consistent with the student's developing interests and abilities. In addition, each year the student will be formally evaluated by the Graduate Committee and will be provided with performance feedback.

Research supervision is provided by faculty whom students select to chair the master's thesis and doctoral dissertation committees. Typically, the student will select persons with whom a close, supportive relationship develops.

The placement of Ph.D. students in research sites within the Department and/or in areas across campus is an important part of the Medical Sociology Program. Such placements usually involve assisting faculty on research grants. Such experiences provide students with invaluable real-life exposure to medical sociology "in action." As such, they are important accompaniments to the coursework of the Ph.D. program. Teaching and research positions are offered to students based on department needs, funding available and student merit.

Curriculum

The components of the Ph.D. program are as follows:

1. Required Coursework

Medical Sociology Core (9 hr)

Required:

SOC 780	Medical Sociology

2 of 5 Required Electives:

SOC 734	Global Health
SOC 735	Special Topics in Global Health
SOC 755	Race and Health
SOC 756	Gender and Health
SOC 775	Place and Health
SOC 781	Sociology of Health and Illness
SOC 783	Health Care Delivery Systems
SOC 785	Family and Health
SOC 786	Health Disparities
SOC 787	Sociology of Mental Health
SOC 788	Social Medicine

Theory Core (6 hr)

Required:

SOC 720	Classical Theory
SOC 722	Contemporary Theory

Statistics and Research Core (15 hr)

SOC 701	Introduction to Sociological Research Methods
SOC 703	Regression Analysis
SOC 704	Categorical Data Analysis
SOC 705	Quantitative Methods
SOC 711	Qualitative Methods

Research Hours

Master's Thesis Research Hours (6 hr)
Doctoral Dissertation Research Hours (24 hr)

Sociology/Health Electives/Transfer Credits (30 hr--up to 15 hours outside department)

Proseminars (3 hr)

Proseminar, SOC 702 - 1 hr Fall Research
Proseminar, SOC 702 - 1 hr Spring Professionalization and Proposals
Proseminar, SOC 702 - 1 hr Summer Teaching

*students may take up to 3 790-793 classes for credit as electives.

*students may take 2 in-department online courses towards their degree

2. Graduate Proseminar Functions

The graduate proseminar series (SOC 702) is required of all entering doctoral graduate students for their initial three terms in the graduate program. These classes familiarize new students with departmental policies and procedures, as well as various facets of the profession of sociology. This series should not only help students become situated within the graduate program, but also give them an opportunity to become better acquainted with the faculty and graduate student body. Students should also gain experience with basic professional skills such as identifying appropriate journals, creating a curriculum vitae, identifying one's own research interests, developing basic classroom skills, and addressing ethical issues associated with the profession of sociology.

3. The Master's Thesis

Students pursuing the doctoral degree must follow Plan I (Thesis Plan) of the existing master's degree program by producing a research-based thesis, but two types of documents will be acceptable. The first is a traditional thesis organized in the form of an extensive book monograph. This option is especially appropriate for qualitatively based research.

The second acceptable type of document is a manuscript in the standard form of a journal article with appended materials. Specifically, this journal article thesis will consist of: 1) a forward which places the research in context, specifying the journal to which the article is to be submitted, delineating the rationale for co-authorship (if appropriate), and making acknowledgments; 2) a journal article manuscript with a text no longer than the page limitations of a journal selected by the committee, plus footnotes, references, tables, and figures; 3) an appendix with an annotated bibliography of relevant literature; 4) an appendix that details, in full, the methodological procedures; 5) an appendix of measurement instrumentation (e.g., survey instruments, in-depth interview schedules, observational logs, etc.); 6) an appendix of additional tables and/or samples of observational notes, and 7) an appendix of other research documentation such as survey cover letters, human subject review approval forms, and letters of support and approval from facilities at which the research was conducted.

The master's thesis process involves; 1) formation of the thesis committee; 2) oral defense of a written thesis research proposal; 3) oral defense of the completed thesis; 4) submission of the completed manuscript to the Graduate School, and 5) submission of the journal article for publication. The thesis committee consists of a minimum of three full-time faculty members, including one from outside the Department of Sociology. This committee will be responsible for guiding the research process, evaluating the final draft of the thesis, presiding over the oral defenses of the thesis proposal and the completed manuscript, and approving the journal article for submission for publication. In addition to meeting general M.A. degree requirements, before being admitted to candidacy for the M.A. degree, a student in the Ph.D. program in Medical Sociology must have completed the master's level core courses in theory (SOC 707 and 720) and two core methods courses (SOC 701 and SOC 703, or SOC 705 and SOC 711), completed two of the five courses in the medical sociology core, and made a successful oral defense of the thesis proposal.

For those students entering with a master's degree, the student's doctoral advisory committee will review the student's transcript, evaluate course transfers (if any), and devise a course plan. This committee also will handle the student's admission to candidacy and the requirement of submitting a journal article for review. The student with the master's degree will not be required to make oral defenses of his/her thesis work from another institution.

4. Comprehensive Exams

All doctoral students who enter the program in Fall 2010 or later must take a comprehensive examination no later than the end of the third summer after being admitted to the Ph.D. program.

The comprehensive examination should be taken in a specialty area chosen by the student. The specialty area must be a combination of health and one substantive area reflecting the specialties of the faculty (e.g., aging and health, health behaviors, community health, health and demography, health and family, health inequality, health policy, etc.). The advisory committee will consist of three faculty members selected by the Graduate Committee. Prior to taking the examination, the student should meet with the advisory committee to develop a reading list based on the specialty area.

The comprehensive examination will include five questions decided by the advisory committee reflecting major theoretical, methodological, and substantive issues in the student's chosen specialty area. The student will answer four of the five questions as a take-home exam, which will be distributed at 4:00 p.m. Friday and will be due the following Monday at 9:00 a.m. The members of the advisory committee will grade the examination on a pass/fail basis. Students who fail the examination but wish to continue in the program must take a make-up examination in the following Fall Semester. Students who fail the make-up examination will be terminated from the Ph.D. program.

5. The Doctoral Dissertation

The dissertation process is as follows: 1) formation of the dissertation committee; 2) oral defense of a written dissertation research proposal; 3) oral defense of the completed dissertation, and 4) submission of the completed manuscript to the Graduate School. In consultation with faculty, and near the completion of all substantive coursework, a student forms a dissertation committee consisting of at least five members, with two from outside the Department of Sociology. This committee will be responsible for guiding the research process, evaluating the final draft of the dissertation, and presiding over the oral defenses of the dissertation proposal and the completed manuscript. A student is admitted to candidacy after successful oral defense of the dissertation proposal and no earlier than the term in which the required substantive coursework is completed.

Financial Aid

All students admitted to the Ph.D. program will be considered for financial aid. Sources include graduate fellowships and assistantships.

Additional Information

Deadline for Entry Term(s):	Fall

Deadline for All Application Materials to be in the Graduate School Office:	March 1
Number of Evaluation/recommendation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)
Ph.D. Program in Medical Sociology	http://www.uab.edu/sociology/

For detailed information, contact UAB Department of Sociology, HHB 460A, 1401 University Boulevard, Birmingham, Alabama 35294-1152.

Telephone 205-934-2562

E-mail pdrentea@uab.edu

Web http://www.uab.edu/sociology/

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit.

Sociology (SOC)

701. **Introduction to Sociological Research Methods**. Overview of the methodologies used in social science research; major emphases include components of the research process, problem conceptualization, research design, measurement, sampling, questionnaire development, modes of data collection, and ethical issues in both quantitative and qualitative research. Prerequisite: SOC 410 or permission of instructor.

702. **Proseminar on the Profession**. Introduction to the profession of sociology. 1 hour.

703. **Regression Analysis**. Bivariate and multivariate statistical analysis. Prerequisite: SOC 701 or equivalent or permission of instructor.

704. **Categorical Data Analysis**. Analysis with dichotomous, ordinal, and multinomial (polytomous) dependent variables. Topics include contingency table analysis, logistic (logit) models, probit models, Poisson models, negative binomial models, loglinear models, models for counts, and models for limited outcomes. Prerequisite: SOC 701 and SOC 703 or permission of instructor.

705. **Quantitative Methods**. Prerequisite: SOC 703 or equivalent. Developing sociologically important research questions and identifying appropriate strategies to answer these questions in ways that are scientifically valid.

706. **Advanced Longitudinal and Multi-Level Data Analysis.** Topics in advanced longitudinal analysis including techniques such as repeated cross-sections, time series regression, event history analysis, and growth curve modeling.

711. **Qualitative Methods**. Gaining access to research settings; ethnographic field strategies; developing and analyzing field notes; in-depth interviewing and focus groups; the interrelationships between research and thinking theoretically; writing research reports.

712. **Theory Construction**. Logic of constructing theories; issues in the philosophy of science.

713**. Introduction to Applied Sociological Research Methods** (3) – Overview of methodologies used in applied social science research; major emphases include components of the research process, problem conceptualization, research design, measurement, sampling, questionnaire development, modes of data collection, and ethical issues in both quantitative and qualitative research.

714. **Survey Research Methods**. Survey design, sampling, instrumentation, data collection and analysis, and report writing.

715. Program Evaluation (3) – Topics associated with the use of social sciences to evaluate programs, including appropriate measures of quality; selection of evaluation methodology; accuracy, reliability and validity of measures.

716. **Social Stratification**. Theories of inequality; race and ethnic inequality, gender inequality, and international inequality.

720. **Classical Theory**. The major works of classical sociological theorists, including Durkheim, Marx, Weber, and Simmel.

722. **Contemporary Theory**. Recent sociological theories accounting for social conditions in the 21st century, including the work of Beck, Bourdieu, Foucault, Giddens, and the postmodernists.

SOC 725. Applied Sociology (3) – An overview of the field of applied sociology with special attention to current trends and issues in the application of social science in both for-profit and not-for-profit sectors.

SOC 726. Applied Social Psychology (3) – Examination of how social psychological theory and evidence are applied to understanding and addressing social and practical problem on such topics as health, education, criminal justice, community, environment, and diversity.

SOC 727. Applied Sociological Theory (3)**.** 21st century sociological theory at the micro, meso, and macro levels.

SOC 728. Teaching Sociology *(3)* – Using current knowledge about cognition and learning styles to improve classroom techniques for teaching sociology.

SOC 729. Consumer Culture *(3)* – An exploration of theoretical understandings of consumer culture from Georg Simmel to Jean Baudrillard and their application to consumer research.

734. **Global Health**. Cross-cultural, comparative analysis of health and health care delivery systems in both industrialized and developing countries.

735. **Special Topics in Global Health**. Analysis of selected topics in the field of international health and medical sociology.

740. **Deviant Behavior**. Contemporary social psychological theories of deviant behavior; recent empirical findings.

SOC 745. Sociological Practice (3) – Advancing sociologically-informed research and practice, to further public discussion of sociological issues, and to promote the use of sociology to inform public policy.

755. **Race/Ethnicity and Health**. Race/ethnic differences in mental and physical health.

756. **Gender and Health**. Theory and application of gender and health in society.

759**. Social Gerontology**. Structural and behavioral implications of older adulthood; relationship of older adults to political, economic, educational, medical, religious, and other structures in society.

760. **Sociology of Death and Dying**. Sociological, social psychological and existential perspectives on death and dying; recent trends in definition, distribution, and practices surrounding death and dying.

765. Patient Care Relationships and Ethics (3) – The use and potential impact of applied social science research in the delivery of health care services.

770. Practicum in Innovation, Creativity and Applied Sociology (3) – Directed activities that allow students to develop innovative ways to apply social sciences to challenges faced by society, business, and government.

775. **Place and Health**. Population distributions and spatial patterns in cities, the ecology of risk, neighborhood disorder and disadvantage and its impact on the health and wellbeing of populations and individuals.

778. **Demography**. Effect of population processes such as birth, death, migration, and marriage on growth, decline, composition, and distribution of populations.

780. **Medical Sociology**. Theory and research in medical sociology; systematic overview of relevant literature.

781. **Sociology of Health and Illness**. Social causes of health and illness.

783. **Health Care Delivery Systems**. Sociological methods and concepts in health care institutions; health care policy.

785. **Family and Health**. Effects of family structure and family process on health outcomes.

786. **Health Disparities**. Prevalence, causes, and consequences of health and mental health problems for disadvantaged populations; the stratification of service delivery systems

787. **Sociology of Mental Health**. Impact of life events and social supports on depression and other mental disorders; racial minorities, women, elderly, homeless.

788. **Social Medicine**. Socioenvironmental factors in etiology of disease; social movements and health policy; medical ethics and broad ethical issues; place of social science in medical care.

789. Capstone Project (6) – A faculty-directed research project, undertaken at the conclusion of the program, that provides an opportunity to synthesize all previous course material.

790-793. **Seminar in Sociological Substantive Areas**. Prerequisites: Permission of advisor and graduate education director. 3 hours each.

795. **HIV/AIDS and Society**. The social impact of HIV/AIDS in local, national, and international contexts; how society has responded to and changed as a result of HIV/AIDS, including public health surveillance and interventions, policies and funding for prevention/research, and broader cultural changes.

798. **Nonthesis Research**. Mentored research. 1-9 hours.

799. **Thesis Research**. Prerequisite: Admission to M.A. candidacy. 1-6 hours.

798. **Nondissertation Research**. Mentored research. 1-9 hours.

799. **Dissertation Research**. Prerequisite: Admission to Ph.D. candidacy. 1-9 hours

Biochemistry & Structural Biology (Ph.D.)

Director: Dr. Tim Townes

Phone: (205) 934-5294

E-mail: ttownes@uab.edu

Web site: http://www.uab.edu/gbs/structuralbiology/

Faculty

Anupam Agarwal, Professor (Medicine); Regulation of heme oxygenase gene expression in kidney and vascular injury

Stephen Aller, Assistant Professor (Pharmacology/Toxicology)

Christie Brouillette, Research Professor (Chemistry)

Ching-Yi Chen, Associate Professor (Biochemistry and Molecular Genetics)

Igor Chesnokov, Assistant Professor (Biochemistry and Molecular Genetics); DNA Replication, Cell Division, Cell Cycle Regulation

Louise T. Chow, Professor (Biochemistry and Molecular Genetics); Human Papillomavirus, Genetics, Keratinocytes, DNA Replication, Electron Microscopy

Chiqito J. Crasto, Assistant Professor (Genetics)

Lawrence J. DeLucas, Professor (Optometry); Protein Crystal Growth

Gabriel A. Elgavish, Professor (Biochemistry and Molecular Genetics); Paramagnetic Probes for NMR Investigation of Membrane Transport

N. Patrick Higgins, Professor (Biochemistry and Molecular Genetics); DNA Topology, Genetic Transposition, DNA Enzymology

Natalia Kedishvili, Assistant Professor (Biochemistry and Molecular Genetics); Regulation of intracellular levels of bioactive retinoids and steroids in human tissues in health and disease

N. Rama Krishna, Professor (Biochemistry and Molecular Genetics); NMR of Biomolecules, Molecular Endocrinology of Peptide Hormones

Elliot J. Lefkowitz, Associate Professor (Microbiology); Microbial Genomics, Viral Evolution, Bioinformatics, and Biodefense

Nita A. Limdi, Assistant Professor (Neurology)

Clinton D. Lothrop, Professor (Biochemistry and Molecular Genetics)

Jin-Biao Ma, Assistant Professor (Biochemistry and Molecular Genetics)

Diana Noah, Volunteer (Medicine)

James W. Noah, (Biochemistry and Molecular Genetics)

Thomas Norton, Professor (Vision Sciences)

Kirill Popov, Associate Professor (Biochemistry and Molecular Genetics); Multienzyme complexes, Protein kinases, Protein phosphatases, Metabolic control

David G. Pritchard, Professor (Biochemistry and Molecular Genetics); Molecular Basis for the Pathogenicity of Gram-Positive Bacteria

Matthew B. Renfrow, Assistant Professor (Biochemistry and Molecular Genetics)

Gavin Rumbaugh, Assistant Professor (Neurobiology)

Thomas M. Ryan, Assistant Professor (Biochemistry and Molecular Genetics); Gene Regulation, Stem Cells, Mouse Models, Mutagenesis, Cell therapies

David A. Schneider, Assistant Professor (Biochemistry & Molecular Genetics)

Bingdong (Ben) Sha, Associate Professor (Cell Biology); Structure and Function of Molecular Chaperones

Jeffrey B. Smith, Professor (Pharmacology and Toxicology); Ubiquitin proteasome system (UPS) in apoptosis; Escape apoptosis by cancer cells; down-regulation of protein kinaseC by UPS; Orphan receptor triggered by the carcinogenic metal cadmium

Tim M. Townes, Professor and Chair (Biochemistry and Molecular Genetics); Regulation of Gene Expression During Development

Janusz Tucholski, Assistant Professor (Psychiatry and Behavioral Neurobiology)

Charles L. Turnbough Jr., Professor (Microbiology); Bacterial Gene Regulation and Structure/Function of the *Bacillus* anthracis Exosporium

Tino Unlap, Associate Professor (Clinical and Diagnostic Sciences); Biotechnology; Recombinant DNA, Protein Chemistry

Dmitry Vassylyev, Professor (Biochemistry and Molecular Genetics); Crystal structure determination including data collection; modification and improvement of the most widely used crystallographic programs (CCP4, CMS, etc.); and development of original crystallographic software; crystallization of proteins, and protein/protein and protein/nucleic acids complexes

Mark R. Walter, Associate Professor (Pharmacology); X-ray Crystallography; Molecular Recognition; Signal Transduction; Cytokine Structure and Function

Hengbin Wang, Assistant Professor (Biochemistry and Molecular Genetics); Histone modification, in particular, methylation, affects the chromatin-based processes such as transcription

Theme Information

Objectives

Biochemistry & Structural Biology is looking for students who have a strong desire to understand life at the molecular level. Our goal is to teach the skills, implant the inspiration, encourage imagination, and nurture the dedication essential for our graduates to become world-class researchers.

Our faculty and students are dedicated to excellence in both coursework and research programs, and we are honored that our team's accomplishments and discoveries have been chronicled in (Nature, Structure, other names here) and other noted journals and publications of record. New students join a select family of faculty and students who work and study together within the Biochemistry and Structural Biology Theme at UAB. We teach you how to think- what questions to ask and where to search for answers. We give you the skills and background necessary to launch a successful scientific career as an independent researcher.

Whether you choose to pursue advanced studies in molecular genetics, stem cell biology, or many of the diverse areas of research within the Biochemistry and Structural Biology theme, you will find the work interesting, challenging and rewarding. It piques the curiosity, sparks the imagination, enlists your resourcefulness and brings a sense of fulfillment that comes from exciting research and exhilarating discover.

Admission Requirements

The BSB theme encourages applications from students interested in receiving a degree in biomedical sciences. Individuals committed to obtaining a graduate education in biomedical sciences. Applications

are strongly encouraged from individuals with previous work experience, a master's degree in related area, or a professional degree such as the M.D., D.M.D., D.V.M. or O.D.

Applications will be reviewed by the Graduate Biomedical Sciences Admissions Committee. Acceptance will be based on undergraduate performance (both the curriculum and grade point average), letters of recommendation, GRE scores, a personal statement of research interests, performance in other graduate programs or research activities and, if possible, a personal interview.

Acceptance into the BSB theme requires a bachelor's degree including undergraduate coursework in calculus, general and organic chemistry, and at least one introductory course in zoology or biology by the time of entrance.

The general requirements for acceptance into the program are –

• Minimum GPA of 3.0 on a 4.0 scale

• Combined verbal/quantitative score on the GRE of 1100

• A strong background in biology, chemistry, and/or mathematics. Undergraduate level courses in cell biology, biochemistry, developmental biology, and genetics are strongly encouraged. Undergraduate mathematics through calculus and physics are also recommended.

International students must submit scores from the Test of English as a Foreign Language (TOEFL) earned within the last two years. Applicants with scores of 600 (paper-based) or 250 (computer-based) or higher will be considered.

Overview of the BSB Program

Curriculum

YEAR 1

Laboratory Rotations

Three laboratory rotations - 3 months each

Course Work

August 15 - October 31, 2010

10 week GBS Core Course

8:00 a.m. - 10:00 a.m. every weekday

November - December 2010

6 week BSB Laboratory Methods Course

8:00 a.m. - 10:00 a.m. every weekday

(3 wks) Cloning and Expression of Recombinant Proteins, Protein Purification, Mass Spectrometry, NMR Spectroscopy, Crystallography.

(3 wks) Recombineering to produce knockout and knockin vectors, gene targeting in murine ES cells, microinjection of ES cells into blastocysts, genotyping of knockin/knockout mice, reprogramming of skin fibroblasts into induced Pluripotent Stem Cells (iPS).

January - May 2011

Five BSB courses - 1 month each

January - Molecular Enzymology

February - Molecular Genetics

March - RNA Biology

April - Stem Cell Biology

May - Structural Biology

YEAR 2

Choose Thesis Committee - Mentor plus four faculty members

Qualifying Exam on Thesis Project - Written proposal and defense to committee

by May 31 of Year 2

YEARS 3-5

Thesis Research plus 4 Advanced Courses

Additional Information

Deadline for Entry Term(s):	Consult Program Director for information
Deadline for All Application Materials to be in the Graduate School Office:	Domestic Applications: April 15 International Applications: Jan 15
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)

For detailed information, contact:

Ms. Dianne Vickers
Program Coordinator II, UAB
Biochemistry & Structural Biology Theme
720 20th Street South, Kaul 540
Birmingham, AL 35294-0024
Tel: 205.934.0580
Fax: 205.975.2188
E-mail: dvickers@uab.edu

Cancer Biology (Ph.D.)

Director:	Rosa Serra, Ph.D.
	Theresa Strong, Ph.D.
Phone:	(205) 934-0842
E-mail:	cancerbio@uab.edu
Web site:	www.uab.edu/cancerbio

Faculty – ***Note that individual faculty may participate in multiple programs, dependent upon their research interests. The given list is just a small***

representation of a larger faculty base. Please visit www.uab.edu/cancerbio for a complete list of participating faculty.

Edward Acosta, Associate Professor (Clinical Pharmacology); multicenter clinical trials designed to assess the absorption and disposition of antiviral and antiretroviral drugs

Stephen Aller, Assistant Professor (Pharmacology and Toxicology); mechanism and function of integral membrane proteins involved in human disease and the means by which drug molecules and antibodies activate and inhibit function

Daniel Balkovetz, Associate Professor (Cell Biology, Medicine, Microbiology); Epithelial Cell Biology; Epithelial Cell Signal Regulation; Regulation of paracellular transport across epithelial cell tight junctions

Scott Ballinger, Associate Professor (Pathology); Environmental cardiology, free radical biology, mitochondrial function

Stephen Barnes, Professor (Pharmacology & Toxicology), Site-directed mutagenesis of rodent liver bile acid CoA: amino acid N-acyltransferase (BAT) - this project involves a combination of molecular biology, enzymology and protein mass spectrometry; Molecular basis of prevention of eye cataract disease by polyphenol-containing dietary supplements; Site-specific modification of lens proteins by oxidants - this project involves protein mass spectrometry and other physical chemical techniques

Susan Bellis, Associate Professor (Physiology & Biophysics); The Role of Integrin Receptors in Human Biology and Disease

Mark Bevensee, Associate Professor (Neurobiology, Physiology & Biophysics); Cellular and Molecular Physiology of Acid-base Transporters and pH Regulation

Mary-Ann Bjornsti, Professor (Pharmacology and Toxicology); Cancer-based pharmacology and toxicology

Scott W. Blume, Assistant Professor (Biochemistry & Molecular Genetics, Medicine); Specific regulation of gene expression at the translational level - through sequence-specific RNA-binding proteins and complex 5'-untranslated RNA sequences; dysregulation of gene-specific translational control mechanisms in cancer

Steven Carroll, Professor (Cell Biology, Neurobiology, Pathology); The Role of Neuregulin-1 in Peripheral Nervous System Neoplasia

Chenbei Chang, Assistant Professor (Cell Biology); Signaling Transduction in Development and Diseases

Yabing Chen, Assistant Professor (Pathology); Gene Regulation in the Pathogenesis of Cardiovascular diseases, Osteoporosis and Cancer

Gregory A. Clines, Assistant Professor (Endocrinology)

Randall S. Davis, Associate Professor (Biochemistry & Molecular Genetics, Medicine, Microbiology); Lymphocyte development and mechanisms of lymphomagenesis

Qiang Ding, Assistant Professor (Medicine); Molecular mechanisms of organ fibrosis

Isam-Eldin Eltoum, Professor (Pathology); Clinical research in diagnostic cytology and surgical pathology- Tumorogenesis of prostate cancer and chemoprevetion - HPV infection

Isao Eto, Associate Professor, (Nutrition Sciences); Nutritional Biochemistry, Folate Metabolism and Interactions, Cancer Biology and Biochemistry

Maaike Everts, Assistant Professor (Pathology); Gene therapy and nanotechnology

Charles Falany, Professor (Pharmacology & Toxicology); Biochemical and physiological properties of human cytosolic sulfotransferases

Xu Feng, Associate Professor (Pathology); Cell Signaling and Gene Expression Regulation in Bone and Cancer Cells

Stuart J. Frank, Professor (Cell Biology, Medicine, Physiology & Biophysics); Growth Hormone Action and GH Receptor Structure and Function

Andra R. Frost, Associate Professor (Cell Biology, Pathology); Fibroblast-Epithelial Cell Interactions and Developmental Pathways in Breast Cancer

Catherine Fuller, Associate Professor (Physiology & Biophysics); ENaC/ASIC Ion Channels

Vithal Ghanta, Professor (Microbiology); Tumor immunology, immune system and aging, CNS immune system interactions

Yancey G. Gillespie, Professor (Cell Biology, Microbiology); Molecular and Viral Therapy of Malignant Primary Brain Tumors

William Grizzle, Professor (Pathology); Biomarkers in Early Detection, Prognosis, Risk and Therapeutic Outcome; Anatomic and Clinical Pathology; Tissue Resources to Support Biomedical Research; Immunomodulation of Cancer; Aging and Cancer; Post-transcriptional Processing of Genetic Info

Robert Hardy, Associate Professor (Pathology); Cancer cell metastasis

Zdenek Hel, Assistant Professor (Microbiology, Pathology); HIV-1 pathogenesis and vaccine developent. Design of novel strategies for immunotherapy of cancer

Douglas Hurst, Instructor (Pathology); Chromatin regulation of metastasis

Amjad Javed, Assistant Professor (Cell Biology, Pathology); Genetic and Molecular Signaling for Cellular Differentiation and Skeletogenesis

Nirag Jhala, Professor (Pathology); Characterizing utility of endoscopic ultrasound guided fine needle aspiration cytology. Characterizing expression of molecular pathways involved in the development and progression of pancreatic, colorectal adenocarcinoma, hepatocellular caricnoma and cholangiocarcinoma

Kai Jiao, Assistant Professor (Genetics); Hypothalamic Control of Feeding Behavior

Santosh Katiyar, Associate Professor (Dermatology); Prevention of skin cancer by dietary antioxidants

Bob Kesterson, Associate Professor (Genetics); Hypothalamic Control of Feeding Behavior

Helen Kim, Associate Professor (Biochemistry & Molecular Genetics, Neurobiology, Pharmacology & Toxicology); Proteomics of neuroprotective and chemopreventive actions of dietary phytochemicals

Jennifer King, Assistant Professor (Pharmacology and Toxicology); pharmacokinetics and pharmacogentics; multicenter clinical trials designed to assess the absorption and disposition of antiviral and antiretroviral drugs

Peter King, Professor (Physiology & Biophysics); Mechanisms of Growth Factor mRNA Stabilization in Cancer

Christopher Klug, Associate Professor (Biochemistry & Molecular Genetics, Genetics, Medicine Microbiology, Pathology); Hematopoietic Stem Cell Biology and Acute Leukemias

Bruce Korf, Professor and Chair (Genetics); Neurofibromatosis Type 1

Rama N. Krishna, Professor (Biochemistry & Molecular Genetics); Structural Biology and Biomolecular NMR Spectroscopy

Jack Lancaster, Professor (Physiology & Biophysics); The Biophysics and Biochemistry of Nitric Oxide

Aimee Landar, Assistant Professor (Pathology); Cellular effects of post-translational modification of protein thiols by reactive species in cancer and cardiovascular disease

Yi-Ping Li, Professor (Pathology); Understanding the mechanisms of bone formation, bone resorption, skeletal development, craniofacial development and cancer bone metastasis; Developing effective new therapies for treating and preventing the related diseases.

Fang-Tsyr Lin, Assistant Professor (Cell Biology); Mechanisms of the LPA Receptor Actions

Robin Lorenz, Professor (Microbiology, Pathology): Cellular and Molecular Immunology of the Gastrointestinal Tract

Jin-Biao Ma, Assistant Professor (Biochemistry & Molecular Genetics); Structure and mechanism of proteins-RNA recognition in small RNA biogenesis and regulation

Upender Manne, Associate Professor (Anatomic Pathology)

James Markert, Professor (Cell Biology, Physiology & Biophysics); Engineering Herpes Simplex Viruses for the Therapy of Cancer

Michael A. Miller, Assistant Professor (Cell Biology); Function and evolution of intercellular communication mechanisms

Joanne Murphy-Ullrich, Professor (Cell Biology, Pathology); Extracellular Matrix Control of Cell and Growth Factor Function

Thomas T. Norton, Professor (Vision Sciences); Animal Models of Myopia - Retinal Control of Eye Size

John Parant, Assistant Professor (Pharmacology and Toxicology); regulation as well as cause of genomic instability in cancer and other diseases

Boris Pasche, Professor and Director (Cell Biology, Medicine); The role of Transforming Growth Factor Beta (TGF-beta) in cancer development and progression, The biological effects of amplitude-modulated electromagnetic fields, The role of variants of the adiponectin pathway in cancer development

Rakesh Patel, Associate Professor (Pathology); Modulation of Inflammation by Reactive Species

Selvarangan Ponnazhagan, Professor (Pathology); Adeno-associated virus gene therapy

Meredith Preuss, Assistant Professor (Medicine)

Kevin P. Raisch, Assistant Professor (Radiation Oncology);

Matthew B. Renfrow, Assistant Professor (Biochemistry & Molecular Genetics);

Kevin Roth, Professor and Chair (Pathology); Molecular Regulation of Neuronal Cell Death

Ralph D. Sanderson, Professor (Pathology); Role of Heparan Sulfate and Heparanase in Regulating the Tumor Microenvironment

Rosa Serra, Professor (Cell Biology); Mechanism of TGF-ß Action in Developmental and Disease Processes

Bingdong Sha, Professor (Cell Biology); Structural and functional studies of proteins involved in protein folding and translocations

Anath Shalev, Professor (Medicine); Molecular biology of diabetes, beta cell biology, apoptosis, oxidative stress, transcriptional regulation of gene expression, diabetes complications

Sadeep Shrestha, Assistant Professor (Epidemiology); Infectious Disease Epidemiology, Genetic Epidemiology

Gene Siegal, Endowed Professor (Cell Biology, Pathology); Gene therapy of solid tumors

Yuhua Song, Assistant Professor (Biochemistry & Molecular Genetics); Multiscale Modeling in Biology and Biomechanics

Theresa Strong, Associate Professor (Biochemistry & Molecular Genetics, Genetics, Medicine); Identification of Tumor Antigens and Development of Cancer Vaccines

Jianming Tang, Associate Professor (Medicine, Microbiology); Genetic and Epigenetic Correlates of Infection and Immunity

Jaideep V. Thottassery, Assistant Professor (Pathology)

Laura Timares, Assistant Professor (Cell Biology, Pathology); Engineering Dendritic Cells for Immunotherapy

Robert van Waardenburg, Assistant Professor (Pharmacology and Toxicology); Drug interaction, cancer pharmacology

Hengbin Wang, Assistant Professor (Biochemistry & Molecular Genetics); Role of Histone Modification in Chromatin Function

Hui Xu, Associate Professor (Dermatology, Pathology); contact hypersensitivity, mechanisms of elicitation

Yang Yang, Assistant Professor (Pathology); Targeting heparan sulfate for myeloma therapy

Karina Yoon, Assistant Professor (Pharmacology and Toxicology); Drug interaction, cancer pharmacology

Nabiha Yusuf, Instructor (Dermatology)

Majd Zayzafoon, Assistant Professor (Pathology, Physiology & Biophysics); The Role of Calcium Signaling in the genetic and epigenetic pathogenesis of disease

Theme Information

The goal of the Cancer Biology Program is to train the next generation of cancer biologists so that they will make significant contributions to basic and clinical research. Students will receive training over a broad base–integrating molecular, cellular, biochemical and biological experimental approaches. Combinations of courses, seminars, small group discussions and hands-on research provide each student with a customized dissertation experience. Students will have opportunities to work with outstanding investigators throughout the UAB campus in the areas of tumor microenvironment, metastasis, cancer genetics, stem cells, gene therapy of cancer, pharmacology/toxicology, signaling and tumor immunology. Successful graduates will have a firm foundation upon which they can build careers in academia, research institutions, industry or government.

Students are expected to complete the entire program in four or five years. During the first year, students will participate in the GBS core curriculum and will begin more specialized training by exploring potential laboratories in which they may do their dissertation research as well as courses representing the multiple disciplines involved in cancer research. A course focusing on "classic papers" in cancer research will set the stage for modern approaches to studying the disease. Following three laboratory rotations, each

student will select a mentor for his/her dissertation research. Following the core curriculum, students will begin specialized cancer research electives.

During the second year, students will complete their specialized courses and will participate in journal clubs and special topics curricula. After the second year, cancer biology students will write a proposal for their dissertation research and presented to their graduate advisory committee for approval. The focus following advancement to candidacy is hands-on research, although students can elect to participate in other advanced courses that will round out their education or provide opportunities to expand the research.

Admission Requirements

A baccalaureate degree in the natural or physical sciences is required. Undergraduate level courses in organic and analytical chemistry, cell biology, biochemistry and genetics are strongly encouraged. Undergraduate mathematics through calculus and physics are also recommended. See individual Program Admissions information for program-specific required or recommended courses.

The Graduate School recommends that entering students have a minimum grade point average (**>GPA**) of 3.0 on a 4.0 scale and a minimum combined verbal/quantitative score on the Graduate Record Exam (**>GRE**) of 1100. As the scoring system changes with the implementation of the new GRE format, the Graduate School will make adjustments to reflect a minimum total score.

International students must submit scores from the Test of English as a Foreign Language (**>TOEFL)** earned within the last two years. Applicants with scores of 600 (paper-based) or 250 (computer-based) or higher will be considered.

Undergraduate or postgraduate **>research experience** is extremely helpful.

Applications are reviewed by the GBS Admissions Committee, representing all GBS thematic programs. **>Acceptance** will be based on a combination of factors including:

- Undergraduate performance (both the curriculum and grade point average)
- Letters of recommendation
- GRE scores
- A personal statement of research and career interests
- Previous research experience
- Personal interview, at program expense (international applicants may be interviewed by phone or video conference)

Admission to our Programs is very competitive and the number of positions is limited; thus not every qualified applicant can be offered a position.

Financial Support

All students accepted into GBS programs receive a **competitive annual stipend** and **fully paid tuition and fees**. Single coverage **health insurance is also provided** at no cost to the student through VIVA Health UAB.

The annual stipend for the 2011-2012 academic year is $26,000. The total annual award value, including stipend, tuition, fees and health insurance is $37,500. Stipends are reviewed and updated regularly.

First-year students are funded through the Cancer Biology Graduate Program by Graduate School Fellowships and occasionally by other national and University fellowships. In subsequent years, students are supported through their advisor's research grants, institutional funds or training grants. In addition, highly qualified students are encouraged to apply for individual fellowship awards, with the guidance of their advisors. See **Fellowships and Awards** for additional fellowship information and resources.

Additional Information

Deadline for Entry Term(s):	Consult Program Director for information
Deadline for All Application Materials to be in the Graduate School Office:	Domestic Applications: April 1 International Applications: Feb 15
Number of Evaluation Forms Required:	Three
Entrance Tests (University Code: 1856)	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)

For detailed information, contact:

Rosa Serra, Ph.D.
Director, UAB Cancer Biology Graduate Program
205.934.0842 (office)
205.975.5648 (fax)
rserra@uab.edu

Cell, Molecular, and Developmental Biology (Ph.D.)

Director:	Dr. Bradley K. Yoder
Phone:	(205) 934-0994
E-mail:	byoder@uab.edu
Web site:	**www.uab.edu/cmdb**

Faculty

Anupam Agarwal, M.D., Professor; Medicine; Regulation of heme oxygenase gene expression in kidney and vascular injury

G. M. Anantharamaiah, Ph.D., Professor; Medicine; Apolipoproteins, Amphipathic Helices and Atherosclerosis

Daniel Balkovetz, M.D., Ph.D., Associate Professor; Medicine; Epithelial Cell Biology; Epithelial Cell Signal Regulation; Regulation of paracellular transport across epithelial cell tight junctions

Scott Ballinger, Ph.D., Associate Professor; Molecular and Cellular Pathology; Environmental cardiology, free radical biology, mitochondrial function

Marcas Bamman, Ph.D., Associate Professor; Physiology & Biophysics; skeletal muscle mass regulation

Zsuzsanna Bebok, M.D., Associate Professor; Cell Biology; Membrane protein biogenesis in epithelial cells (CFTR as model); Unfolded protein response

David Bedwell, Ph.D., Professor; Microbiology; Mechanism of Translation Termination and Therapies to Suppress Stop Mutations

Etty Beneviste, Ph.D., Cell Biology; Understanding how the immune system and central nervous system communicate with each other.

Bakhrom Berdiev, M.D., Ph.D., Assistant Professor; Cell Biology; The CFTR Chloride Channel control of Epithelial Sodium Channel under physiological and pathological conditions

Mark Bevensee, Ph.D., Associate Professor; Physiology and Biophysics; Cellular and Molecular

Physiology of Acid-base Transporters and pH Regulation

Michael Brenner, Ph.D., Professor; Neurobiology; Molecular Sudies of Astrocytes in Health and Disease

Peter Burrows, Ph.D., Professor; Microbiology; Lymphocyte Development and Function

Chenbei Chang, Ph.D., AssociateProfessor; Cell Biology; Signaling Transduction in Development and Diseases

John Chatham, D. Phil., Associate Professor; Medicine; Cardiomyocyte function and metabolism in diabetes and ischemic heart disease

Ching-Yi Chen, Ph.D., Associate Professor; Biochemistry & Molecular Genetics; Mechanism and Regulation of Mammalian mRNA Turnover

Yabing Chen, Ph.D., Associate Professor; Pathology; Gene Regulation in the Pathogenesis of Cardiovascular diseases, Osteoporosis and Cancer

Igor Chesnokov, Ph.D., Assistant Professor; Biochemistry and Molecular Genetics; DNA Replication and Cell Cycle in Eukaryotes

Louise Chow, Ph.D., Professor; Biochemistry and Molecular Genetics; Human papillomavirus DNA replication and pathogenesis

Sarah Clinton, Ph.D., Assistant Professor; Psych – Behavioral Neurobiology; Neurodevelopmental and environmental factors that underlie susceptibility to anxiety and depression

James Collawn, Ph.D., Professor; Cell Biology; Cystic Fibrosis; Endocytosis; Protein Trafficking

Yingzi Cong, Ph.D., Assistant Professor; Medicine; Host mucosal immune response to commensal bacterial antigens and the pathogenesis of inflammatory bowel diseases

Rita Cowell, Ph.D., Assistant Professor; Psychiatry & Behavioral Neurobiology; Transcriptional regulation of early postnatal brain development: Insights into the pathology of Autism and Schizophrenia

Lawrence DeLucas, O.D., Ph.D., Professor; Optometry; Protein Crystallography/Protein Crystal Growth

Patrizia De Sarno, Ph.D., Assistant Professor, Psychiatry and Behavioral Neurobiology; the role of glycogen synthase kinease-3 (GSK3) in Experimental Autoimmune Encephalomyelitis

Qiang Ding, Ph.D., Assistant Professor; Medicine; Molecular mechanisms of organ fibrosis

Charles O. Elson, III, M.D., Professor; Medicine; Regulation of mucosal immune responses

Charles Falany, Ph.D., Professor; Pharmacology & Toxicology; Biochemical and physiological properties of human cytosolic sulfotransferases

Michelle Fanucchi, Ph.D., Associate Professor; Environmental Health Sciences; Pulmonary cell biology and toxicology. Cell-to-cell interactions in the developing lung as well as in repair after lung injury and disease in children. The role of biochemical defense mechanisms native to pulmonary cells. Childhood lung disease and its etiology. Drug metabolism.

Stuart J. Frank, M.D., Professor; Medicine; Growth Hormone Action and GH Receptor Structure and Function

Andra R. Frost, M.D., Associate Professor; Pathology; Fibroblast-Epithelial Cell Interactions and Developmental Pathways in Breast Cancer

Kohtaro Fujihashi, D.D.S, Ph.D., Professor; Pediatric Dentistry; The Cellular and Molecular Mechanisms for Mucosal Immunity in the Elderly; Molecular and Cellular Mechanisms for the Induction and Regulation of Mucosally Induced Tolerance; A Mucosal Internet Of gd, ab T Cells and Epithelial Cells for Mucosal Immunity

Paul Gamlin, Ph.D., Professor; Vision Sciences; Studies of the Neural Bases of Vision & Eye Movements

Mark Garfinkel, Ph.D., Assistant Professor; Environmental Health Sciences; Drosophila

W. Timothy Garvey, M.D., Professor; Nutrition Sciences; molecular, metabolic, and genetic basis of type 2 diabetes mellitus, insulin resistance, and obesity

James George, Ph.D., Associate Professor; Surgery; Immune regulation of post-transplant vascular disease and allograft rejection

G. Yancey Gillespie, Ph.D., Professor; Surgery; Molecular and Viral Therapy of Malignant Primary Brain Tumors

Alecia K. Gross, Ph.D., Associate Professor; Vision Sciences; Rhodopsin trafficking in rod cells and rhodopsin-mediated retinal degenerations

Lisa Guay-Woodford, M.D., Professor; Genetics; Genetics of renal disease, particularly polycystic

kidney disease

John Hablitz, Ph.D., Professor; Neurobiology; Cellular Mechanisms of Neurotransmission

John L. Hartman, IV, M.D., Assistant Professor; Genetics; Quantitative analysis of genotype-phenotype interaction networks in yeast models of human disease

Hui-Chen Hsu, Ph.D., Associate Professor; Clinical Immunology, Rheumatology; The BXD2 autoimmune mouse model of lupus and erosive arthritis

Amjad Javed, Ph.D., Associate Professor; Oral and Maxillofacial Surgery; Genetic and Molecular Signaling for Cellular Differentiation and Skeletogenesis

Kai Jiao, M.D., Ph.D., Associate Professor; Genetics; TGF-beta/Bmp signaling during cardiogenesis

Rajesh K. Kana, Ph.D., Assistant Professor; Psychology; the neural substrates of social cognition and the impact of social cognition on language, communication and other cognitive functions

Natalia Y. Kedishivli, Ph.D., Assistant Professor; Biochemistry and Molecular Genetics; Regulation of retinoic acid homeostasis

Bob Kesterson, Ph.D., Associate Professor; Genetics; Hypothalamic Control of Feeding Behavior

Jeonga Kim, Ph.D., Assistant Professor, Medicine; Cross-talk between inflammation and insulin signaling

Gwendalyn King, Ph.D., Assistant Professor; Neurobiology; Understanding the difference between pathological and non-pathological brain aging

Kevin Kirk, Ph.D., Professor; Physiology and Biophysics; The CFTR Chloride Channel

Christopher Klug, Ph.D.; Professor; Microbiology; understanding the underlying mechanisms regulating hematopoietic stem cell (HSC) self-renewal and how normal HSC developmental programs are subverted in the context of acute myeloid leukemia (AML)

Adrienne Lahti, M.D.; Professor; Psych – Behavioral Neurobiology; Use of multimodal brain imaging techniques to study the neuropathology of schizophrenia and bipolar disorder and to evaluate the effects of psychotropic drugs on brain function and biochemistry; translational work aiming at bridging human brain imaging and postmortem studies

Jack Lancaster, Ph.D., Professor; Anesthesiology; The Biophysics and Biochemistry of Nitric Oxide

Mathieu Lesort, Ph.D., Associate Professor; Psychiatry; Pathogenesis of Huntington's Disease: from models to therapeutic targets

Xiaohua Li, M.D., Ph.D., Associate Professor; Psychiatry & Behavioral Neurobiology; Neurobiology of mood disorders

Yonghe Li, Ph.D.; Medicine

Rui-Ming Liu, M.D., Associate Professor; Environmental Health Sciences; Glutathione, aging, age-related diseases, fibrosis, cancer

Farah Lubin, Ph.D., Assistant Professor; Neurobiology; Molecular Transcriptional Mechanisms in Learning/Memory and Neurological Disorders

Jin-Biao Ma, Ph.D., Assistant Professor; Biochemistry and Molecular Genetics; Structure and mechanism of proteins-RNA recognition in small RNA biogenesis and regulation

James Markert, M.D., Professor; Surgery; Engineering Herpes Simplex Viruses for the Therapy of Cancer

Joseph L. Messina, Ph.D., Professor; Pathology; Insulin and Growth Hormone (GH) Action, Insulin and GH Resistance Following Trauma and Infection

Michael A. Miller, Ph.D., Associate Professor; Cell Biology; Function and evolution of intercellular communication mechanisms

John Mountz, M.D., Ph.D., Professor; Medicine; Gene Therapy, T-cell Aging, Immunogenetics, and T-cell Imaging

Joanne Murphy-Ullrich, Ph.D., Professor; Pathology; Extracellular Matrix Control of Cell and Growth Factor Function

Diana Noah, Ph.D., Research Virologist; Biochemistry/SRI; understanding of influenza virus pathogenesis, including the mechanisms utilized by the highly pathogenic avian influenza strains causing deaths throughout Asia

Thomas T. Norton, Ph.D., Professor; Vision Sciences; Animal Models of Myopia – Retinal Control of Eye

Size

Susan Nozell, Ph.D., Assistant Professor; Cell Biology

Michelle L. Olsen, Ph.D.; Assistant Professor; Physiology & Biophysics; Glial potassium channels and glutamate transporters in injury and abnormal development

Suzanne Oparil, M.D., Professor; Medicine; Molecular and Cellular Mechanisms of Cardiovascular Disease

Vladimir Parpura, M.D., Associate Professor; Neurobiology; The role of glial cells in physiology of nervous system

Boris Pashe, M.D., Ph.D., Professor; Medicine; common gene variants that impact cancer risk and other outcomes in breast and colorectal cancer patients

Andrew J. Paterson, Ph.D., Assistant Professor; Medicine; the regulation of growth factor gene expression

Ji-Bin Peng, Ph.D., Associate Professor; Medicine; Calcium transport proteins and their roles in health and disease

Selvarangan Ponnazhagan, Ph.D., Professor; Pathology; Adeno-associated virus gene therapy

Kirill M. Popov, Ph.D., Associate Professor; Biochemistry and Molecular Genetics; Regulation of pyruvate dehydrogenase complex

Edward M. Postlethwait, Ph.D., Professor; Environmental Health Sciences; Environmental Induction of pulmonary epithelial injury

Lucas Pozzo-Miller, Ph.D., Associate Professor; Neurobiology; Neurotrophins, Ca2+ Signaling, Synapse Development and Plasticity, Mental Retardation, Rett Syndrome

Peter Prevelige, Jr., Ph.D., Professor; Microbiology; Structural Biology of Viral Assembly and Infection

Chander Raman, Ph.D., Associate Professor; Medicine; Lymphocyte activation, immune tolerance and autoimmunity tolerance and autoimmunity

Erik Roberson, M.D., Ph.D., Assistant Professor; Neurology; Neurobiology of Alzheimer's Disease and

Frontotemporal Dementia

Tom Ryan, Ph.D.; Associate Professor; Biochemistry & Molecular Genetics; Stem cell therapies in animal models of human disease

Ralph D. Sanderson, Ph.D.; Professor; Molecular & Cellular Pathology; Molecular regulation of the tumor microenvironment

James Schafer, Ph.D., Professor Emeritus; Physiology & Biophysics; Regulation of Salt and Water Reabsorption by the Distal Nephron

David Schneider, Ph.D., Assistant Professor; Biochemistry & Molecular Genetics; Control of RNA polymerase I transcription in the model eukaryote Saccharomyces cerevisiae

Harry Schroeder, M.D., Ph.D., Professor; Medicine; The Development and Function of Lymphocyte Antigen Receptors. & Genetics of Primary Immune Deficiency Diseases

Lisa Schwiebert, Ph.D., Associate Professor; Physiology & Biophysics; Airway inflammation; lung function; asthma and exercise

Rosa Serra, Ph.D., Professor; Cell Biology; Mechanism of TGF-ß Action in Developmental and Disease Processes

Bingdong Sha, Ph.D., Professor; Cell Biology; Structural and functional studies of proteins involved in protein folding and translocations

John Shacka, Ph.D., Assistant Professor; Pathology; Regulation of Neuron Death by the Autophagy Lysosome Pathway

Anath Shalev, M.D., Professor;

Sadeep Shrestha, Ph.D., Assistant Professor; Epidemiology; Infectious Disease Epidemiology, Genetic Epidemiology

Peter Smith, Ph.D., Associate Professor; Physiology and Biophysics; The role of the membrane cytoskeleton in regulating the cell surface expression of epithelial transport proteins

Harald Sontheimer, Ph.D., Professor; Neurobiology; The Role of Neuroglia in Brain Function and Disease

Giuseppe L. Squadrito, Research Associate Professor; Environmental Health Sciences; Development, design and evaluation of dynamic multi-component molecular systems that can be used to understand

David G. Standaert, M.D., Ph.D., Endowed Professor; Medicine/Neurology; the effects of oxidants in biological systems of various degrees of complexity

David Sweatt, Ph.D., Professor; Neurobiology; Signal Transduction Mechanisms in Learning and Memory

Elizabeth Sztul, Ph.D., Professor; Cell Biology; Membrane Traffic; Protein Degradation

Anne Theibert, Ph.D., Associate Professor; Neurobiology; Role of phosphoinositides in developmental neurobiology

Sunnie Thompson, Ph.D., Assistant Professor; Microbiology; Translation initiation during viral infection, tumorigenesis, or under stress.

Jaideep Thottassery, Ph.D., Pathology; Cks1, Skp2, cell cycle, breast cancer, antiestrogen resistance, nucleosides, DNA methylation

Janusz Tucholski, Ph.D., Assistant Professor; Psychiatry & Behavioral Neurobiology; Cellular and molecular biology of neuroblastoma. Response of neuronal cells and neurons to stress

Thomas Van Groen, Ph.D., Associate Professor; Cell Biology; Amyloid angiopathy in cognitive dysfunction and Alzheimer's disease

Jacques Wadiche, Ph.D., Assistant Professor; Neurobiology; Synaptic transmission and glutamate transporters

Linda Wadiche, Ph.D., Assistant Professor; Neurobiology; The function of adult generated neurons

Mei Wan, Ph.D., M.D., Associate Professor; Pathology; Protein degradation mechanisms of tumor suppressor Smad4/DPC4 in cancers

Qin Wang, M.D., Ph.D., Assistant Professor; Physiology & Biophysics; Regulation of GPCR cellular responses and in vivo functions

Hengbin Wang, Ph.D., Assistant Professor; Biochemistry and Molecular Genetics; Role of Histone Modification in Chromatin Function

Jianbo Wang, Ph.D., Assistant Professor; Cell Biology; Currently, we are focused on a novel signaling pathway termed planar cell polarity (PCP) pathway and how this pathway regulates morphogenesis in mammals.

Andrew B. West, Ph.D., Assistant Professor; Neurology; Genetic and biochemical mechanisms in neurological disorders

C. Roger White, Ph.D., Associate Professor; Medicine/Cardiovascular Disease; Oxidant Stress and Endothelial Dysfunction

Scott Wilson, Ph.D., Assistant Professor; Neurobiology; Mouse Models of Neurodegeneration

Jianming Wu, D.V.M., Ph.D., Assistant Professor; Medicine; Molecular Immunology and Genetics of Human Autoimmune Diseases

J. Michael Wyss, Ph.D., Professor; Cell Biology; Neuroplasticity in aging and neuro cardiovascular control

Eddy Yang, M.D., Assistant Professor, Radiation Oncology; the targeting of DNA repair pathways to enhance the therapeutic ratio

Qinglin Yang, M.D., Ph.D., Associate Professor; Nutrition Sciences; exploring molecular mechanisms underlying the development and progression of heart failure

Yang Yang, M.D., Ph.D., Assistant Professor; Molecular & Cellular Pathology; Targeting heparan sulfate for myeloma therapy

Bradley Yoder, Ph.D., Professor; Cell Biology; Cilia Signaling and Dysfunction in Development and Disease

Nabiha Yusuf, Ph.D., Instructor; Dermatology; environmental influences such as chemical carcinogens and ultraviolet light on the skin and on the immune system

Majd Zayzafoon, M.D., Ph.D., Assistant Professor; Pathology; The Role of Calcium Signaling in the genetic and epigenetic pathogenesis of disease

Jianhua Zhang, Ph.D., Assistant Professor; Pathology; cell and molecular mechanisms, and mouse models of autophagy in development, neurological and psychiatric diseases

Theme Information

Objectives

The Cell, Molecular, and Developmental Biology (CMDB) graduate theme is part of an umbrella graduate program in Biomedical Sciences that focuses on basic process in cell, molecular and developmental biology and how defects in these processes result in human diseases and birth defects. CMDB students will receive comprehensive training and instruction in cell, molecular, and developmental biology using modern tools and approaches as well as a wide range of model organisms and cell culture systems. The overall goal of the theme is to develop well-rounded scholars with expertise applicable to multiple fields pertinent to a productive research and teaching career in academic science centers, research institutions, and industry.

Admission Requirements

Students are admitted into UAB Graduate Biomedical Sciences (GBS) umbrella program and indicate a theme preference. Applicants to the UAB Graduate School are reviewed by the GBS Admissions Committee and will be evaluated on the basis of their undergraduate performance (both the curriculum and grade point average), letters of recommendation, GRE scores, a personal statement of research interests, performance in other graduate programs or research activities and, if possible, a personal interview. Although students select a theme on admission into the GBS program, they may change theme affiliation at anytime; however changes that occur late in the doctoral program may require additional fundamental course work related to the specific theme.

Acceptance into CMDB requires a bachelor's degree including undergraduate coursework in calculus, general and organic chemistry, and at least one introductory course in zoology or biology by the time of entrance. The CMBD theme invites applications from individuals committed to obtaining a graduate education in biomedical sciences. Once accepted into GBS, students must complete the GBS core curriculum and three scientific research rotations in GBS laboratories. CMDB students will then begin course work in areas related to his/her research interests and training needs determined through the advice of faculty mentors and staff.

Overview of the CMDB Theme

The CMDB theme is comprised of over 60 primary and secondary faculty members with appointments in many of the academic departments and Centers at UAB including Cell Biology, Genetics, Biochemistry, Neurobiology, Medicine, Oral and Maxillofacial Surgery, Nutrition Sciences, Cardiovascular Disease, Clinical Immunology, Rheumatology, Pathology, Environmental Health Sciences, Physiology and Biophysics, Psychiatry & Behavioral Neurobiology, Vision Sciences and Optometry. The scientific interests of the faculty are very diverse and interdisciplinary in nature. As such, the CMDB theme can provide students an individually tailored, comprehensive training program in cell, molecular, and

developmental biology using modern tools and approaches in a wide range of model organisms. The research conducted by CMDB faculty addresses fundamental cellular and molecular questions that provide the basis for understanding and treating human disease.

In the first semester, all students accepted into the GBS program will complete a 14-week core course covering fundamentals in biochemistry, metabolism, genetics, molecular and cellular biology. After completion of the core GBS curriculum, CMDB students will complete a course entitled Cell Signaling.

In addition, starting early in the first semester each student will obtain research experience through three laboratory rotations that will be completed by the end of the first year. Laboratory rotations are for ten weeks and are an integral part of the first year curriculum. They are the first opportunity to truly experience what graduate level scientific research is all about. These rotations are highly structured and are meant for you to become acquainted with the laboratory and the mentor and to gain practical experience in a variety of the techniques and types of scientific questions being addressed within the different theme areas. At the end of each rotation the students will present their research in the form of a poster presentation that is open to the GBS community. After completion of the rotations, students choose a mentor and laboratory for their dissertation research.

In the second semester, CMDB students must attend Methods and Scientific Logic, a journal club designed to demonstrate how to critically evaluate data and experimental design in the scientific literature and research. In addition, beginning in the second semester CMDB students will complete a series of one month modules in areas related to cell, molecular and developmental biology that are in the general research and scientific interest of the individual student. The CMDB curriculum is tailored to the student's research and scientific interests. As such, the student will be able to select from modules in the CMDB theme as well as from other GBS themes approved by the student's mentor and the CMDB theme directors. The student must complete eight modules, five of which should be listed as a CMDB course. Additional course work may be required to fill gaps in the student's knowledge based on the recommendation of the mentor and the student's thesis committee.

In the summer of the first year, all CMDB students must complete course in Biostatistics and Bioethics as well as conduct non-dissertation research in their selected laboratories.
At the beginning of the second year, students will assemble a thesis committee in consultation with their mentors. This committee will be formed by anywhere between 4 and 6 members, 3 of which should be faculty associated with the CMDB theme.

In the second year, students continue non-dissertation laboratory research and take module course work to fulfill the requirements described above. By the beginning of the third year, CMDB students must

complete their qualifying examination consisting of a written dissertation research proposal in the format of an NIH style grant and an oral defense. The examination will evaluate whether the student has gained a sufficiently broad knowledge necessary for successful academic research. To help in this process, the second year curriculum will include a course in scientific writing and grantsmanship with a mock NIH grant review session. After successful completion of the exam the proposal will be submitted to a funding agency (if applicable) for possible support.

After the second semester, all students must participate in a CMDB approved Departmental Seminar Series and a weekly journal club until completion of the doctoral degree.

The curriculum of each Ph.D. candidate usually requires five years of training and is individually tailored to the interests and needs of the student by the advisor and a graduate committee chosen by the student. The Ph.D. degree is awarded upon successful defense of your dissertation, which includes an oral presentation of original, creative scientific investigations, and a written dissertation which is expected to include published manuscripts or manuscripts in preparation. Because pursuit of the Ph.D. degree is a full-time activity, all graduate students are supported by monetary stipends and do not have any required teaching duties. The level of activity required does not permit outside jobs or excessive extracurricular activities. Continuous registration and satisfactory academic standing during all terms is required.

Additional Information

Deadline for Entry Term(s):	Fall Semester
Deadline for All Application Materials to be in the Graduate School Office:	Domestic: April 30 (early submission is strongly encouraged for priority processing, as select applicants will interview in January and February) International: January 15
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE

For detailed information see Web www.uab.edu/cmdb or contact:

Dr. Bradley K. Yoder
Professor
McCallum Building, Room 688
1918 University Blvd.
Birmingham, AL 35294-0005

byoder@uab.edu

Nan Travis
Program Manager
Shelby Building, Room 120B
1825 University Boulevard
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Course Descriptions - Cell, Molecular and Developmental Biology

Cell Signaling - This course covers major extracellular and intracellular signal transduction cascades that regulate animal development and physiology. The class meets every day for 2 hours and consists of two exams.

Cellular Membranes and Organelles - This class will cover molecular and cellular processes that are involved in the assembly and maintenance of membranes and organelles and how defects in these processes contribute to human disease.

Cell and Molecular Aspects of Developmental Biology - The goal of this course is to provide an introduction to the fundamentals of vertebrate developmental biology. The course will consist of faculty lectures and research paper discussion groups covering a broad range of developmental issues from fertilization to organogenesis.

Developmental Neuroscience- The course will utilize the scientific literature and faculty lectures to cover a broad range of topics related to the mechanisms of building a brain. The topics covered range from neural induction in early development, to axonal guidance and synapse formation, to neuro-gial interactions in the adult nervous system. Grades will be based on two exams and student participation in class discussions.

Stem Cell Biology - This course will explore the derivation, manipulation, and differentiation of embryonic, fetal, and adult stem cells in both mice and humans. Topics to be discussed include stem cell self-renewal, teratoma formation, hematopoietic stem cells, neural stem cells, trans-differentiation, nuclear transfer, and reproductive and therapeutic cloning. The course will be a mixture of instructor lectures and interactive journal club style presentations from the current stem cell literature by the students. Students will be evaluated based upon their journal article presentations, participation in class

discussions, quizzes, and attendance.

Development and Evolution – This course will cover the developmental mechanisms that drive evolutionary change and how body plans evolve through natural selection. The course consists of lectures and scientific literature discussions that will demonstrate developmental biology principles.

Skeletal Development and Disease - The primary goal of this course is to introduce graduate students to the basic and translational knowledge about development, maintenance and homeostasis of the mineralized tissues. Lectures in this course will focus on approaches and techniques that are utilized for understanding cellular and molecular mechanisms essential for the normal development, remodeling and patho-physiology of skeleton.

Cell and Matrix Interactions in Disease & Development - This course will cover a combination of basic mechanisms underlying extracellular matrix interactions with cells, and how these go wrong in several disease processes. It will be a series of seminars, followed in the final week with oral student presentations on the disease of their choice and submission of a one-page summary.

Mechanisms of Birth Defects - This class will provide an overview of the mechanisms of common birth defects. A review of the development of each organ system is followed by a discussion of molecular mechanisms leading to alterations in normal development. Genetic and environmental mechanisms are discussed. A recent paper on each topic is presented as part of the class. Depending on the number of students enrolled, each student will be required to present one or two papers**.**

Grantsmanship and Scientific Writing – The objective of the course is to teach students how to effectively write grant proposals. This course will provide hands on training in the preparation of a grant application and demonstrate effective strategies for assembling a successful proposal. With guidance from the faculty, the students will write a NIH style proposal on their dissertation research topic. After the proposal is complete, each grant will be reviewed in a mock NIH study section. Based on the comments from the study section, the student will revise the application and submit the proposal to his/her thesis committee as part of the qualifying examination for admittance into candidacy.

Laboratory Rotations. Concurrent with the first year of course work, each student will perform laboratory research with mentors of his/her choosing in any of the GBS themes. Laboratory rotations are meant help students become acquainted with the laboratory and the mentor and to gain practical experience in a variety of the techniques and types of scientific questions being addressed within the different theme areas. Laboratory rotations last approximately ten weeks and each student will complete three rotations by the end of their first year. At the end of each rotation the students will present their research in the

form of a poster. The performance in the laboratory and the poster presentation will be graded by the mentor of the laboratory and by two GBS faculty members respectively. A passing grade is required for all laboratory rotations. 1-6 hours.

Non-Dissertation Research. Laboratory research performed prior to admission to candidacy. 1-12 hours.

Dissertation Research. Prerequisite: Admission to candidacy. 1-12 hours.

CMDB Approved Seminar Series – All CMDB students must attend one of the weekly departmental based seminar series within the scientific interest of the student. The seminar series feature prominent speakers from both inside and outside of UAB and attendance is mandatory. Current approved seminar series include: Cell Biology, Neuroscience, Genetics, and Biochemistry. Additional seminar series may be included upon approval of CMDB and the mentor.

CMDB Journal Clubs - In the beginning of the second year until completion of the thesis defense, all CMDB students must participate in a journal club related to the student's research interests and to the CMDB theme. The purpose of the journal club is to give students valuable experience in critical assessment of the scientific literature and to keep up-to-date on the research activities emerging from CMDB related research. Current journal clubs associated with the CMDB theme are: Autophagy and Cell Death, Cell Biology, Cell-Matrix Interactions, Cancer and Developmental Biology, and Stem Cell Biology. Additional journal clubs may be included upon approval of CMDB and the mentor.

Genetics and Genomic Sciences (Ph.D.)

Director: Daniel C. Bullard, Ph.D.

Phone: (205) 934-7768

E-mail: dcbullard@uab.edu

Web site: www.uab.edu/ggs

Faculty

Aissani, Brahim, Ph.D., Research Assistant Professor; **C**ancer control and population science

Allison, David, Ph.D., Professor; Obesity, quantitative genetics, clinical trials, and statistical and

research methodology

Arnett, Donna, Ph.D., M.S.P.H., Professor; Genetic Epidemiology, Pharmacogenetics

Beasley, Mark, Ph.D., Associate Professor; Methodological problems in statistical genetics and bioinformatics

Bebok, Zsuzsanna, M.D., Associate Professor; Protein folding disorders; Cystic fibrosis; Gene expression regulation by cellular stress responses

Bedwell, David, Ph.D., Professor; Translation termination, mRNA turnover

Bevensee, Mark, Ph.D., Associate Professor; Cellular and Molecular Physiology of Acid-base Transporters and pH Regulation

Blume, Scott, M.D., Associate Professor; Specific regulation of gene expression at the translational level - through sequence-specific RNA-binding proteins and complex 5'-untranslated RNA sequences; dysregulation of gene-specific translational control mechanisms in cancer.

Bray, Molly, Ph.D., Professor; Molecular and genetic basis of obesity; genetic analysis of complex traits; gene-environment interaction; physical activity/exercise physiology; adipogenesis; genetics of response to obesity interventions

Bridges, S. Louis, M.D., Professor; Genetic Influences on Treatment Responses in Rheumatoid Arthritis, particularly in African-Americans, and pharmacogenetics of rheumatoid arthritis

Briles, David, Ph.D., Professor; Bacterial pathogenesis; virulence; immunity; pneumococcus

Brown, Elizabeth, Ph.D., Associate Professor; Immunogenetics of autoimmune disease, infectious disease and virally-associated cancers

Bullard, Daniel C., Ph.D., Associate Professor; Regulation of Inflammatory Responses, Pathogenesis of Lupus and Vasculitic Disorders

Burrows, Peter, Ph.D., Professor; Lymphocyte Development and Function

Carroll, Steven, M.D., Ph.D., Professor; The Role of Neuregulin-1 in Peripheral Nervous System Neoplasia

Chesnokov, Igor, Ph.D., Assistant Professor; DNA Replication and Cell Cycle in Eukaryotes

Crasto, Chiquito, Ph.D., Assistant Professor; Bioinformatics, Olfactory receptors, Protein modeling, Neurological disorders

Cui, Xiangqin, Ph.D., Research Assistant Professor; Splicing array design ; Equivalence tests for large dimension data produced by microarrays

Detloff, Peter, Ph.D., Associate Professor; Mouse Models of Human Genetic Disorders

Dybvig, Kevin, Ph.D., Professor; Pathogenic mechanisms of mycoplasmas

Edberg, Jeffery, Ph.D., Professor; Genetic Polymorphisms in Wegener's Granulomatosis

Eltoum, Isam, M.D., M.B.A.; Professor; Clinical research in diagnostic cytology and surbical pathology; tumorogenesis of prostate cancer and chemoprevention; HPV infection

Fernandez, Jose, Ph.D., Associate Professor; Identification of genes contributing to racial differences in obesity, diabetes, and cancer: the genetic admixture approach

Frank, Stuart, M.D., Professor; Med – Endocrinology, Diabetes and Metabolism; Growth hormone action and GH receptor structure and function

Gross, Alecia, Ph.D., Associate Professor; Rhodopsin-mediated retinal degeneration, mechanisms of photoreceptor membrane biogenesis

Guay-Woodford, Lisa, M.D., Professor; Genetics of renal disease, particularly polycystic kidney disease

Hartman, John, M.D., Assistant Professor; Quantitative analysis of genotype-phenotype interaction networks in yeast models of human disease

Higgins, Patrick, Ph.D., Professor; Genetic and Biochemical Studies of Chromosome Dynamics

Hollingshead, Susan, Ph.D., Professor; Mechanisms of Variation in Microbial Pathogenesis

Javed, Amjad, Ph.D., Associate Professor; Genetic and Molecular Signaling for Cellular Differentiation and Skeletogenesis

Jiao, Kai, M.D., Ph.D., Associate Professor; TGF-beta/Bmp signaling during cardiogenesis

Kaslow, Richard, M.D., Professor; Epidemiology of Infection and Immunity

Kesterson, Robert A., Ph.D., Associate Professor; Hypothalamic Control of Feeding Behavior

Kimberly, Robert, M.D., Professor; Autoimmunity, Molecular Mechanisms and Genetic Risk

Klug, Christopher, Ph.D., Professor; Hematopoietic stem cell development

Korf, Bruce, M.D., Ph.D., Professor; Neurofibromatosis Type 1

Lefkowitz, Elliot J., Ph.D., Associate Professor; Viral and Microbial Genomics, Evolution, and Bioinformatics

Lesort, Matheiu, Ph.D., Associate Professor; Pathogenesis of Huntington's disease

Limdi, Nita, Ph.D., Associate Professor; Genetic and environmental regulation of warfarin and other drug responses

Liu, Nianjun, Ph.D., Associate Professor; genetic linkage and association analysis, disequilibrium mapping, population genetics, bioinformatics, machine learning methods and longitudinal data analysis and their applications in genetics and bioinformatics

Lothrop, Clint, Ph.D., Professor; Allograft rejection, novel therapies for blood disorders

Messiaen, Ludwine, Ph.D., Professor; Molecular genetics testing in hereditary disorders; molecular dissection of the variant forms of NF1

Messina, Joseph, Ph.D., Professor; Insulin and Growth Hormone (GH) Action, Insulin and GH Resistance Following Trauma and Infection

Miller, Michael, Ph.D., Associate Professor; Function and evolution of intercellular communication mechanisms

Norton, Thomas T., Ph.D., Professor; Juvenile eye development, mechanisms leading to myopia or hyperopia

Olsen, Michelle, Assistant Professor, Physiology & Biophysics; Glial potassium channels and glutamate transporters in injury and abnormal development

Pasche, Boris, M.D., Ph.D., Professor; TGF-beta in cancer development and progression, biological

effects of amplitude-modulated electromagnetic fields, role of variants of the adiponectin pathway in cancer development.

Peng, Ji-Bin, Ph.D., Associate Professor; Calcium transport proteins and their roles in health and disease

Pittler, Steven, Ph.D., Professor; Characterization of Photoreceptor Metabolism and Retinal Degeneration

Popov, Kirill, Ph.D., Professor; Regulation of pyruvate dehydrogenase complex

Pozzo-Miller, Lucas, Ph.D., Professor; Regulation of synaptic transmission and plasticity

Roth, Kevin, M.D., Ph.D., Professor; Molecular Regulation of Neuronal Cell Death

Ryan, Tom, Ph.D., Associate Professor; Stem cell therapies in animal models of human disease

Schneider, David, Ph.D., Assistant Professor; Control of RNA polymerase I transcription in the model eukaryote Saccharomyces cerevisiae

Schroeder, Harry, M.D., Ph.D., Professor; The Development and Function of Lymphocyte Antigen Receptors. &Genetics of Primary Immune Deficiency Diseases

Serra, Rosa, Ph.D., Professor; Mechanism of TGF-ß Action in Developmental and Disease Processes

Anath Shalev; M.D.; Professor; Med – Encocrinology, Diabetes & Metabolism

Shrestha, Sadeep, Ph.D., Assistant Professor; Interplay of human genetics with behavioral and environmental factors in the natural history and pathogenesis of infectious diseases (HIV, HBV, HCV, HPV, HTLV) and chronic disorders such as Kawasaki disease and coronary heart disease

Sorscher, Eric, M.D., Professor; Cystic Fibrosis and Molecular Genetics; Patient Oriented Research

Standaert, David, M.D., Ph.D., Professor; Translational Research in Neurodegenerative Diseases

Steyn, Adrie, Ph.D., Associate Professor; Mechanism of Mycobacterium tuberculosis virulence

Strong, Theresa, Ph.D., Associate Professor; Identification of Tumor Antigens and Development of Cancer Vaccines

Sweatt, David, Ph.D., Endowed Professor; Signal Transduction Mechanisms in Learning and Memory

Szalai, Alex, Ph.D., Professor; Inflammation, innate immunity, and the acute phase proteins in health and disease

Tang, Jianming, Ph.D., Associate Professor; Genetic and Epigenetic Correlates of Invection and Immunity

Theibert, Anne, Ph.D., Associate Professor; Role of phosphoinositides in developmental neurobiology

Thompson, Sunnie, Ph.D., Assistant Professor; Translation initiation and replication of RNA viruses

Tiwari, Hemant, Ph.D., Associate Professor; Genetic Linkage Analysis, Disequilibrium Mapping, Population Genetics, Molecular Evolution, Bioinformatics, and Genetics of Infectious Diseases

Unlap, M. Tino, Ph.D., Associate Professor; Role of the Na+/Ca2+ exchanger in mediating the effects of oxidative stress in hypertension, cancer and alzheimer's disease

Wang, Jianbo, Ph.D., Assistant Professor; Metabolic diseases

West, Andrew, Ph.D., Assistant Professor; Genetic and biochemical mechanisms in neurological disorders

Wilson, Scott, Ph.D., Associate Professor; Mouse Models of Neurodegeneration

Wyss, J. Michael, Ph.D., Professor; Genetic and biochemical mechanisms in neurological disorders

Yacoubian, Talene, M.D., Ph.D., Neurology; Role of 14-3-3 proteins in Parkinson’s disease

Yi, Nengjun, Ph.D., Associate Professor; Development of statistical and computational methods for identifying multiple interacting genes for complex traits

Yoder, Brad, Ph.D., Professor; Cilia Signaling and Dysfunction in Development and Disease

Yother, Janet, Ph.D., Professor; Capsular polysaccharides of Streptococcus pneumoniae

Zhang, Jianhua, Ph.D., Assistant Professor; Cell and molecular mechanisms, and mouse models of autophagy in development, neurological and psychiatric diseases

Zhang, Kui, Ph.D., Associate Professor; Development of methodologies for linkage, disequilibrium,

haplotype, and microarray analysis.

Theme Information

Objectives

The main goal of the **Genetics and Genomic Sciences Graduate Program (GGS)** is to provide students with an outstanding, flexible, didactic training experience to prepare them for independent and innovative careers in research. The Program emphasizes a broad approach to the fundamental principles of genetics and genomics, and offers a large pool of mentors with expertise in a wide variety of areas. The GGS offers close day-to-day interactions between students and faculty, both in the classroom and the laboratory.

The research interests of our program faculty span the fields of genetics, genomics, cancer, biochemistry, cell biology, and developmental biology. Modern molecular approaches are used to study gene structure, expression, and function in diverse experimental systems including humans, mice, *Drosophila*, *C. elegans*, and other organisms such as bacteria. The GGS is also designed to permit close collaborations during the Ph.D. training period between graduate students, postdoctoral fellows, and faculty, while also encouraging full participation in the larger community of biological scientists at UAB.

Admission Requirements

Students are admitted into UAB Graduate Biomedical Sciences (GBS) umbrella program and indicate a theme preference. Applicants to the UAB Graduate School are reviewed by the GBS Admissions Committee and will be evaluated on the basis of their undergraduate performance (both the curriculum and grade point average), letters of recommendation, GRE scores, a personal statement of research interests, performance in other graduate programs or research activities and, if possible, a personal interview. Although students select a theme on admission into the GBS program, they may change theme affiliation at anytime; however changes that occur late in the doctoral program may require additional fundamental course work related to the specific theme. Acceptance into GGS requires a bachelor's degree including undergraduate coursework in calculus, general chemistry, organic chemistry, and at least one introductory course in zoology or biology by the time of entrance. Doctoral students will receive financial aid in the form of a stipend/fellowship plus full payment of tuition, fees, and their insurance premium. Current stipend/fellowships are $26,000 per year for 20011-2012 entering students.

The GGS theme invites applications from individuals committed to obtaining a graduate education in fields related to genetics or genomics. We recommend that applicants take prior courses covering basic concepts in genetics and biochemistry if possible; however, this is not required for admission. Applications are strongly encouraged from individuals with previous research experience, a master's

degree in related area, or a professional degree such as the M.D. or D.V.M. Once accepted into GBS, students must complete the GBS core curriculum and three scientific research rotations in GBS laboratories. GGS students will then begin course work in areas related to his/her research interests and training needs determined through the advice of faculty mentors and staff.

Overview of the GGS Program

The GGS theme is comprised of over 80 primary and secondary faculty members with appointments in many of the academic departments and Centers at UAB including Genetics, Cell Biology, Microbiology, Biochemistry, Neurobiology, Medicine, Pathology, Epidemiology, Biostatistics, Nutrition Sciences, Vision Sciences, and others. The scientific interests of the faculty are very diverse and interdisciplinary in nature. As such, the GGS theme can provide students an individually tailored, comprehensive training program in genetics and genomics through use of modern tools and approaches in a wide range of model organisms. The research conducted by GGS faculty addresses fundamental cellular and molecular questions that provide the basis for understanding and treating human disease.

In the first semester, all students accepted into the GBS program will complete a 14-week core course covering fundamentals in biochemistry, metabolism, genetics, molecular and cellular biology. After completion of the core GBS curriculum, GGS students will then take the *Principles of Genetics course that will cover Mendelian and nonmendelian inheritance mechanisms, cytogenetics and chromosome disorders, and basic epigenetic concepts.* Students are also expected to attend a weekly journal club and seminar series, such as those offered by the Department of Genetics, during all years of their graduate training. These weekly events generally start in September and run through May of each academic year.

In addition, starting early in the first semester each student will obtain research experience through three laboratory rotations that will be completed by the end of the first year. Laboratory rotations are for ten weeks and are an integral part of the first year curriculum. They are highly structured and allow the student to become acquainted with the laboratory and the mentor, gain practical experience in a variety of the techniques, and to learn about the different scientific questions being investigated within the GGS theme. At the end of each rotation, the students will present their research in the form of a poster presentation that is open to the GBS community. After completion of all three rotations, students choose a mentor and laboratory for their dissertation research.

In the second semester, GGS students will complete a series of one month modules that cover a wide variety of subjects including genome structure and function, linkage and association analyses, bioinformatics, and model systems for genetic analyses. In the summer of the first year, all GGS students must complete course in Biostatistics and Bioethics and conduct non-dissertation research in their

selected laboratories.

During the subsequent years of the program, GGS students will focus on their laboratory research, as well as take a small number of specialized courses related to genetics and genomic sciences, or their specific areas of investigation. At the end of the second year of graduate training, students will assemble a thesis committee in consultation with their mentors. This committee will contain 4-6 faculty members, 3 of which should be faculty associated with the GGS theme. By the midpoint of the third year, GGS students must complete their qualifying examination consisting of a written dissertation research proposal in the format of an NIH style grant and an oral defense. The examination will evaluate whether the student has gained a sufficiently broad knowledge necessary for successful academic research. To help in this process, the third year fall curriculum will include a course in scientific writing and grantsmanship with a mock NIH grant review session. After successful completion of the exam the proposal will be submitted to a funding agency (if applicable) for possible support. After passing the qualifying exam and the necessary advanced coursework, GGS students are accepted to candidacy for the Ph.D. degree.

The curriculum of each Ph.D. candidate usually requires five years of training and is individually tailored to the interests and needs of the student by the advisor and a graduate committee chosen by the student. The Ph.D. degree is awarded upon successful defense of your dissertation, which includes an oral presentation of original, creative scientific investigations, and a written dissertation which is expected to include published manuscripts or manuscripts in preparation. The pursuit of the Ph.D. degree is a full-time activity, therefore all graduate students are supported by monetary stipends and do not have any required teaching duties. The level of activity required does not permit outside jobs or excessive extracurricular activities. Continuous registration and satisfactory academic standing during all terms is required.

Additional Information

Deadline for Entry Term(s):	Fall Semester
Deadline for All Application Materials to be in the Graduate School Office:	Domestic Applications: April 30 (early submission is strongly encouraged for priority processing) International Applications: Jan 15
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE or MCAT

For detailed information, contact:

Nan Travis

GGS Graduate Program Manager
UAB, Graduate Biomedical Sciences Office
Shelby Building, Room 120B
1825 University Boulevard
Birmingham, AL 35294-2182
Telephone: (205) 934-1033
Fax: (205) 996-6749
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Or

Daniel C. Bullard, Ph.D.
GGS Program Director
Department of Genetics
KAUL 602B
University of Alabama at Birmingham (UAB)
720 South 20th Street, Birmingham, Alabama 35294-0024
Telephone: (205) 934-7768
Fax: (205) 975-4416
E-mail: **dcbullard@uab.edu**

Course Descriptions for Genetics and Genomic Sciences

Required Courses

GBS 720: Genome Structure & Function. This course will cover a wide variety of topics related to this topic, including genetic variation and polymorphisms, alternative splicing, microRNAs, and novel sequencing and microarray technologies.

GBS 721: Genetic Epidemiology. Lectures for this course will focus on basic and advanced concepts in population genetics, linkage, genome-wide association analyses, admixture, genotype/phenotype correlation, and other related topics.

GBS 722: GGS Bioinformatics. This course will cover a wide variety of different bioinformatics applications, which will be taught through use of available on-line bioinformatics resources. The topics covered will include: introductions to large-scale, generic databases at NCBI, European Bioinformatics Institute, SwissProt, PDB, UniProt and Ensembl; Sequence analysis systems such as BLAST, ORF-Finder and GENSCAN, Multiple Sequence Analysis, gene identification in DNA and an introduction to the

Human Genome Project; resources that are used in Microarray Data Analysis; Protein sequence analysis using Pfam, Prosite, Prints, Blocks, Protein structure analysis using SCOP, CATH; structural bioinformatics, secondary structure calculation, homology modeling, structure prediction, protein folding, protein-ligand docking and molecular dynamics.

GBS 723: Model Systems for Genetic and Epigenetic Analysis. The course will provide students with an in-depth knowledge of the different animal models used for analyses of gene function and genetic pathways. Topics include transgenic and knockout mouse technologies and strategies, large scale genetic screens in *C. elegans* and *Drosophila*, and modeling human genetic diseases in zebrafish.

MGE 707: Grant Proposal Writing. The objective of the course is to teach students how to effectively write grant proposals. This course will provide hands on training in the preparation of a grant application and demonstrate effective strategies for assembling a successful proposal. With guidance from the faculty, the students will write a NIH style proposal on their dissertation research topic. After the proposal is complete, each grant will be reviewed in a mock NIH study section. Based on the comments from the study section, the student will revise the application and submit the proposal to his/her thesis committee as part of the qualifying examination for admittance into candidacy.

Elective Courses (Can be taken for advanced course credit)

MGE 725: Advanced Medical Genetics. This course will focus on the medical application of advances in genetics and genomics. Topics include chromosome structure and function and major types of chromosomal abnormalities, cancer genetics and cytogenetics, inborn errors of metabolism, current strategies for detection of mutations associated with genetic disorders, genetic risk assessment and population genetics, and genomic approaches to diagnosis and risk stratification.

Systems Biology. Lectures will consider systems biology approaches in the context of the human genome project, and with an emphasis on simple model systems. Technologies, biological concepts, and the underlying motivation for this emerging area will be discussed using examples available in the literature. The central focus of systems biology is to acquire a more global and quantitative understanding of how living organisms function as complex genetic systems, and how this might provide a more complete understanding of phenotypic traits.

Other GGS Educational Activities

Department of Genetics Seminar. The Department of Genetics Seminar series meets once a week from September through May of each academic year. This is a forum in which invited speakers from other institutions, as well as UAB faculty members, postdoctoral fellows, and advanced graduate students

present and discuss their research.

Medical Genetics Journal Club. Faculty, students, and postdoctoral fellows meet once a week and present papers on a wide variety of topics related to genetics and genomics.

Immunology (Ph.D.)

Director: Dr. Peter Burrows

Phone: (205) 934-6529

E-mail: peterb@uab.edu

Web site:

Faculty

William W. Andrews, Professor

T. Prescott Atkinson, Professor; immunodeficiencies, allergy, inflammation

Scott R. Barnum, Professor; Neuroimmunology, complement, EAE, cerebral malaria

Khurram Bashir, Professor; neuroimmunology, MS

Etty Benveniste, Professor; cytokines, neuroimmunology

J. Edwin Blalock, Professor; pulmonary immunology

Suresh Boppana, Professor;

S. Louis Bridges, Jr., Professor; Genetics of rheumatoid arthritis

David E. Briles, Professor; host-pathogen interactions, *S. pneumoniae*

Elizabeth E. Brown, Assistant Professor; epidemiology of immune disease

Donald Buchsbaum, Professor; Cancer immunotherapy

R. Pat Bucy, Professor; T cell immunology

Daniel C. Bullard, Associate Professor; adhesion molecules, autoimmune disease

Peter D. Burrows, Professor; B cell development and function

David D. Chaplin, Professor; Lymphoid tissue development

Noel K. Childers, Professor; mucosal immunology, oral pathogens

James Collawn, Professor; sorting and endocytic pathways

Randy Cron, Associate Professor; Immunotherapy

Randall S. Davis, Associate Professor; Fc receptors, lymphocyte development

Patricia De Sarno, Assistant Professor; Experimental autoimmune encephalomyelitis

Jeffrey C. Edberg, Associate Professor; Fc receptors, rheumatoid arthritis

Craig A. Elmets, Professor; dendritic cell biology

Charles O. Elson, III, Professor; Mucosal immunology

David O. Freedman, Professor; immuno-parasitology, tropical medicine

Kohtaro Fujihashi, Professor; Mucosal immunology

James F. George, Professor; Transplantation

Vithal K. Ghanta, Professor; Cancer biology

Paul Goepfert, Associate Professor; Immune responses to HIV

Laurie E. Harrington, Assistant Professor; T cell memory

Zdenek Hel, Assistant Professor; HIV pathogenesis

Hui-Chen Hsu, Associate Professor; Autoimmunity

Louis B. Justement, Professor; Lymphocyte signaling

Janusz Kabarowski, Assistant Professor; bio-active lipids and inflammation

Judith A. Kapp, Professor; ocular immunology, autoimmune disease

Richard A. Kaslow, Professor; epidemiology of HIV infections

John F. Kearney, Professor; B cell development

Robert P. Kimberly, Professor; Fc receptors, rheumatoid arthritis

Christopher A. Klug, Professor; Hematopoietic stem cells

Hiromi Kubagawa, Professor; Immunopathology

Richard D. Lopez, Associate Professor; gamma/delta T cells

Robinna G. Lorenz, Professor; Mucosal immunology

Sadis Matalon, Professor; reactive oxygen and nitrogen species

Jiri Mestecky, Professor; Mucosal immunology

Suzanne M. Michalek, Professor; Mucosal immunology

John D. Mountz, Professor; T cells in autoimmunity

Moon Nahm, Professor; Immunity to pneumococci

Jan Novak, Associate Professor; Glycosylation in immune responses

Hongwei Qin, Assistant Professor; Immune signaling

Raghavan Raju, Associate Professor; Acute inflammation

Chander Raman, Associate Professor; T cell immunology

David Randolph, Assistant Professor; T cell immunology

Russell W. Read, Associate Professor; Ocular immunology

Harry W. Schroeder, Jr., Professor; Immunogenetics

Lisa M. Schwiebert, Associate Professor; Asthma

Chad Steele, Associate Professor; Pulmonary immunology

Alexander J. Szalai, Professor; C-reactive protein, F c receptors, innate immuity

Jianming Tang, Associate Professor; genetic contribution to infection and immunity

Laura Timares, Assistant Professor; Dendritic cell biology

Hubert Tse, Assistant Professor; diabetes, reactive oxygen species, autoimmune disease

Mark R. Walter, Professor; structure of cytokines and cytokine receptors

Casey T. Weaver, Professor; T cell immunology

Douglas A. Weigent, Professor; Neuroimmunology

Jianming Wu, Assistant Professor; Autoimmune disease

Hui Xu, Associate Professor; Immunoregulation

Janet Yother, Professor; host-pathogen interactions

Nabiha Yusuf, Instructor; Environmental immunology

Allan J. Zajac, Associate Professor; Immunovirology

Huang-Ge Zhang, Associate Professor; Clinical/Translational

Tong Zhou, Professor; immunotherapy, autoimmune disease

Theme Information

Objectives

The Immunology Graduate Theme is a part of the UAB Graduate Biomedical Sciences Program. We are an interdisciplinary program emphasizing the study of multiple aspects of the immune system, from basic molecular mechanisms to whole animal studies and human translational research. The remarkable breadth of our program can be seen in the primary departments of the almost fifty theme faculty members. Faculty from the Departments of Microbiology, Cell Biology, Biochemistry and Molecular Genetics, Genetics, Biology, Pathology, Physiology and Biophysics, Medicine, Pediatrics, Environmental Health Sciences, Epidemiology, Surgery, Ophthalmology, Dermatology, and Dentistry are involved in internationally recognized research and in the training of PhD-level graduate students and postdoctoral fellows. Currently, forty-five students are in training in the laboratories of our immunology faculty. Primary areas of research include: Allergy, Autoimmunity, Cancer Immunology, Clinical/Translational,

Developmental Immunology, Host Defense, Immunodeficiency, Immunogenetics, Inflammation, Mucosal and Ocular Immunology, Neuroimmunology, Structural Immunology, and Transplantation Immunology. Students obtaining a PhD in the Immunology Graduate Theme will be well-versed in modern immunology and have the option to pursue diverse career pathways.

Admission Requirements

Acceptance is based on undergraduate record (curriculum and grade point average [GPA]), Graduate Record Exam (GRE) scores, letters of recommendation, a personal statement of research and career interests, and past research activities. Domestic candidates who pass the first round of selection will be invited to visit UAB and meet the Immunology faculty and students.

The general requirements for acceptance into the Theme are:

- minimum GPA of 3.0 on a 4.0 scale
- combined verbal/quantitative GRE score ≥1100
- a strong background in biology, chemistry, and/or mathematics. Undergraduate level courses in immunology, cell biology, biochemistry, physics, genetics, organic and analytical chemistry are strongly encouraged. Undergraduate mathematics through calculus is also recommended.
  International students must submit scores from the Test of English as a Foreign Language (**TOEFL)** earned within the last two years. Applicants with scores of 600 (paper-based) or 250 (computer-based) or higher will be considered.

All students in the program receive a stipend (currently $26,000), tuition and fees, and single coverage health insurance. Support is provided by the Theme, by the student's mentor, or through one of many fellowship programs.

Overview of the Theme

The Theme emphasizes interdisciplinary training in all areas of modern immunology. The first year of the program involves fundamental coursework and three research-based rotations in laboratories of the student's choosing. A qualifying examination and admission to candidacy take place in the second to third year. Advanced coursework, journals clubs, and dissertation research occur in the second and subsequent years. It is expected that completion of the PhD will require five to six years.

To broaden their training experience, students are introduced to research at the national and international levels through seminars presented by outside speakers and by attendance at national and international scientific meetings. Students take an active role in inviting and hosting speakers at UAB, and they are strongly encouraged to present their own results at outside meetings.

Additional Information

Deadline for Entry Term(s):	Consult Theme Director for information
Deadline for All Application Materials to be in the Graduate School Office:	Domestic Applications: Mar 15 International Applications: Jan 15
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE

For detailed information, contact Dr. Peter Burrows, Theme Director, UAB Immunology Graduate Theme, SHEL 406, 1825 University Blvd., Birmingham, Alabama 35294-2182.

Telephone (205)934-6529

Fax (205) 996-6749

E-mail peterb@uab.edu

Course Descriptions

Core Curriculum

BLOCK 1 - BIOCHEMISTRY/METABOLISM

- Amino acids and primary protein structure
- Protein secondary and tertiary structure
- Postranslational modifications and allosteric changes
- Glycobiology
- Lipid structure and metabolism
- Thermodynamic principles of biochemical reactions
- Enzyme kinetics
- Enzyme mechanisms and regulation
- Amino acid/nitrogen metabolism
- Glycolysis, gluconeogenesis and citric acid cycle
- Glycogenesis, glycogenolysis and pentose phosphate pathway
- Electron transport/oxidative phosphorylation

BLOCK 2 - GENETICS/MOLECULAR BIOLOGY

- DNA recombination
- Nucleic acids & DNA replication
- Prokaryotic transcription
- Prokaryotic translation
- Prokaryotic gene regulation
- Eukaryotic genome organization
- Eukaryotic DNA replication
- Eukaryotic transcription
- Eukaryotic translation
- Eukaryotic gene regulation I
- Eukaryotic gene regulation II
- Mendelian inheritance
- Genetic variation and polymorphisms

BLOCK 3 - BIOLOGICAL ORGANIZATION

- Integrated systems: From organelles to organs
- Membrane structure/function
- Cytoskeleton
- Secretion
- Endocytosis, lysosomal targeting, protein degradation
- Biochemistry of signal transduction
- Cell cycle
- Cell-cell junctions and polarity
- ECM and ECM-cell interactions
- Cell motility
- Apoptosis
- Discipline of pharmacology
- Pharmacokinetics

Theme Specific Courses

Introductory Immunology. Introductory Immunology is a team-taught survey course that covers basic concepts of innate and adaptive immunity. These integrated series of lectures provide a firm foundation in immunology, especially for those with minimal immunology background, and serve as an important refresher for the developing immunologist. Students actively participate in the course through weekly presentations of selected immunology topics based on the current literature.

Lymphocyte Biology. The objective of this class is to provide first year immunology students with the opportunity to gain a more in-depth understanding of selected aspects of lymphocyte biology. Possible topics include T cell subsets, B cell biology, lymphocyte activation, and transplantation immunology. The course is literature intense and students are required to read and present numerous scientific papers.

Dendritic Cell Biology. Understanding the biology and function of the immune system's professional antigen presenting cells, the dendritic cells, is a fast moving challenge. The course will cover the seminal papers in the field that have laid the groundwork for our current understanding of this group of complex cells. The major component of the class will emphasize student presentations of assigned reviews and journal articles. Presentations will include an overview (provided by the review article) and 2-3 papers per class.

History of Immunology. This course will examine the concepts that have shaped what we now consider pillars in our knowledge of the immune system. The course will cover the major events and discoveries that led to these established concepts and, where possible, the advent of technologies that facilitated these advances. The course will involve student participation in the form of presentations in selected areas as well as lectures by some individuals who were part of this history.

Neuroimmunology. The purpose of this course is threefold; 1) to provide students with a basic overview of immunology and neuroscience in conjunction with a specific focus on how neuroinflammatory processes affect the brain, 2) to teach students basic neuroanatomy of the brain, and 3) to have students understand the clinical implications of neuroinflammatory diseases by attending rounds with clinicians. How the immune system influences the brain is an emerging field in neuroscience research and is currently not being addressed in a graduate or medical course.

Innate Immunity. The study of innate immunity has made a resurgence in recent years and its critical role, not only in host defense against invading pathogens, but in the development of adaptive immune responses is now appreciated. This course will provide an in-depth look at selected aspects of the innate immune response including the cellular and molecular components critical to its development. The course will involve student presentations on selected topics.

Mucosal Immunology. The mucosal immune system is essentially the primary site of interaction between invading pathogens and the immune system. Mucosal immunity has always been a strength of the immunology community at UAB and is rarely covered at most other institutions. This class will provide in-depth analysis of the structural features that distinguish the mucosal immune system from the peripheral immune system. Features of innate and adaptive immunity as they relate to mucosal immune responses will also be covered. The course will involve student presentations on selected topics.

Journal Clubs

MIC 797-00: Cellular and Molecular Immunology Journal Club

MIC 796-00: Neuroimmunology Journal Club

MIC 737-VT: Mucosal Immunology Journal Club

MIC 772-VT: Bacterial Pathogenesis Journal Club

MIC 724-VT: Virology Journal Club

MIC 785-00: Post-Transcriptional Regulatory Mechanisms

MIC 786-00: Retrovirology Journal Club

MIC 789-00: Journal Club in Biological Crystallography

Microbiology (Ph.D.)

Degree Offered:	Ph.D.
Director:	Dr. Janet Yother
Phone:	(205) 934-9531
E-mail:	jyother@uab.edu
Web site:	www.uab.edu/micro

Faculty

G.M. Anantharamaiah, Professor; Medicine; Apolipoproteins, Amphipathic Helices and Atherosclerosis

Prescott Atkinson, Associate Professor; Mycoplasma; Asthma; Signal transduction in lymphocytes

David Bedwell, Professor; Translation termination; treatment of genetic diseases

Jorge Benitez, Associate Professor

Suresh Boppana, Professor; Pediatric viral infectious diseases

David Briles, Professor; Bacterial pathogenesis; virulence; immunity; pneumococcus; tuberculosis

Bill Britt, Professor

David Chaplin, Professor

Louise Chow, Professor; Molecular and Cell Biology of Human Papillomaviruses

Jim Collawn, Professor; Cell surface receptors & epithelial cell biology

Terje Dokland, Associate Professor; Structure and assembly of viruses

Kevin Dybvig, Professor; Mycoplasmas; genetics; phenotypic switching; DNA rearrangements

Elena Frolova, Assistant Professor; Alphavirus-host interaction

Ilya Frolov, Professor; Replication and pathogenesis of positive-strand RNA viruses

Kohtaro Fujihashi, Professor; Mucosal immunity; periodontal disease; inflammatory disease

G. Yancey Gillespie, Professor; Molecular & viral therapy of malignant primary brain tumors

Paul Goepfert, Associate Professor; Virology; vaccines

Laurie Harrington, Assistant Professor; Chronic inflammatory disorders; CD4 T-cell memory

N. Patrick Higgins, Professor; Mobile DNA: Structure, Enzymology and Regulation

Susan Hollingshead, Professor; Mechanisms of variation in microbial pathogenesis

John Kappes, Associate Professor

N. Rama Krishna, Professor; Structural Biology and Biomolecular NMR Spectroscopy

Elliot Lefkowitz, Associate Professor; Viral genomics, Evolution, Bioinformatics, and Biodefense

Ming Luo, Professor; Structure-based approaches to anti-infectious agents

Suzanne Michalek, Professor; Vaccine delivery systems; mucosal

Casey Morrow, Professor; Viral morphogenesis and replication; gene therapy and vaccines

Moon Nahm, Professor; Vaccines; *Streptococcus pneumoniae*; bacterial pathogenesis; immunity

Michael Niederweis, Associate Professor; Role of porins in outer membrane permeability & drug resistance of mycobacteria

Jan Novak, Associate Professor; Immunoglobin glycosylation; IgA nephropathy

Robert Novak, Professor; Malaria, mosquito-borne viruses

Peter Prevelige, Professor; Viral capsid self-assembly

David Pritchard, Professor; Biochemical characterization of virulence factors of gram positive bacteria

Matthew Renfrow, Assistant Professor; High resolution mass spectrometry in biomedical research

Jamil Saad, Assistant Professor; Biochemistry and structural biology of retroviruses

David Schneider, Assistant Professor; Regulation of RNA polymerase I transcription initiation and elongation

George Shaw, Professor; Human retroviruses; molecular virology and pathogenesis

Yuhua Song, Assistant Professor; Modeling of biological systems

Chad Steele, Associate Professor; Lung immunology and fungal host defense

Adrie Steyn, Assistant Professor; Mechanism of Mycobacterium tuberculosis virulence

Sunnie Thompson, Assistant Professor; Translation, Molecular virology

Charles Turnbough, Professor; Gene expression and regulation

Mark Walter, Associate Professor; X-ray crystallography; cytokine structure/function

Richard Whitley, Professor; Herpes simplex virus; varicella zoster virus

Hui Wu, Associate Professor; Genetics and pathogenesis of oral infectious diseases

Janet Yother, Professor; *Streptococcus pneumoniae* genetics and pathogenesis; Capsular polysaccharides

Nabiha Yusuf, Instructor; Environmental influences on immune system

Allan Zajac, Associate Professor; Anti-viral immunity; T-cell responses

Theme Information

Objectives

The Microbiology Graduate Program is a part of the UAB Graduate Biomedical Sciences Program. We are an interdisciplinary program emphasizing the study of bacteria, viruses, fungi, and parasites. Over 40 faculty members from the Departments of Microbiology, Cell Biology, Biochemistry and Molecular Genetics, Genetics, Pathology, Medicine, Pediatrics, and Dentistry are involved in internationally renowned research and the training of Ph.D.-level graduate students. Currently, more than 70 students are in training in the laboratories of our faculty. Primary areas of research interest include the genetics, physiology, and molecular biology of microbes and how microbial pathogens cause disease. Basic cellular processes, host-pathogen interactions, and the design of innovative strategies for the prevention and treatment of infectious diseases are under study in the laboratories of our faculty. Students graduating from the Program are well-versed in modern microbiology and have the experience to pursue a diversity of career opportunities.

Admission Requirements

Acceptance is based on undergraduate record (curriculum and grade point average [GPA]), Graduate Record Exam (GRE) scores, letters of recommendation, a personal statement of research and career interests, and past research activities. Domestic candidates who pass the first round of selection will be invited to visit UAB and meet the Immunology faculty and students.

The general requirements for acceptance into the Theme are:

- minimum GPA of 3.0 on a 4.0 scale
- combined verbal/quantitative GRE score ≥1100
- a strong background in biology, chemistry, and/or mathematics. Undergraduate level courses in immunology, cell biology, biochemistry, physics, genetics, organic and analytical chemistry are strongly encouraged. Undergraduate mathematics through calculus is also recommended.
  International students must submit scores from the Test of English as a Foreign Language (**TOEFL)** earned within the last two years. Applicants with scores of 600 (paper-based) or 250 (computer-based) or higher will be considered.

All students in the program receive a stipend (currently $25,000), tuition and fees, and single coverage health insurance. Support is provided by the Theme, by the student's mentor, or through one of many fellowship programs.

Overview of the Program

The program emphasizes interdisciplinary training in all areas of modern microbiology. The first year of the program involves fundamental coursework and three research-based rotations in laboratories of the student's choosing. A qualifying examination is held in the second year. Advanced coursework, journals clubs, and dissertation research occur in the second and subsequent years. It is expected that completion of the program will require five to six years.

To broaden their research experience, students are introduced to research at the national and international levels through seminars presented by outside speakers and by attendance at national and international scientific meetings. Students take an active role in inviting and hosting speakers at UAB, and they are strongly encouraged to present their own results at outside meetings. An annual retreat held off-campus allows students to present their research and fosters collegiality between students, postdoctoral fellows, and faculty.

Additional Information

Deadline for Entry Term(s):	Consult Program Director for information
Deadline for All Application Materials to be in the Graduate School Office:	Domestic Applications: Jan 31 International Applications: Jan 15
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE

For detailed information, contact Dr. Janet Yother, Program Director, UAB Microbiology Graduate Theme, University of Alabama at Birmingham, BBRB 661, Birmingham, Alabama 35294-2170.

Telephone (205)934-9531

Fax (205)996-6749

E-mail **jyother@uab.edu**

Web www.uab.edu/micro

Course Descriptions

Microbiology Theme

Graduate Biomedical Sciences Core Curriculum

Block 1 - Biochemistry/Metabolism

- Amino acids and primary protein structure
- Protein secondary and tertiary structure
- Postranslational modifications and allosteric changes
- Glycobiology
- Lipid structure and metabolism
- Thermodynamic principles of biochemical reactions
- Enzyme kinetics
- Enzyme mechanisms and regulation
- Amino acid/nitrogen metabolism
- Glycolysis, gluconeogenesis and citric acid cycle
- Glycogenesis, glycogenolysis and pentose phosphate pathway
- Electron transport/oxidative phosphorylation

Block 2 - Genetics/Molecular Biology

- DNA recombination
- Nucleic acids & DNA replication
- Prokaryotic transcription
- Prokaryotic translation
- Prokaryotic gene regulation
- Eukaryotic genome organization
- Eukaryotic DNA replication
- Eukaryotic transcription
- Eukaryotic translation
- Eukaryotic gene regulation I
- Eukaryotic gene regulation II
- Mendelian inheritance
- Genetic variation and polymorphisms

Block 3 - Biological Organization

- Integrated systems: From organelles to organs
- Membrane structure/function
- Cytoskeleton
- Secretion

- Endocytosis, lysosomal targeting, protein degradation
- Biochemistry of signal transduction
- Cell cycle
- Cell-cell junctions and polarity
- ECM and ECM-cell interactions
- Cell motility
- Apoptosis
- Discipline of pharmacology
- Pharmacokinetics

Advanced Courses and Journal Clubs

Department of Biochemistry and Molecular Genetics

BMG 731. Advanced Eukaryotic Molecular Genetics.

BMG 732. Mechanisms of Enzyme Catalysis.

BMG 733. Fermentation Technology.

BMG 734. Protein Structure.

BMG 735. Genomic Engineering Using Lambda Red

BMG 743. Advanced Metabolism.

BMG 747. Connective Tissue Biochemistry.

BMG 748. Membranes and Organelles.

BMG 751. Advanced Virology.

BMG 753. Protein Crystallography.

BMG 757. Physical Biochemistry.

BMG 758. Structure of Nucleic Acids.

BMG 759. Macromolecular Modeling.

BMG 760. Nuclear Magnetic Resonance.

BMG 761. Advanced Eukaryotic Molecular Biology.

BMG 762. Human Biochemistry and Genetics.

BMG 771. Dental Biochemistry.

BMG 775. Special Topics in Biochemistry.

BMG 776-780. Special Topics in Biochemistry.

BMG 781-785. Advanced Special Topics.

BMG 786. Journal Club in Free Radicals and Biology Oxidations.

BMG 787. Journal Club in Molecular Structure.

BMG 788. Journal Club in Fermentation.

BMG 789. Journal Club in Biological Crystallography.

BMG 790. Journal Club in Developmental Biology.

BMG 791. Journal Club in Gene Therapy.

BMG 792. Journal Club in Physical Biochemistry.

BMG 793. Journal Club in DNA Virology.

BMG 794. Journal Club in Molecular Neurobiology.

BMG 795. Journal Club in Molecular Biology.

BMG 796. Journal Club in Advanced Eukaryotic Molecular Biology.

Department of Cell Biology

CB 710. Extracellular Matrix and Cell Behavior.

CB 711. Cell Adhesion and Extracellular Matrix.

CB 712. Developmental Biology.

CB 713. Growth Factors Journal Club.

CB 715. Current Topics in Cell Biology.

CB 722. Vascular Biology.

CB 723. Membranes & Glycobiology.

CB 726. Genetics in Cell Biology.

CB 728. Cell Biology of Human Disease.

CB 729. Mechanisms of Signal Transduction.

CB 748. Special Problems in Cell Biology.

CB 756. Molecular Biology of Cell Adhesion.

Department of Microbiology

MIC 720. Advanced Topics in Microbiology I.

MIC 721. Advanced Topics in Microbiology II.

MIC 723. RNA Virus Journal Club.

MIC 737. Mucosal Immunology Journal Club.

MIC 753. Practical Application of Sequence Analysis Software.

MIC 772. Bacterial Pathogenesis Journal Review & Research Workshop.

MIC 780. Selected Readings in Molecular Cell Biology.

MIC 785. Biology of Parasitism Discussion Group.

MIC 786. Retrovirology Journal Club.

MIC 789. Journal Club in Biological Crystallography.

MIC 794. Structural Virology Journal Club.

MIC 796. Neuroimmunology Journal Club.

MIC 797. Cellular and Molecular Immunology Journal Club.

MIC. Pathogenesis of Gram-Positive Bacteria

Neuroscience (Ph.D.)

Director: Dr. Scott Wilson

Phone: (205) 975-5573

E-mail: livvy01@uab.edu

Web site: http://www.neuroscience.uab.edu

Faculty

Faculty Member	Department(s)	Research Area
Amthor, Franklin	Neurobiology Vision Sciences	Retinal Physiology, Neural Information Processing
Anantharamaiah, G.M.	Biochemistry & Molecular Genetics Medicine	Apolipoproteins, Amphipathic Helices and Atherosclerosis
Berdiev, Bakhrom	Cell Biology	The CFTR Chloride Channel control of Epithelial Sodium Channel under physiological and pathological conditions.
Bevensee, Mark	Neurobiology Physiology & Biophysics	Cellular and Molecular Physiology of Acid-base Transporters and pH Regulation
Blalock, J. Edwin	Cell Biology Neurobiology Physiology & Biophysics Physiology & Biophysics	Rational Drug and Vaccine Design/Neutrophilic Inflammation

Brenner, Michael	Neurobiology	Molecular Sudies of Astrocytes in Health and Disease
Britt, William	Microbiology Neurobiology	Human Herpesviruses, Molecular Virology and Pathogenesis
Busettini, Claudio	Vision Sciences	Eye movements in a three-dimensional environment
Carroll, Steven	Cell Biology Neurobiology Pathology	The Role of Neuregulin-1 in Peripheral Nervous System Neoplasia
Clinton, Sarah	Neurobiology	
Cowell, Rita	Cell Biology Neurobiology	Transcriptional regulation of interneuron-specific genes in development and neurodegeneration
de Sarno, Patrizia	Psych-Behavioral Neurobiology	
Detloff, Peter	Biochemistry & Molecular Genetics Neurobiology	Mouse Models of Human Genetic Disorders
Dobrunz, Lynn	Neurobiology Physiology & Biophysics	Synaptic Transmission and Plasticity in Hippocampus
Floyd, Candace	Neurobiology	Neuronal-Glial Interactions in Traumatic Brain and Spinal Cord Injury
Fuller, Catherine	Cell Biology Physiology & Biophysics	ENaC/ASIC Ion Channels;
Gamlin, Paul	Neurobiology Vision Sciences	Studies of the Neural Bases of Vision & Eye Movements
Gawne, Timothy	Neurobiology	Information Processing in the Central Nervous System

J.	Vision Sciences	
Gross, Alecia K.	Biochemistry & Molecular Genetics Cell Biology Neurobiology Vision Sciences	Rhodopsin trafficking in rod cells and rhodopsin-mediated retinal degenerations
Hablitz, John	Neurobiology Physiology & Biophysics	Cellular Mechanisms of Neurotransmission
Kadisha, Inga	Cell Biology	
Kana, Rajesh Kumar	Neurobiology	
Kerman, Ilan	Psych-Behavioral Neurobiology	
Kesterson, Bob	Genetics	Hypothalamic Control of Feeding Behavior
Kim, Helen	Biochemistry & Molecular Genetics Neurobiology Pharmacology & Toxicology	Proteomics of neuroprotective and chemopreventive actions of dietary phytochemicals
King, Gwendalyn D.	Cell Biology Neurobiology Physiology & Biophysics	Role of Klotho in aging and the brain
King, Peter	Physiology & Biophysics	Mechanisms of Growth Factor mRNA Stabilization in Cancer
Kirk, Kevin	Neurobiology Physiology &	The CFTR Chloride Channel

	Biophysics	
Korf, Bruce	Genetics	Neurofibromatosis Type 1
Kraft, Timothy	Neurobiology Vision Sciences	Physiology and Pathophysiology of Photoreceptors
Lahti, Adrienne	Psych-Behavioral Neurobiology	
Lesort, Mathieu	Cell Biology Pharmacology & Toxicology	Pathogenesis of Huntington's Disease: from models to therapeutic targets
Lester, Robin	Neurobiology Physiology & Biophysics	Molecular & Cellular Mechanisms of Nicotine Addiction
Li, Ling	Genetics Medicine Neurobiology Pathology	Connections Between Atherosclerosis, Diabetes, and Alzheimer's Disease
Li, Xiaohua	Cell Biology Neurobiology Pharmacology & Toxicology	Neurobiology of mood disorders
Li, Yuqing	Neurobiology	Pathophysiology and experimental therapeutics of dystonia and related movement disorders. Basal ganglia function and dysfunction. Molecular and cellular mechanism of learning and synaptic plasticity
Liu, Rui-Ming	Pharmacology & Toxicology	
Loop, Michael	Neurobiology Vision Sciences	Visual psychophysics, color vision/vertebrate

Lubin, Farah D.	Cell Biology Neurobiology	Epigenetic NF-kB signaling regulation of the BDNF gene in synaptic plasticity; Epigenetic regulation of the NR2B gene in epilepsy; Epigenetic NF-kB signal transduction in memory formation;
Markert, James	Cell Biology Physiology & Biophysics	Engineering Herpes Simplex Viruses for the Therapy of Cancer
McMahon, Lori	Neurobiology Physiology & Biophysics	Synaptic plasticity and hippocampal dependent learning
Melendez-Ferro, Miguel	Cell Biology	
Olsen, Michelle	Neurobiology Physiology & Biophysics	Glial potassium channels and glutamate transporters in injury and abnormal development
Owsley, Cynthia	Vision Sciences	Visual Psychophysics, Aging
Parpura, Vladimir	Neurobiology	The role of glial cells in physiology of nervous system.
Perez-Costas, Emma	Cell Biology Neurobiology	
Pozzo-Miller, Lucas D.	Cell Biology Neurobiology Physiology & Biophysics	Neurotrophins, Ca2+ Signaling, Synapse Development and Plasticity, Mental Retardation, Rett Syndrome
Qin, Hongwei	Cell Biology	
Raman, Chander	Medicine Microbiology	Lymphocyte activation, immune tolerance and autoimmunity tolerance and autoimmunity
Roberson, Erik	Neurobiology	Neurobiology of Alzheimer's Disease and Frontotemporal

		Dementia
Roth, Kevin	Cell Biology Neurobiology Pathology	Molecular Regulation of Neuronal Cell Death
Shacka, John	Pathology	Regulation of Neuronal Survival in Disease and Injury by the Autophagy Lysosome Pathway
Sontheimer, Harald	Cell Biology Neurobiology Physiology & Biophysics	The Role of Neuroglia in Brain Function and Disease
Standaert, David G.	Cell Biology Neurobiology	Translational Research in Neurodegenerative Diseases
Stover, Natividad P.	Neurology	
Sweatt, J. David	Genetics Neurobiology Physiology & Biophysics	Signal Transduction Mechanisms in Learning and Memory
Sztul, Elizabeth	Cell Biology Physiology & Biophysics	Membrane Traffic; Protein Degradation
Theibert, W. Anne	Cell Biology Neurobiology Physiology & Biophysics	Role of phosphoinositides in developmental neurobiology
Tucholski, Janusz	Psych-Behavioral Neurobiology	Cellular and molecular biology of neuroblastoma. Response of neuronal cells and neurons to stress.
Van Groen,	Cell Biology	

Thomas		
Wadiche, Jacques	Cell Biology Neurobiology Physiology & Biophysics	Synaptic transmission and glutamate transporters
Wadiche, Linda	Cell Biology Neurobiology Physiology & Biophysics	The function of adult generated neurons
Wang, Qin	Neurobiology Physiology & Biophysics	Regulation of GPCR trafficking, signaling and in vivo functions
West, Andrew	Genetics Neurobiology	Genetic and biochemical mechanisms in neurological disorders
Wilson, Scott	Biochemistry & Molecular Genetics Genetics Neurobiology	Mouse Models of Neurodegeneration
Wyss, J. Michael	Cell Biology Medicine Neurobiology	Neuroplasticity in aging and neuro cardiovascular control
Yacoubian, Talene	Neurobiology	Role of 14-3-3 proteins in Parkinson's disease
Yang, Eddy (Shih-Hsin)	Cell Biology Pharmacology & Toxicology	Targeting DNA repair pathways to augment the therapeutic ratio for cancer patients
Zhang, Jianhua	Cell Biology Neurobiology	Mechanisms and regulation of autophagy-lysosomal pathway in health and diseases

	Pathology	
Zhang, Yuhua	Vision Sciences	

Theme Information

The UAB Neuroscience Graduate Theme is a portal into the comprehensive neuroscience research opportunities at UAB. Students entering the Neuroscience Graduate Theme will find a home and anchor for their entire graduate experience. Throughout a student's entire Ph.D. career, the faculty and staff of the Neuroscience Graduate Program provide continued support, encouragement, and guidelines for success.

The theme-based UAB Neuroscience Graduate Program seeks to equip and train students to become tomorrow's innovative neuroscientists by

- teaching basic neuroscience ideas that become stepping stones to more in-depth research
- providing unique professional and scientific avenues through which they can develop their presentation skills, learn critical thinking and how to design experiments
- offering students the opportunity to choose neuroscience research from a multitude of options available through labs all over campus, not limiting students to a department but, rather, a discipline
- providing opportunities for informal interaction with other students to discuss research, scientific writing, as well as a social network of peers to assist students in staying grounded

Students enter the neuroscience theme either through direct admit into the program or after their first year when moving into the permanent lab of a neuroscience mentor. Neuroscience theme students follow the neuroscience curriculum and do not join a departmental graduate program nor follow a departmental graduate program curriculum. The student becomes affiliated with the department in which the mentor holds his/her primary appointment for the purpose of the awarding of the degree.

Some of the affiliated departments:

- Neurobiology
- Cell Biology
- Neurology
- Psychiatry
- Pediatrics
- Pathology
- Physiology & Biophysics
- Vision Sciences

ADMISSION TO THE PROGRAM

Admission to our program is highly competitive. We generally admit only 6-7 students each year. Students admitted to our students meet and usually exceed general requirements of:

- 3.0 or above undergraduate GPA
- GRE scores of 550 or better on each section for a minimum composite score of 1100
- Strong background in biology, chemistry and/or mathematics
- Research experience
- TOEFL (for international students) of greater than 500 on paper-based test and greater than 173 on computer-based test

Required Application Materials

Domestic students: (No application fee)

- Application and personal statement
- Official transcripts from all undergraduate institutions attended
- Official GRE scores (Institutional code 1856)
- 3 letters of recommendation

International students: ($60 application fee)

- Application and personal statement
- Official transcripts from all undergraduate institutions attended
- Official GRE scores (Institutional code 1856)
- Official TOEFL scores
- 3 letters of recommendation

All students accepted into the program receive

- ***free tuition***
- ***free health insurance***
- ***$26,000/year stipend.***

CURRICULUM

All first year students follow the same curriculum, designed to provide them with the foundations they will need as they move into permanent labs and begin their own research projects. Students begin their year attending the Intro to Neurobiology course at the Dauphin Island Sea Lab on Dauphin Island, Alabama, on the Gulf of Mexico. While there, the student is exposed to a variety of learning opportunities, including lectures, hands-on experiments, and going out into the Gulf to "fish" for marine life. Students live at

Dauphin Island, dorm style, for 2 1/2 weeks in late summer, working hard with UAB faculty and teaching assistants and playing hard during their downtime. This course provides a very unique opportunity for neuroscience students.

General Requirements for Ph.D.

- Students are required to successfully complete 2 electives prior to their last semester.
- Registration for the Student Summer Seminar Series (GBS 737) is required for each student each summer semester. Participation includes attendance, completion of an evaluation form for each speaker, and the presentation of a 20 minute PowerPoint talk and 10 minute Q-A session. Students will present once each summer. First year students are excluded from presenting.
- Students must register for and attend a seminar series of their choosing (with advice from their mentor) each semester until graduation.
- A biostatistics course is required. At this time, a particular stats course is not recommended. Work with your mentor on choosing the stats course that works best for you.
- All students must successfully complete an ethics course. This is taken during the summer semester of the student's first year (GRD 717).
- Students must register for a journal club of their choosing (with advice from their mentor) each semester until graduation.
- Two first-authored papers accepted to an appropriate journal are required unless the student's committee recommends/approves differently.
- Students must be registered for a minimum of 12 hours during the Fall semester, 12 hours during the Spring semester, and 9 hours during the Summer semester each year.
- 18 credit hours of dissertation research are required before graduation. This means you must have a minimum of two semesters between the semester of your Qualifying Exam and your final defense semester.
- You must be registered for at least 3 credit hours during the semester in which you plan to graduate.

Admission Requirements

GENERAL ADMISSION PREFERENCES FOR OUR PROGRAM:

- 3.0 or above undergraduate GPA
- GRE scores of 550 or better on each section for a minimum composite score of 1100
- Strong background in biology, chemistry and/or mathematics
- TOEFL (for international students) of greater than 500 on paper-based test and greater than 173 on computer-based test

REQUIRED APPLICATION MATERIALS: Domestic students: (No application fee)

- Application and personal statement
- Official transcripts from all undergraduate institutions attended
- Official GRE scores (Institutional code 1856)
- 3 letters of recommendation

  International students: ($60 application fee)

- Application and personal statement
- Official transcripts from all undergraduate institutions attended
- Official GRE scores (Institutional code 1856)
- Official TOEFL scores
- 3 letters of recommendation

  All students accepted into the program receive

- free tuition
- free health insurance
- $26,000/year stipend.

  Only online applications will be accepted.

Curriculum

All first year students follow the same curriculum, designed to provide them with the foundations they will need as they move into permanent labs and begin their own research projects. Students begin their year attending the Intro to Neurobiology course at the Dauphin Island Sea Lab on Dauphin Island, Alabama, on the Gulf of Mexico. While there, the student is exposed to a variety of learning opportunities, including lectures, hands-on experiments, and going out into the Gulf to "fish" for marine life. Students live at Dauphin Island, dorm style, for 2 1/2 weeks in late summer, working hard with UAB faculty and teaching assistants and playing hard during their downtime. This course provides a very unique opportunity for neuroscience students.

General Requirements for Ph.D.

- Students are required to successfully complete 2 electives prior to their last semester.
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- A biostatistics course is required. At this time, a particular stats course is not recommended. Work with your mentor on choosing the stats course that works best for you.
- All students must successfully complete an ethics course. This is taken during the summer semester of the student's first year (GRD 717).
- Students must register for a journal club of their choosing (with advice from their mentor) each semester until graduation.
- Two first-authored papers accepted to an appropriate journal are required unless the student's committee recommends/approves differently.
- Students must be registered for a minimum of 12 hours during the Fall semester, 12 hours during the Spring semester, and 9 hours during the Summer semester each year.
- 18 credit hours of dissertation research are required before graduation. This means you must have a minimum of two semesters between the semester of your Qualifying Exam and your final defense semester.
- You must be registered for at least 3 credit hours during the semester in which you plan to graduate.

Additional Information

Deadline for Entry Term(s):	Consult Program Manager for information
Deadline for All Application Materials to be in the Graduate School Office:	Domestic preferred deadline: April 30 International Applications: Jan 15
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)

For detailed information, contact:

Scott Wilson, Ph.D.
Associate Professor and Program Director
of Physiology and Neurobiology
UAB Department of Physiology and Biophysics
SHEL 914 / 1825 University Boulevard
Birmingham, AL 35294-2182
Tel: 205.975.5573
Email: livvy01@uab.edu

Patricia Matthews
Program Manager
UAB Neuroscience Graduate Program
SHEL 120C / 1825 University Boulevard
Birmingham, AL 35294-2182
Tel: 205.934.7034
Fax: 205.996.6749
Email: pm1@uab.edu

Pathobiology and Molecular Medicine (Ph.D.)

Theme Directors: Dr. Michelle V. Fanucchi
fanucchi@uab.edu
(205) 934-7230

Dr. Rakesh P. Patel
rakeshp@uab.edu
(205) 975-9225

Web site: http://www.uab.edu/pbmm

Faculty

Edward Acosta, Associate Professor (Clinical Pharmacology); multicenter clinical trials designed to assess the absorption and disposition of antiviral and antiretroviral drugs

Anupam Agarwal, Professor (Medicine); Regulation of heme oxygenase gene expression in kidney and vascular injury

Stephen Aller, Assistant Professor (Pharmacology and Toxicology); mechanism and function of integral membrane proteins involved in human disease and the means by which drug molecules and antibodies activate and inhibit function

Peter G. Anderson, Professor (Pathology and Genomics & Pathobiology); Cardiovascular pathology; education

Shannon M. Bailey, Associate Professor, Molecular Mechanisms of Chronic Alcohol and Obesity Induced Liver Diseases; Mitochondrial Dysfunction in Disease; Molecular Bioenergetics; Functional Proteomics; Free Radical Biology

Daniel Balkovetz, Associate Professor (Medicine), Epithelial Cell Biology; Epithelial Cell Cycle Regulation; Regulation of paracellular transport across epithelial cell tight junctions

Scott Ballinger, Associate Professor (Pathology); Cardiovascular disease mediated by free radicals, mitochondrial damage, and dysfunction

Marcas Bamman, Professor (Physiology & Biophysics); exercise physiology

Stephen Barnes, Professor (Pharmacology & Toxicology), Site-directed mutagenesis of rodent liver bile acid CoA: amino acid N-acyltransferase (BAT) - this project involves a combination of molecular biology, enzymology and protein mass spectrometry; Molecular basis of prevention of eye cataract disease by polyphenol-containing dietary supplements; Site-specific modification of lens proteins by oxidants - this project involves protein mass spectrometry and other physical chemical techniques

Zsuzsanna Bebok, Assistant Professor, Membrane protein biogenesis in epithelial cells (CFTR as model). Unfolded protein response.

Susan Bellis, Associate Professor (Physiology & Biophysics)

Bakhrom Berdiev, Assistant Professor (Cell Biology); The CFTR Chloride Channel control of Epithelial Sodium Channel under physiological and pathological conditions

Mark Bevensee, Associate Professor (Neurobiology, Physiology & Biophysics); Cellular and Molecular Physiology of Acid-base Transporters and pH Regulation

Mary-Ann Bjornsti, Professor (Pharmacology and Toxicology); Cancer-based pharmacology and toxicology

J. Edwin Blalock, Professor (Cell Biology, Neurobiology, Physiology & Biophysics); Rational Drug and Vaccine Design/Neutrophilic Inflammation

S. Louis Bridges, Jr., Professor; Genetics of rheumatoid arthritis

Donald J. Buchsbaum, Professor (Radiation Oncology)

Daniel Bullard, Associate Professor (Comparative Medicine); Adhesion Molecules in Inflammatory Disease

Steven Carroll, Professor (Neuropathology)

John Chatham, Associate Professor (Cell Biology, Medicine, Physiology & Biophysics); Cardiomyocyte function and metabolism in diabetes and ischemic heart disease

Irshad Chaudry, Professor (Microbiology, Pathology, Physiology & Biophysics); Cardiovascular/Immunological Alterations Following Trauma-Sepsis

Yabing Chen, Assistant Professor (Pathology); Oxidative stress-induced molecular signals in cardiovascular disease and bone disease.

James F. Collawn, Professor (Cell Biology); Molecular Mechanisms of Protein Trafficking

Yingzi Cong, Assistant Professor (Medicine); Mucosal immunology

Rita Cowell, Assistant Professor (Cell Biology, Neurobiology); Transcriptional regulation of early postnatal brain development: Insights into the pathology of Autism and Schizophrenia

Randy Cron, Associate Professor (Medicine); Immunotherapy

Victor Darley-Usmar, Professor (Pathology); Failure of the vasculature; Production of free radicals and their interactions; Molecular events controlling NO signaling pathways

Randall S. Davis, Associate Professor (Biochemistry & Molecular Genetics, Medicine, Microbiology); Fc receptors, lymphocyte development

Lawrence DeLucas, Professor (Biochemistry & Molecular Genetics, Physiology & Biophysics); Protein Crystallography/Protein Crystal Growth

Louis Dell'Italia, Professor (Medicine); Cardiovascular Disease

Peter Detloff, Associate Professor (Biochemistry & Molecular Genetics, Neurobiology); Mouse Models of Human Genetic Disorders

Patricia DeVilliers, Assistant Professor (Pathology); Novel Target for Head and Neck Cancer: The Sonic Hedgehog Pathway

Dale A. Dickinson, Assistant Professor (Environmental Health Sciences); Molecular Mechanisms of the Adaptive Response to Environmental Toxicants and Pollutants; Mechanism of Action of Naturally Occurring Compounds; Functional Genomics and Proteomics of Naturally Occurring Compounds; Induction of Glutathione; Free Radical Biology

Qiang Ding, Assistant Professor (Medicine); Signaling proteins and molecular mechanisms regulating cell migration and myofibroblast differentiation, and their roles in the development of pulmonary fibrosis

Jeffrey C. Edberg, Associate Professor; Fc receptors, rheumatoid arthritis

Charles O. Elson III, Professor; Mucosal immunology

Isam-Eldin Eltoum, Professor (Pathology);

Maaike Everts, Assistant Professor (Pathology); Gene therapy and nanotechnology for imaging and therapy of cancer

Charles N. Falany, Professor (Pharmacology and Toxicology); Protein Chemistry and Molecular Biology of Drug Metabolizing Enzymes and Molecular Biology of Bile Acid-Conjugating Enzymes

Michelle Fanucchi, Associate Professor (Environmental Health Sciences); Pulmonary cell biology and toxicology. Cell-to-cell interactions in the developing lung as well as in repair after lung injury and disease in children. The role of biochemical defense mechanisms native to pulmonary cells. Childhood lung disease and its etiology. Drug metabolism.

Xu Feng, Associate Professor; Bone Metabolism in RRANKL/RANK signaling in osteoclast differention and function

Jose R. Fernandez, Associate Professor (Nutrition Sciences); Gene Mapping, Genetic Admixture, Racial Differences, Obesity, Diabetes

Candace Floyd, Assistant Professor (Neurobiology); Neuronal-Glial Interactions in Traumatic Brain and Spinal Cord Injury

Stuart J. Frank, Professor (Medicine); Growth Hormone Receptor Structure-Function, Growth Hormone Signaling

Andra Frost, Associate Professor (Pathology); Effects of the microenvironment on breast carcinogenesis

Catherine Fuller, Associate Professor (Physiology & Biophysics); ENaC/ASIC Ion Channels

Shawn F. Galin, Associate Professor (Medicine)

Paul Gamlin, Professor and Chair (Neurobiology, Vision Sciences); Studies of the Neural Bases of Vision & Eye Movements

W. Timothy Garvey, Professor (Nutrition Sciences); Molecular, Metabolic, and Genetic basis of type 2 diabetes mellitus, insulin resistance, and obesity.

James F. George, Associate Professor; Transplantation

Paul Goepfert, Associate Professor; Immune responses to HIV

Lisa Guay-Woodford, Professor (Medicine); Characterizing molecular determinants involved PKD pathogenesis

John Hablitz, Professor (Neurobiology, Physiology & Biophysics); Cellular Mechanisms of Neurotransmission

James Hagood, Professor (Pediatrics); Role of Fibroblasts in Tissue Remodeling

Robert W. Hardy, Associate Professor (Pathology); Insulin resistance; cancer cell proliferation

Laurie Harrington, Assistant Professor (Cell Biology); Protective and Pathogenic CD4 T Cell Responses

Hui-Chen Hsu, Associate Professor; Autoimmunity

Karen Iles, Associate Professor (Anesthesiology)

Nirag Jhala, Professor (Pathology); Cytopathology and gastrointestinal tract pathology

Inga Kadisha, Instructor (Cell Biology)

Santosh Katiyar, Associate Professor (Dermatology); Prevention of skin cancer by dietary antioxidants

Helen Kim, Associate Professor (Biochemistry & Molecular Genetics, Neurobiology, Pharmacology & Toxicology); Proteomics of neuroprotective and chemopreventive actions of dietary phytochemicals

Robert Kimberly, Professor (Medicine); Autoimmunity, Molecular Mechanisms and Genetic Risk

Jennifer King, Assistant Professor (Pharmacology and Toxicology); pharmacokinetics and pharmacogenetics; multicenter clinical trials designed to assess the absorption and disposition of antiviral and antiretroviral drugs

Peter King, Professor (Physiology & Biophysics); Mechanisms of Growth Factor mRNA Stabilization in Cancer

Kevin Kirk, Professor (Neurobiology, Physiology & Biophysics); The CFTR Chloride Channel

David D. Ku, Professor (Pharmacology and Toxicology, Cardiovascular Disease); Cardiovascular and Coronary Pharmacology; Role of Thrombin, Endothelium, and Platelets in Coronary Vasospasm and Ischemic Heart Disease

Jack Lancaster, Professor (Anesthesiology, Physiology & Biophysics); The Biophysics and Biochemistry of Nitric Oxide

Aimee Landar, Assistant Professor (Pathology); Cellular effects of post-translational modification of protein thiols by reactive species in cancer and cardiovascular disease

Xiaohua Li, Associate Professor (Cell Biology, Neurobiology, Pharmacology & Toxicology); Neurobiology of mood disorders

Yuqing Li, Associate Professor (Neurobiology); Pathophysiology and experimental therapeutics of dystonia and related movement disorders. Basal ganglia function and dysfunction. Molecular and cellular mechanism of learning and synaptic plasticity

Nita A. Limdi, Assistant Professor (Neurology)

Fang-Tsyr (Fannie) Lin, Assistant Professor (Cell Biology); Regulation of Cell Growth by G Protein-Coupled Receptor Signaling

Weei-Chin Lin, Associate Professor (Cell Biology); Cell Cycle Control and DNA Damage Response

Rui-Ming Liu, Associate Professor (Environmental Health Sciences); Glutathione, aging, age-related diseases, fibrosis, cancer

Robin Lorenz, Professor (Pathology); Immune mediators of gastrointestinal disease

Clint Lothrop, Professor (Biochemistry & Molecular Genetics)

Upender Manne, Associate Professor (Anatomic Pathology)

Roslyn Mannon, Professor (Medicine); Translational Approaches to the Pathogenesis and Treatment of Chronic Graft Injury

Carmel McNicholas, Instructor (Physiology and Biophysics); Structure-Function and Regulation of Ion Channels of the Renal and Cardiovascular System

Joseph L. Messina, Professor (Pathology); Insulin and growth hormone action and resistance in trauma and infections

John D. Mountz, Professor; T cells in autoimmunity

Joanne E. Murphy-Ullrich, Professor (Pathology); Regulation of cell death and motility by cell adhesion signaling and role of growth factor control in diabetic and fibrotic diseases

Moon H. Nahm, Professor (Pathology); Immune response to pneumococcal polysaccharide antigens

Robert Novak, Professor (Medicine, Microbiology)

Suzanne Oparil, Professor (Medicine, Physiology & Biophysics); Molecular and Cellular Mechanisms of Cardiovascular Disease

John Parant, Assistant Professor (Pharmacology and Toxicology); regulation as well as cause of genomic instability in cancer and other diseases

Boris Pasche, Professor and Director (Cell Biology, Medicine)

Rakesh Patel, Associate Professor (Pathology); Inflammation; free radicals; atherosclerosis; sepsis; nitric oxide; hemoglobin; antioxidants; endothelial cell biology

Ji-Bin Peng, Assistant Professor (Medicine, Physiology & Biophysics); Calcium transport proteins and their roles in health and disease

Dennis J. Pillion, Professor (Pharmacology and Toxicology); Endocrine Pharmacology; Administration of Insulin in Eye Drops and Nose Drops; Diagnosis and Treatment of Diabetes Mellitus

Selvarangan Ponnazhagan, Professor (Pathology); Adeno-associated virus gene therapy

Edward Postlethwait, Professor and Chair (Environmental Health Sciences); Environmental Induction of pulmonary epithelial injury

Meredith A. Preuss, Assistant Professor (Medicine)

Hongwei Qin, Assistant Professor (Cell Biology)

Raghavan Raju, Associate Professor; Acute inflammation

Michael Reddy, Professor (Periodontology)

Erik Roberson, Assistant Professor (Neurobiology); Neurobiology of Alzheimer's Disease and Frontotemporal Dementia

Kevin Roth, Professor and Chair (Cell Biology, Neurobiology, Pathology); Molecular Regulation of Neuronal Cell Death

Paul Sanders, Professor (Medicine, Physiology & Biophysics); Mechanisms of Disease Progression in the Kidney

Ralph D. Sanderson, Professor (Pathology): Tumor microenvironment, cancer progression and metastasis, heparanase, heparan sulfate proteoglycans

Lisa Marshall Schwiebert, Associate Professor (Physiology & Biophysics); Inflammatory Responses

Rosa Serra, **Associate** Professor (Cell Biology); Mechanism of TGF-ß Action in Developmental and Disease Processes

John Shacka, **Assistant** Professor (Pathology); Regulation of Neuron Death by the Autophagy Lysosome Pathway

Anath Shalev, Professor (Medicine); Molecular biology and diabetes, beta cell biology, apoptosis, oxidative stress, transcriptional regulation of gene expression, diabetes complications

George M. Shaw, Professor (Medicine, Microbiology); Evolution, Persistence and Pathogenesis of HIV-1; HIV/AIDS Vaccine Development

Peter R. Smith, Associate Professor (Physiology and Biophysics); The Role of the Membrane Cytoskeleton in Regulating the Cell Surface Expression of Epithelial Transport Proteins

Monsheel Sodhi, Assistant Professor (Neurobiology); Genetic and transcriptional variation in psychosis, depression and suicide

Yuhua Song, Assistant Professor (Biochemistry & Molecular Genetics); Genetic Multiscale Modeling in Biology and Biomechanics

Harald Sontheimer, Professor (Cell Biology, Neurobiology, Physiology & Biophysics); The Role of Neuroglia in Brain Function and Disease

Eric Sorscher, Professor (Genetics, Medicine, Physiology & Biophysics); Cystic Fibrosis and Molecular Genetics; Patient Oriented Research

David G. Standaert, Endowed Professor (Cell Biology, Neurobiology); Translational Research in Neurodegenerative Diseases

Theresa Strong, Associate Professor (Biochemistry & Molecular Genetics, Genetics, Medicine); Identification of Tumor Antigens and Development of Cancer Vaccines

David J. Sweatt, Professor (Genetics, Neurobiology, Physiology & Biophysics); Signal Transduction Mechanisms in Learning and Memory

Laura Timares, Assistant Professor (Dermatology); Engineering Dendritic Cells for Immunotherapy

Thomas Van Groen, Associate Professor (Cell Biology)

Robert van Waardenburg, Assistant Professor (Pharmacology and Toxicology); Drug interaction, cancer pharmacology

Mei Wan, Assistant Professor (Pathology), TGF-beta signaling in pancreatic cancer development and in bone diseases

Jianbo Wang, Assistant Professor (Cell Biology); Novel signaling pathway termed planar cell polarity (PCP) pathway and how this pathway regulates morphogenesis in mammals.

Qin Wang, Associate Professor (Cell Biology, Neurobiology, Physiology & Biophysics); Regulation of GPCR cellular responses and in vivo functions

Douglas A. Weigent, Professor (Physiology and Biophysics); Immunoendocrinology

Roger C. White, Associate Professor (Medicine, Physiology & Biophysics); Oxidant Stress and Endothelial Dysfunction

Hui Wu, Assistant Professor (Microbiology); Bacteria- host interaction

Talene Yacoubian, Assistant Professor (Neurobiology); Role of 14-3-3 proteins in Parkinson's disease

Yang Yang, Assistant Professor (Pathology); Targeting heparan sulfate for myeloma therapy

Bradley K. Yoder, Professor (Cell Biology); Polycystic Kidney Disease

Karina Yoon, Assistant Professor (Pharmacology and Toxicology); Drug interaction, cancer pharmacology

Martin E. Young, Associate Professor (Medicine); cardiovascular disease

Nabiha Yusuf, Instructor (Dermatology)

Allan J. Zajac, Associate Professor; Immunovirology

Majd Zayzafoon, Assistant Professor (Pathology); The Role of Calcium Signaling in the Genetic and Epigenetic Pathogenesis of Disease

Jianhua Zhang, Assistant Professor (Cell Biology, Neurobiology, Pathology); cell and molecular mechanisms, and mouse models of autophagy in development, neurological and psychiatric diseases

Yuhua Zhang, Assistant Professor (Ophthalmology)

Theme Information and Course Requirements

The Pathobiology & Molecular Medicine (PBMM) Graduate Program at UAB is the successor of the popular and highly successful Integrative Biomedical Sciences Graduate Program established in 1999. PBMM represents an expansion of the Integrative Biomedical Sciences Program and is designed to give students the very best multidisciplinary training within the emerging and exciting field of molecular medicine. The main objective of the program is to expose students to a diverse faculty with research interests that range from molecules - to whole organisms - to disease processes - to new therapies. Our premise is that students, when trained in basic principles of molecular and cellular biology, in addition to organ-based physiology, pharmacology and pathology, will be prepared to study biological processes at any level of organization. The important biomedical issues of today are sufficiently complex that the successful investigator must be able to tackle these issues using integrated, multi-faceted approaches.

The advantage of joining PBMM is that students have full access to all faculty within the GBS, including those not within PBMM. This gives students the broadest opportunity possible to move their studies in the direction that they find most interesting. In addition, PBMM is composed of over 125 active research

faculty that are utilizing state-of-the-art resources and ideas to drive the field of molecular medicine forward. Within PBMM, you will have the opportunity to immerse yourself at the leading edge of biomedicine and share in the excitement first-hand by working alongside research pioneers.

During your first year, you will complete a series of rigorous courses that includes training in biochemistry, molecular biology, genetics, cellular physiology and pathobiology. You will also have the opportunity to take courses within designated "Focus Areas." These Focus Areas are organized around specific research strengths represented by faculty within the PBMM and address important issues in diseases such as diabetes, heart disease and cancer among others. In addition, you will have full access to courses offered by other programs within the GBS where strengths exist in multiple fields including immunology, neuroscience, structural biology and others. There will also be ample time allotted for you to attend research seminars, learn to make scientific presentations and to perform 3-4 laboratory rotations. These rotations are designed to give the student a practical introduction to bench research and to help the student choose a faculty mentor. After the first year there will be additional coursework directed in your area of interest, but the main focus will be on intensive research training within the laboratory. Here, guided by your mentor and graduate advisory committee, you will develop critical technical and analytical skills that will form the basis of your dissertation research.

Graduates of the PBMM training program will be fully prepared to address the most complex and challenging issues in disease biology and therapy and be well positioned to pursue work in academic, industrial or government research or related positions. Training for the PhD degree is generally completed within four to six years, depending on the student's background and training goals.

Admission Requirements

UNDERGRADUATE EDUCATION

A **baccalaureate degree in the natural or physical sciences** is required. Undergraduate level courses in organic and analytical chemistry, cell biology, biochemistry and genetics are strongly encouraged. Undergraduate mathematics through calculus and physics are also recommended.

GRADES & SCORES

The Graduate School recommends that entering students have a minimum grade point average (**GPA**) of 3.0 on a 4.0 scale and a minimum combined verbal/quantitative score on the Graduate Record Exam (**GRE**) of 1100.

International students must submit scores from the Test of English as a Foreign Language (**TOEFL)** earned within the last two years. Applicants with scores of 600 (paper-based) or 250 (computer-based) or higher will be considered.

RESEARCH

Most students admitted to the program have undergraduate or postgraduate **research experience**.

APPLICATION REVIEW

Applications are reviewed by the GBS Admissions Committee, representing all GBS thematic programs. **Acceptance** will be based on a combination of factors including:

- Undergraduate performance (both the curriculum and grade point average)
- Letters of recommendation
- GRE scores
- A personal statement of research and career interests
- Previous research experience
- Personal interview, at program expense (international applicants may be interviewed by phone or video conference)

Admission to our Programs is very competitive and the number of positions is limited; thus not every qualified applicant can be offered a position.

Academic Program

Year 1

Courses

Integrated, science-based teaching is the foundation of every PBMM course. You will learn from a team of faculty that will contribute their expertise in the basic biology and physiology of each topic coupled with an emphasis on understanding relevant diseases, clinical correlates, and therapeutic approaches. The lectures also emphasize the scientific techniques and experimental approaches that are essential to the concepts being discussed. In addition, many instructors assign journal readings and independent projects, which may include Web-based searches or literature reviews, to actively engage you in the learning process.

• First year students in all Graduate Biomedical Sciences Themes take a common 12-week core curriculum emphasizing the fundamentals of biochemistry, genetics, and cell biology. This coursework will

include an overview of the principles of biochemistry, metabolism, molecular biology, genetics and biological organization. This will be followed by an integrated course in experimental medicine that focuses on mechanisms that drive specific diseases and exposes students to approaches being taken by UAB scientists who are addressing disease-based problems. Additional coursework in the first year will include integrative physiology, pathophysiology, endocrinology, immunology, pharmacology and molecular medicine.

• Journal Club

You will present relevant published research papers to help hone your presentation skills and to teach you to learn to think like a scientist.

• Seminar Series

Faculty from participating departments, other UAB faculty, and faculty from other institutions discuss their latest research.

• Lab Rotations (3 rotations of 10 weeks each)

Based on your specific interests, you will choose from a wide range of research laboratories available to you. This "hands on" research experience will provide you with the background to decide on a laboratory and mentor to guide you through your dissertation research.

Second year and beyond - Qualifying examination, courses, journal clubs, research, completion of degree.

Qualifying examination. Students must pass a Qualifying Examination that assesses their general knowledge, ability to read the literature, and ability to formulate and defend testable hypotheses. The examination involves a written proposal and oral defense of the proposal.

Journal Clubs. From the second year until completion of the program, students participate in a Journal Club related to their specific area of interest. The purpose of the journal club is to enhance the ability to critically read the literature and to stay abreast of current findings in the field.

Pathobiology and Molecular Medicine courses. Advanced courses in areas relevant to the student's area of interest are required and may be completed anytime from the second year on. Students are encouraged to take these courses as early as possible in order to achieve the most benefit in their training.

Dissertation research. After completion of the Qualifying Examination, and no later than the third year, the student forms a dissertation committee comprised of five faculty members (including the mentor) whose expertise will be beneficial in helping direct the research and course of study.

Awarding of the PhD degree. The PhD is awarded upon completion of the academic requirements and defense of the dissertation. The dissertation consists of a written document that is expected to include published papers or manuscripts in preparation, along with a scholarly introduction and discussion of the work that has been completed. A successful private defense of the dissertation in front of the dissertation committee is then followed by a seminar presentation and public defense of the dissertation as the final step in completion of the PhD degree.

Student Support

All students accepted into PBMM receive a **competitive annual stipend** and **fully paid tuition and fees**. Single coverage **health insurance is also provided** at no cost to the student through VIVA Health UAB.

The annual stipend for the 2011-2012 academic year is $26,000. The total annual award value, including stipend, tuition, fees and health insurance is $37,500. Stipends are reviewed and updated regularly.

First-year students are funded through the PBMM Graduate Program by Graduate School Fellowships and occasionally by other national and University fellowships. In subsequent years, students are supported through their advisor's research grants, institutional funds or training grants. In addition, highly qualified students are encouraged to apply for individual fellowship awards, with the guidance of their advisors. See **Fellowships and Awards** for additional fellowship information and resources.

Additional Information

Deadline for Entry Term(s):	Consult Program Director for information
Deadline for All Application Materials to be in the Graduate School Office:	Domestic Applications: April 1 International Applications: Feb 15
Number of Evaluation Forms Required:	Three
Entrance Tests (University Code: 1856)	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)

For detailed information, contact:

Theme Director
Michelle V. Fanucchi, Ph.D.
205.934.7230 (office)
fanucchi@uab.edu

Theme Co-Director
Rakesh P. Patel, Ph.D.
205.975.9225 (office)
rakeshp@uab.edu

Jason Noah
Theme Manager
Tel: 205.934.7810 (office)
Fax: 205.996.6749
Email: jnoah@uab.edu

Accounting (M.Ac.)

Degree Offered:	M.Ac.
Interim Director:	Dr. Lary Cowart
Phone:	(205) 934-8501
E-mail:	**lcowart@uab.edu**
Web site:	**www.uab.edu/business**

Faculty

Jim Byrd, Visiting Instructor (Accounting and Finance)

Dawn Drnevich, Assistant Professor (Accounting and Finance), Financial and Managerial Accounting

Thomas P. Edmonds, Professor (Accounting and Finance); Financial and Managerial Accounting

Gerry Grant, Visiting Associate Professor (Accounting and Finance), Accounting Information Systems

Terry Grant, Professor (Accounting and Finance), Financial Accounting

Mary Im, Assistant Professor, Governmental and Non-profit, Financial Accounting

Frank M. Messina, Professor (Accounting and Finance); Corporate Taxes

Eddie Nabors, Instructor (Accounting and Finance), Financial Accounting

Jenice Prather-Kinsey, Sallie W. Dean Scholar in Accounting, Professor in Accounting (Accounting and Finance); Managerial Accounting and International Accounting

Joshua Racca, Assistant Professor (Accounting and Finance), Taxation and Cost Accounting

Arline Savage, Professor (Accounting and Finance), Fraud and Forensic Accounting

James L. Worrell, Assistant Professor (Accounting and Finance); Internal Auditing and Information Systems

Stephen Yoder, Assistant Professor (Marketing, Industrial Distribution and Economics); Corporate Governance and Legal Studies

Mission and Objective

The mission statement of the Department of Accounting and Finance is as follows: "The Department of Accounting and Finance is committed to providing a high-quality, practice-oriented educational experience to a largely urban population. The Department will offer, through its accounting programs, an educational foundation that will prepare students for professional careers in business and accounting or enable them to pursue graduate studies. The Department will contribute to the understanding and application of accounting and business knowledge through the scholarship activities of the faculty. The Department will maintain a continuing relationship with the professional community while supporting the internal activities of the University."

The objective of the Master of Accounting Program is to further develop in students the skills required for success in the accounting profession. Offered primarily in an evening format, it is designed for those individuals with a knowledge base in accounting and business who desire to broaden their communication, interpersonal, technological, and applied research skills. The Master of Accounting Program is accredited by the AACSB International-The Association to Advance Collegiate Schools of Business (AACSB International, **www.aacsb.edu**).

Admission Requirements

Requirements for admission to the program include the following:

1. A bachelor's degree in accounting from an institution accredited by AACSB International received within the five-year period immediately preceding the desired term of enrollment (or a bachelor's degree in any discipline from a regionally accredited institution). Applicants who do not have undergraduate accounting degrees will be required to complete up to nine foundation courses in addition to the classes listed in the Program Description section and will be required to maintain at least a B average in the foundation courses numbered 300 and above. The foundation courses that must be completed are as follows:

AC 200	**Principles of Accounting I**	**AC 402**	**Income Taxation I**
AC 201	**Principles of Accounting II**	**AC 310**	**Financial Accounting II**
AC 300	**Financial Accounting I**	**AC 423**	**External Auditing**
AC 304	**Accounting Info. Systems**	**AC 430**	**Financial Accounting III**
AC 401	**Cost Accounting**		

2. A minimum score of 500 on the Graduate Management Admission Test (GMAT) administered by the Graduate Management Admission Council (GMAC, **www.mba.com**) within the five-year period immediately preceding the desired term of enrollment. **The GMAT is waived for UAB accounting graduates and other students who take all of the foundation accounting courses at the undergraduate level at UAB.**
3. Satisfactory academic performance as measured by the undergraduate accounting grade point average.
   [Note: UAB undergraduates planning to pursue the M.Ac. degree should take AC 430 and AC 423 as their two accounting electives. If they do not take AC 423, they should plan to take AC 523 as an elective in the M.Ac. program before taking AC 606.]

The following additional admission requirements may apply to international applicants:

A minimum composite score of 80 with a minimum score of 20 in each section of the Test of English as a Foreign Language (TOEFL) administered by the Educational Testing Service (ETS, www.toefl.org) within the five-year period immediately preceding the desired term of enrollment.

A "catalog match" transcript evaluation report prepared by Educational Credential Evaluators, Inc. (ECE, **www.ece.org**).

Admission to the program is competitive. The number of qualified applicants admitted may be limited as deemed appropriate by the Master of Accounting Program Committee.

Program Description—Master of Accounting

The Master of Accounting Program consists of 30 semester hours of graduate credit—21 hours of required courses and 9 hours of electives:

Required courses (7):

LS 557 Business Law for Accountants (offered in Fall only)

AC 514 Governmental and Not-for-Profit Accounting (offered Fall, Spring, Summer)

AC 580 Advanced Financial Accounting (offered in Fall only)

AC 600 Current Issues in Financial Accounting (offered in Spring only)

AC 606 Advanced Auditing and Attestation (offered in Spring only)

AC 620 Tax Entities (offered in Fall only)

AC 672 Advanced Information Technology Auditing (offered in Spring only)

Elective courses* (3):

*MAc students must choose 3 electives from the following: LS 571, AC 513, AC 523, AC 564, AC 572, AC 573, AC 574, AC 590, AC 612, AC 617or any nonfoundation MBA course numbered 600 or above approved by the M.Ac. Program Director. Students may not take any of the MBA foundation courses including MBA 609, 610, 620, 632, 633, 640, 650, or 660 for elective credit without prior approval by the M.Ac. Program Director.

Program Description—Master of Accounting with an Internal Auditing Concentration

Students who have not previously taken an internal auditing course at the undergraduate level can pursue a Master of Accounting degree with an Internal Auditing Concentration by pursuing the following program of study. The Master of Accounting Program with an Internal Auditing concentration consists of 30 semester hours of graduate credit—24 hours of required courses and 6 hours of approved electives:

Required courses for Internal Auditing Concentration (8):

LS 557 Business Law for Accountants

AC 513 Internal Auditing

AC 514 Governmental and Not-for-Profit Accounting

AC 580 Advanced Financial Accounting

AC 600 Current Issues in Financial Accounting

AC 606 Advanced Auditing and Attestation

AC 620 Tax Entities

AC 672 Advanced Information Technology Auditing

Elective courses for internal auditing concentration (2):

AC 564 Accounting Internship (must be in internal auditing)

AC 612 Corporate Governance

AC 572 Forensic Accounting and Information Technology Auditing

AC 573 Fraud Examination

Other internal audit related courses approved by the M.Ac. Program Committee.

Fast-Track Master of Accounting Program

The Fast-track Master of Accounting (M.Ac.) Program is open to high-achieving undergraduate students pursuing a BS degree in accounting at UAB. Students admitted to the Fast-Track M.Ac. Program can take up to 12 hours of graduate courses at undergraduate tuition rates while they are completing their Bachelor's degree in accounting and have these graduate courses count toward the M.Ac. degree as long as A's or B's are earned in the courses. After earning the BS degree, students in the Fast-Track Program continue pursuing the M.Ac. degree as described above. Students in the Fast-Track M.Ac. program are not required to take the GMAT.

Fast-Track M.Ac. Program Admission Requirements:

To be admitted to the Fast-Track Master of Accounting Program, students must:

- Have completed at least 15 hours of coursework at UAB.
- Be within 45 hours of graduation.
- Have a cumulative GPA of 3.4 or higher.
- Have completed the following courses with at least a "B" in each course and have at least a 3.5 average in the three courses:

  AC 300 – Financial Accounting I

  AC 304 – Accounting Information Systems

  AC 310 – Financial Accounting II

Students who think they are eligible for the Fast-Track M.Ac. Program should contact the M.Ac. Program Director at lcowart@uab.edu .

Uniform CPA Examination

Eligibility requirements for sitting for the Uniform CPA examination vary among the states. The state of Alabama, through its Accountancy Laws and the Alabama State Board of Public Accountancy (ASBPA, **www.asbpa.state.al.us**), requires that applicants for the Uniform CPA Examination hold a baccalaureate degree from an accredited institution and possess a total of 150 semester hours of postsecondary education, including at least 33 semester hours of accounting in specified areas at the upper-division or graduate level. UAB students can meet these requirements in several ways:

(1) By obtaining an undergraduate accounting degree (or its equivalent) and completing certain additional course work as specified under the Board's Accountancy Rules. Students interested in this option should contact Jessica Smith, the undergraduate accounting advisor in the School of Business for specific guidance. Those interested in this option who already hold degrees from other institutions should also contact Jessica Smith at jessmith@uab.edu .

(2) By obtaining a Master of Accounting degree. Those who hold a Master of Accounting degree from an accounting program accredited by AACSB International (as is UAB's) meet the academic requirements for taking the Uniform CPA Examination.

(3) By obtaining a Master of Business Administration degree. Those who already hold an undergraduate accounting degree (or its equivalent) and who desire a graduate degree in business may establish their academic eligibility under the Board's Accountancy Rules by completing as part of their M.B.A. requirements certain graduate accounting course work as determined by the Master of Accounting Program Director. Students interested in this option should first contact Christy Manning, the Admissions Counselor in the Graduate School of Management, at cmanning@uab.edu .

Other Professional Accounting Certifications

Other examinations leading to professional certification (CMA, CIA, CFE, CISA, etc.) generally do not require academic course work beyond the baccalaureate degree. Students interested in other accounting certifications should contact any member of the accounting faculty for further information.

Additional Information

Deadline for Entry Term(s):	The program admits every semester
Deadline for All Application Materials to be in the	Two months before term begins Summer: April 1

Graduate School Office:	Fall: July 1 Spring: Nov. 1
Number of Evaluation Forms Required:	None, unless required by Program Committee
Entrance Tests	GMAT for applicants who did not take their undergraduate accounting classes at UAB TOEFL (minimum composite score of 80 and a minimum score of 20 for each section) and TWE for international applicants whose native language is not English.
Comments	An ECE "catalog match" is required of applicants whose degrees are from foreign institutions. Inquiries regarding financial assistance should be directed to the University's Office of Financial Aid.

Contact Information

For detailed information contact the Department of Accounting and Finance:

School of Business, BEC 305

1150 Tenth Avenue South

Birmingham, AL 35294-4460

Telephone 205-934-8815

FAX 205-975-5933

E-mail, M.Ac. lcowart@uab.edu

E-mail, M.B.A. cmanning@uab.edu

Web **www.uab.edu/business**

Course Descriptions

Unless otherwise noted, all courses are for three semester hours of credit. For M.B.A. and other courses offered through the Graduate School of Management, see the M.B.A. information. Unless otherwise noted, the general enrollment requirement for Master of Accounting courses is graduate degree-seeking standing and an undergraduate accounting major or its equivalent or permission of the MAc Program Director. Graduate accounting courses are not open to nondegree students.

Accounting (AC)

513. **Internal Auditing**. Theory and practice of internal auditing and application of internal auditing principles and techniques to selected audit problems.

514. **Governmental and Not-for-Profit Accounting**. Special features of budgetary and fund accounting as applied to municipalities, other government units, and to other non-profit entities.

523. **External Auditing**. Study of the external audit function and the essential standards that govern audit practice.

530. **Advanced Financial**. Accounting. Dilutive securities, earnings per share, investments, accounting for income taxes, accounting changes and error analysis, statement of cash flows, retirement benefits, leases and selected disclosures .*Prerequisite:* AC 310

564**. Accounting Internship**. Work experience enabling students to better integrate academic knowledge with practical applications by exposure to accounting practice and the business environment. *Prerequisites*: Permission of instructor and 3.0 grade point average in all AC courses (undergraduate and graduate).

572. **Forensic Accounting and IT Auditing**. Introduction to the practice of forensic accounting and its relationship to auditing in settings characterized by extensive reliance on information technology. An emphasis on audit methodology as applied to accounting information systems.

573. **Fraud Examination**. Advanced forensic accounting concepts with a primary focus on occupational fraud and abuse-its origins, perpetration, prevention, and detection.

574. **Forensic Accounting Practicum**. Work experience requiring the application of forensic accounting concepts and methods. One to three hours. Prerequisites: AC 473/573 and LS 471/571, or permission of the instructor

580. **Advanced Financial Accounting.** Business combinations, consolidated financial statements, multinational accounting, and partnerships. *Prerequisite:* AC 430/530

590. **Advanced Topics in Accounting.** Contemporary professional accounting issues. *Prerequisite:* Permission of Instructor.

600. **Current Issues in Financial Accounting**. Consideration of recent pronouncements of various authoritative bodies such as the FASB and SEC through research projects and case discussions.

606. **Advanced Auditing and Attestation**. Study of professional standards and their application to external audits and other service engagements, with an emphasis on practical research and analysis.

612. **Corporate Governance**. Examination of the governance by boards of directors, shareholders, management and others of publicly-owned corporations, larger privately-held corporations and other complex organizations.

617. **IT enabled Business Process Management**. Concepts and applications of business process management in conjunction with project management and systems development techniques and tools. Emphasis is placed on the Association of Business Process Management Professionals' body of knowledge; best practices that support the inclusion of adequate management, accounting, and financial controls; and initiating the preparation of students for the Association of Business Process Management Professionals (ABPMP) CBPP certification exam.

620. **Tax Entities**. Basic research tools in taxation; selected parts of Internal Revenue Code and Regulations; tax planning techniques.

672. **Advanced Information Technology Auditing**. IT auditing with a focus on the role of IT audit in the financial audit profession, professional standards, and professional organizations. An emphasis on IT audit methodology as applied to financial audits and other public accounting audit services.

Legal Studies (LS)

557. **Business Law for Accountants**. The mechanics and application of the Uniform Commercial Code with emphasis on sales, commercial paper, and secured transactions; legal principles regarding trusts and estates, insurance, and business organization; and expanded treatment of the law of contracts.

571. **Legal Elements of Fraud Investigation**. Key legal principles and courtroom procedures relevant to forensic accounting, and survey of related topics-criminology theories, evidence management, and litigation services

Business Administration (M.B.A.)

Degree Offered: M.B.A.

Director: Douglas Ayers

Phone: (205) 934-8856

E-mail: dayers@uab.edu

Web site: www.uab.edu/mba

Faculty

Douglas Ayers, Director, MBA Programs, Associate Professor (Marketing, Economics, and Industrial Distribution); Business to Business Marketing, Product Management, Industrial Distribution

Theodore Bos, Professor (Accounting and Finance); Quantitative Analysis

Richard M. Burns, Associate Professor (Accounting and Finance); Financial Management, Financial Institutions

Lary B. Cowart, Assistant Professor (Accounting and Finance); Real Estate valuation and Investment Analysis, Financial Management

Paul Crigler, Instructor (Management, Information Systems, and Quantitative Methods); Management Information Systems

Manabendra Dasgupta, Associate Professor (Accounting and Finance); Economic Theory

Thomas E. DeCarlo, Professor and Ben S. Weil Endowed Chair of Industrial Distribution Marketing, Economics, and Industrial Distribution; Marketing and Sales Management

James B. Dilworth, Professor Emeritus (Management, Information Systems and Quantitative Methods); Production and Operations Management

W. Jack Duncan, University Scholar and Professor Emeritus (Management, Information Systems and Quantitative Methods); Strategic Management

Joel Dobbs, Entrepreneur in Residence, (Management, Information Systems and Quantitative Methods);

Thomas Edmonds, Professor (Accounting and Finance); Financial and Managerial Accounting

Robert Holmes, Professor Emeritus, (Management, Information Systems and Quantitative Methods); Strategic Management

Mark N. Hadley M.D. FACS, Charles A. and Patsy W. Collat Professor of Neurological Surgery (School of Medicine) and Professor (Marketing, Economics, and Industrial Distribution); Medical Supplies and Supplies Distribution

Xuan Huang, Assistant Professor (Management, Information Systems and Quantitative Methods) Statistical Quality Management, statistical modeling of financial data and quality management in health care.

Eric P. Jack, Associate Dean, Interim Dean, Associate Professor (Management, Information Systems and Quantitative Methods); Operations Management

Allen C. Johnston, Assistant Professor (Management, Information Systems and Quantitative Methods); Information Assurance, Forensic Investigations, Telecommunications Management, Object-oriented Development

Karen Kennedy, Associate Dean, Associate Professor (Marketing, Economics, and Industrial Distribution); Personal Selling and Marketing Strategy

Susan Key, Associate Professor (Management, Information Systems and Quantitative Methods); Social, Legal, and Ethical Environment of Business

Keri Larson, Assistant Professor (Management, Information Systems and Quantitative Methods); Data Management, Intro to Information Systems, and Social Media and Virtual Communities

Seung-Dong Lee, Professor (Marketing, Economics and Quantitative Methods); International Economics, Applied Economic Theory

Gail W. McGee, Professor Emeritus (Management, Information Systems and Quantitative Methods); Organizational Behavior

Nir Menachemi, Associate Professor of Healthcare Organization and Policy (Public Health) and Associate Professor of Marketing and Industrial Distribution (Marketing, Economics, and Industrial Distribution); Healthcare Policy and Healthcare Organization

Frank M. Messina, Professor and Chairman (Accounting and Finance); Systems, Taxation, Fraud Prevention

Kenneth R. Miller, Instructor (Marketing, Economics and Industrial Distribution); Business Strategy, Marketing Strategy, Sales Management, Professional Selling

Carol Motley, Associate Professor (Marketing, Industrial Distribution, and Economics); Consumer behaviors, marketing with social media

George M. Munchus, III, Professor (Management, Information Systems and Quantitative Methods); Human Resource Management, Labor Relations

Philip Musa, Associate Professor (Management, Information Systems and Quantitative Methods); Project Management, Operations Management, Supply Chain Management, and Information Systems

Thomas L. Powers, Professor (Marketing, Economics and Industrial Distribution); International Marketing, Strategic Marketing

Andreas Rauterkus, Assistant Professor (Accounting and Finance); Fixed Income, Markets and Institutions, Securities Analysis, International Finance

Stephanie Rauterkus, Assistant Professor (Accounting and Finance); Investments, Derivative Securities, Trading, Real Estate

Julio C. Rivera, Associate Professor (Management, Information Systems and Quantitative Methods); Management Information Systems

Robert A. Robicheaux, Professor, Marshall Scholar and Executive Director (Marketing, Economics and Industrial Distribution); Marketing and Retail

Grant Savage, Professor (Management, Information Systems and Quantitative Methods); Senior fellow for the Lister Hill Center for Health Policy and a senior scientist for the Center for Aging. Dr. Savage also serves as the co-director of the Healthcare Leadership Academy for UAB's academic health center

Robert A. Scott, Associate Professor Emeritus (Management, Information Systems and Quantitative Methods); Administrative Theory and Practice, Organizational Design and Development

Sanjay K. Singh, Associate Professor (Management, Information Systems and Quantitative Methods); Management Information Systems

Tommie Singleton, Associate Professor (Management, Information Systems, and Quantitative Methods); Accounting and Information Systems

John E. Swan, Professor Emeritus (Marketing, Economics and Industrial Distribution); Marketing

Richard Turpen, Associate Professor (Accounting and Finance); Financial Accounting and Auditing

Joseph G. Van Matre, Professor (Management, Economics and Quantitative Methods); Multivariate Analysis, Total Quality Management

Molly Wasko, Chair and Associate Professor (Management, Information Systems and Quantitative Methods); strategic information technologies, corporate information security and project management

Joe Walker, Associate Professor (Management, Economics and Quantitative Methods); Financial Management

Barbara Wech, Assistant Professor (Management, Information Systems and Quantitative Methods); Organizational Behavior

James L. Worrell, Assistant Professor (Management, Information Systems and Quantitative Methods); Information Systems

Nuo Xu, Assistant Professor (Management, Information Systems and Quantitative Methods); Data Mining, Decision Science, Business Intelligence

Stephen A. Yoder, Assistant Professor (Marketing, Economics and Industrial Distribution); Legal Environment of Business, Business Ethics, Business Leadership, Corporate Governance

Program Objectives

The objectives of the program are to provide professional, graduate-level education and to maintain a continuing relationship with the business community through service activities. In order to deal effectively with increasingly complex problems of organizations, managers require training in sophisticated analytical techniques, appreciation for the behavioral facets of management, and an ability to anticipate and adapt to changes in the organizational environment. The MBA program is designed to provide competency in management and to acquaint the student with all aspects of business activity. The program is decision oriented, focusing on key aspects of modern administration, and seeks to prepare graduates for leadership roles in business, industry, government, or social service.

Admission Requirements

Applicants must be holders of baccalaureate degrees from regionally accredited institutions and must present evidence including, but not limited to, admission test scores (see below) and undergraduate records indicating high promise of success in business study at the graduate level. Preference is given to applicants with a minimum of two years of professional work experience after completion of the undergraduate degree. Applicants must have completed satisfactorily an undergraduate calculus course within the previous five years of application. Students without calculus or students who took calculus more than 5 years prior to entry may prove proficiency by enrolling in a college level business calculus course or by passing 4 proficiency tests offered through the Graduate School of Management. The GSM offers a calculus review course in both fall and spring for applicants who need assistance in preparing for the proficiency exams. In addition, foreign student applications must have a minimum score of 550 on the TOEFL paper-based test or a minimum of 20 in each section and a minimum of 80 composite score on the computer-based test.

GMAT waivers may be granted for applicants with:

- a master's degree from a regionally accredited institution
- a terminal degree (M.D., Ph.D., J.D, etc.) from a regionally accredited institution
- a bachelor's degree and five or more years of progressively responsible professional work experience. Admission is competitive and based on one’s ability to perform well academically and enhance the classroom with experience. A minimum 3.0 GPA is required for applicants with less than 10 years of experience.

Interview is required.

For additional information on this policy or to see if you qualify for a GMAT waiver, please contact MBA Program Coordinator, Christy Manning at 934-8815 or cmanning@uab.edu.

Candidates interested in non-degree seeking admission must have an undergraduate cumulative GPA of 3.0 or higher. Non-degree seeking students are limited to earning 12 hours credit in this status. The option to enter as non-degree seeking will be offered to candidates who miss the application deadline for applying to the MBA program, but who submit all materials prior to the beginning of the term and meet admission requirements, provided that there are seats available. We will require a resume, copies of transcripts, and GMAT scores along with the application. Permission of the MBA Coordinator is needed in order to register for classes as a non-degree seeking student.

Graduate Certificates

Students who meet the criteria for entering as a non-degree seeking student (see above) may pursue a certificate. Degree-seeking students may pursue a certificate in addition to their degree. Both certificates are made up of 4 courses.

Certificate in Life Sciences Entrepreneurship is designed to expose business and science students to the business foundations of entrepreneurship and technology commercialization. Students work on "live" projects in interdisciplinary teams. The courses are designed to blend knowledge and experiential learning in an effort to help move technology out of the lab and into the marketplace.

Required courses:

MBA 673. Tech Venture Business Planning. The business plan is the DNA or genetic map of a technology venture. It is the foundation for the capital raise, as well as the roadmap for operational milestones. Unfortunately, most business plans focus on internal strategy rather than a comprehensive assessment of the competitive landscape. Therefore, particular attention will be paid to market research and competitive analysis. 3 hours.

MBA 681. From Idea to IPO. This course is specifically designed to give graduate students in business, medicine, and engineering a deeper understanding of the issues involved in determining how to take the right idea from the laboratory to the marketplace

MBA 690- Managing Innovation This course exposes students to the nature of innovation, how innovation occurs, barriers to innovation and how to create and sustain an environment that encourages and rewards innovation. Students will also learn how to build, manage and grow a start-up company.

Areas such as lean start-up techniques will be covered along with defining mission, vision and values, hiring and staffing and building effective business processes.3 hours.

MBA 691. Independent Study. 3 hours.

Graduate Certificate in Social Media is designed to help students and working professionals advance in their careers by improving understanding of how to use the latest social media technologies to benefit organizational stakeholders, such as managers, organizations, employees, customers and partners. Emphasis is on application of new and emerging social media technologies, to serve those currently working in the IS and marketing related fields, and to prepare individuals from other fields by building the skills needed to succeed in social media careers.

Required courses:

MBA 615 Social Media and Virtual Communities in Business

MBA 616 Web Analytics

MBA 617 Intro to Business Intelligence

A social media course from any graduate program at UAB with approval of advisor

Program Requirements

The MBA program is suitable not only for students with baccalaureate degrees in business but also for those who have degrees in engineering, science, or liberal arts.

A maximum of 51 semester hours of credit is required for completion of the MBA program; however, students with applicable undergraduate courses in business may have certain core courses (MBA 609, 620, 632, 633, 640, 650, 660) waived. A “B” average is needed in equivalent courses to waive foundation courses. The minimum degree requirement is 36 semester hours.

After the student is admitted to the program, the MBA graduate advisor is available to meet with the student, if needed, to help outline a plan of study. Each candidate for the MBA must file formal application for the degree in the Graduate School of Management Office one term prior to the expected term of graduation.

Program Information

The MBA program is taught in an evening format and is designed for students who work during the day. Most students can complete degree requirements within 2-2½ years. Concentrations are available in finance, information technology management, and health care management. Each concentration consists of nine semester hours. The MBA program is accredited by AACSB–The Association to Advance Collegiate Schools of Business.

Additional Information

Admission Terms Available	Fall, Spring and Summer
Deadline for All Application Materials to be in the Graduate School Office:	Fall admission - July 1st Spring admission - Nov. 1st Summer admission - April 1st
Number of Evaluation Forms Required:	Two letters of reference or *recommendation forms *(preferred)
Entrance Tests	GMAT (TOEFL and TWE also required for international applicants whose native language is not English.)

Contact Information

For detailed information contact Christy Manning, Coordinator of Graduate Programs in Business: School of Business, Room 210 1150 South 10th Avenue, Birmingham, Alabama 35294-4460.

Telephone 205-934-8817 or 205-934-8815

E-mail **cmanning@uab.edu**

Web **www.uab.edu/mba**

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit. Courses numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

Master of Business Administration (MBA)

609. **Financial Accounting for Managers**. Accounting fundamentals—an introduction to accounting and its role in the U.S. economy, emphasizing management's use of financial statements. 3 hours.

610. **Financial Reporting and Analysis for Management**. Determination and use of cost data for decision making, control and evaluation of performance, and formulation of goals and budgets. 3 hours. Prerequisites: MBA 609

611. **Management Information Systems**. Applications of information and management sciences to design and use of decision-oriented systems. 3 hours.

620. **Corporate Finance**. Introduction to financial management of nonfinancial corporations. Topics include time value of money, bond and stock valuation, cost of capital, capital budgeting, capital structure and dividend policy. Cases may be used. Prerequisites: MBA 609, and 660. 3 hours.

621. **Advanced Topics in Corporate Finance**. An advanced course in finance with emphasis on special topics such as financial planning, working capital management, leasing hybrid financing, international capital budgeting, etc. Case studies are used. Prerequisite: MBA 620. 3 hours.

630. **Social, Ethical, and Legal Environment**. Social, ethical, and legal environment in which business enterprise operates domestically and internationally. 3 hours.

632. **Managerial Processes & Behavior**. A study of classical and modern theories of organization, management and leadership with emphasis on applications to modern organizations. 3 hours.

633. **Operations Management**. Introduction to management planning and control techniques applicable to operations portion of various enterprises. Prerequisites: MBA 660. 3 hours.

634. **Business Strategy**. Integration of management, finance, accounting, marketing, economics, production, and decision-making concepts. Prerequisite: Last term in MBA program. 3 hours.

635. **International Business Policy**. Problems and strategic considerations of firms engaged in international business. Prerequisites: MBA 632 or equivalent. 3 hours.

640. **Applied Microeconomic Analysis**. Application of economic theory and methodology to decision making: theoretical and empirical analysis of demand, production, costs, and pricing behavior. Prerequisite: MBA 660. 3hours.

650. **Modern Marketing Concepts**. Analytical approach to business systems directing flow of goods and services from product conception and production to consumption from a marketing manager's point of view. 3 hours.

651. **Seminar in Marketing Policy**. Problems of marketing managers; planning, implementing, evaluating, and controlling marketing activities. Prerequisite: MBA 650. 3 hours.

660. **Business Statistics**. Selected statistical techniques, including statistical inference, regression, and decision theory. Application to business problems. 3 hours.

661. **Decision Science**. Introduction to topics in operations research. Prerequisite: MBA 660. 3 hours.

Electives

612.**Corporate Governance.** Federal and other laws applicable to the governance, accounting, and finance activities of publicly-owned corporations, larger privately-owned corporations and other complex business organizations. (also listed as AC 612)

615.**Technology Based Entrepreneurship**. Technology Based Entre- and Intra-preneurship. MBA 611 as the prerequisite. 3 hours.

616. **Web Analytics**. Introduces technologies and tools used to realize the full potential of web sites. The course focuses on collection and use of web data such as web traffic and visitor information to design web sites that will enable firms to acquire, convert, and retain customers. 3 hours

617. **Introduction to Business Intelligence**. Business Intelligence is an umbrella term describing a wide range of events and activities, hardware and software systems, and methods and algorithms that revolve around a central theme-using data to improve business decision making. This course is an introductory level exposition to this exciting new field with the emphasis of providing a descriptive understanding to the folowing major components of business intelligence: data warehousing, business performance management, data mining, and business intelligence implementation. 3 hours.

618. **Technology Based Project Management**. Provides the foundation for the management and successful execution of IT based projects. MBA 611 as the prerequisite. 3 hours.

622. **Portfolio Theory and Construction**. Theoretical and practical aspects of investments and portfolio management. Prerequisites: MBA 620. 3 hours.

623. **Mergers and Acquisitions**. Introduces the student to the basic terminology, theories, and empirical evidence regarding the immediate and long-term wealth effects of corporate control events such as mergers, acquisitions and divestitures. Prerequisites: MBA 620. 3 hours.

624. **Global Financial Management**. Financial analysis and decision making in international context. Prerequisite: MBA 620. 3 hours.

625. **Real Estate Decision Analysis**. Designed to provide students with the tools and analytical framework for making real estate decisions. Preq: MBA 620.3 hours.

626. **Credit Markets and Instruments**. Detailed coverage of the credit markets (Money and Bond markets) of the U.S. and an introduction to the international aspects of those instruments. Prerequisite: MBA 620. 3 hours.

627. **Financial Risk Analysis and Management**. Unifying approach to the valuation and use of derivatives in domestic and international financial risk management; exploration of issues in the measurement, analysis, and management of financial risk including interest rate, exchange rate, and commodity price risks. Prerequisite: MBA 620. 3 hours.

628. **Valuation Seminar**. A blend of theory and practice to gain knowledge and skills in the valuation of businesses and interests therein. Prerequisite: MBA 620. 3 hours.

629. **Treasury Management**. Multi-disciplinary approach to analysis of financial statements and working capital management. Financial planning, corporate liquidity, and short-term financial policy issues. Prerequisite: MBA 620. 3 hours.

636. **Human Resource Management**. Critical management theory as applied to human resource problems such as employment, employee education and training, labor-management, health and safety, compensation and human resources research. Prerequisite: MBA 632 or equivalent. 3 hours.

639. **Seminar in Management**. Current issues and problems in selected areas of management. Prerequisite: MBA 632, or permission of instructor. 3 hours.

641. **Macroeconomic Analysis and Decision Making**. Macroeconomic analysis; modern theory of aggregate demand and supply; forecasting and link between business firm and microenvironment. Prerequisites: 660. 3 hours.

645. **Game Theory in Industrial Organization**. Introduces students to the logic of game theory, in the context of selected topics in the theory of industrial organization. Emphasis will be on applying game-theoretic logic to generic business issues, studied as cases. Prerequisite: MBA 640. 3 hours.

654. **International Marketing**. Examination of international marketing activities, including environmental issues, marketing strategy, and tactical considerations in entering foreign markets. Prerequisite: MBA 650. 3 hours.

667. **Quantitative Methods for Finance**. Involves quantitative reasoning and management science methodology, but focuses specifically in finance issues, not business processes in general. Prerequisite: 660. 3 hours.

669. **Foundations of Total Quality Management**. Reviews essential elements of TQM and emphasizes their interrelatedness. What thought processes of management must be changed, why, and how is discussed with application to manufacturing and service sectors. Prerequisites: MBA 660, which may be taken concurrently, or permission of instructor. 3 hours.

671. **Health Care Marketing**. Introductory survey of marketing concepts as applied to health services organizations. Consumer behavior, market segmentation, target marketing, marketing research, management, and control of marketing mix variables. 3 hours.

MBA 673. **Tech Venture Business Planning**. The business plan is the DNA or genetic map of a technology venture. It is the foundation for the capital raise, as well as the roadmap for operational milestones. Unfortunately, most business plans focus on internal strategy rather than a comprehensive assessment of the competitive landscape. Therefore, particular attention will be paid to market research and competitive analysis. 3 hours.

674. **Services Marketing**. An examination of the generic differences between goods and services, with appropriate marketing strategies for services developed. Prerequisite: MBA 650. 3 hours.

675. **Seminar in E-Commerce**. Introduction to E-Commerce business-to-consumer and business-to-business activities. Prerequisite: MBA 650. 3 hours.

676. **Management Internship**. Provides students the opportunity to gain first-hand experience in local businesses for one term while receiving academic credit. Prerequisites: MBA 632, 650 or equivalent and permission of the instructor. 3 hours.

681. **From Idea to IPO**. This course is specifically designed to give graduate students in business, medicine, and engineering a deeper understanding of the issues involved in determining how to take the right idea from the laboratory to the marketplace.

682. **The Art of the Deal: Negotiating Technology Agreements**. This course takes an in-depth look at various negotiating strategies and addresses issues such as when to sell or when to license.

690. **Directed Study (Nonthesis)**. Prerequisite: Approval of Graduate School of Management. 3 hours.

Graduate students may choose only two courses (6 hours) from the following list of 500-level electives or, if an undergraduate accounting major, from the list of 500-level accounting electives.

AC 612.**Corporate Governance**.. Federal and other laws applicable to the governance, accounting, and finance activities of publicly-owned corporations, larger privately-owned corporations and other complex business organizations. (also listed as MBA 612)

AC 572. **Forensic Accounting and Information Technology Auditing**. This course is an introduction to the practice of forensic accounting and its relationship to auditing in settings characterized by extensive reliance on information technology. The course emphasizes audit methodology as applied to accounting

information systems. Prerequisite: AC 304, Accounting Information Systems. Requires approval from MAc Director.

AC 573. **Fraud Examination**. This course is an advanced fraud auditing course with a primary focus on occupational fraud and abuse—its origins, perpetration, prevention, and detection. It is the second course in the series of fraud audits and basic forensic accounting. Prerequisite: AC 472/572 or IS 472. Requires approval from MAc Director.

AC 574. **Forensic Accounting Practicum**. Students who wish to complete the forensic series are required to obtain actual work experience that applies forensic accounting concepts and methods. Prerequisite: AC 473/573; permission of the instructor; and for AC 474, senior standing, or for AC 574, graduate standing.

EC 520. **Applied Forecasting**. Practical use of various forecasting techniques on business and economic data. Topics include dynamic regression models, exponential smoothing, moving averages, seasonality, univariate Box Jenkins ARIMA modeling. Prerequisite: MBA 660. 3 hours.

LS 571. **Legal Elements of Fraud Investigation**. This course surveys key legal principles and courtroom procedures relevant to forensic accounting, and a survey of related topics—criminology theories, evidence management, and litigation services. Prerequisite: LS 246, Legal Environment of Business. Requires approval from MAc Director.

MG 518. **Quality Control**. Concepts, techniques, and organizational requirements to ensure that quality is provided to consumer. Topics include breadth of quality efforts, statistical quality control methods, quality circle principles, and quality assurance activities in various enterprises. Prerequisite: MBA 633. 3 hours.

MG 521. **Entrepreneurship**. Analytical and critical examination of functions and environments where new organizational development takes place. Role of entrepreneurship in creation and development of new economic entities. Prerequisite: MBA 632. 3 hours.

MK 520. **Sales Management**. Management of personal selling function. Nature of selling task; recruiting, selecting, training, compensating, and evaluating sales personnel. Prerequisite: MBA 650. 3 hours.

MK 540. **Small Business Consulting and Research**. Applied field work integrating all of the functional business fields. Prerequisites: MBA 632, MBA 650, and permission of instructor. 3 hours.

Dentistry (M.S.)

Degree Offered:	M.S.
Director, Dentistry:	Dr. Amjad Javed
Phone:	(205) 996-5124
E-mail:	javeda@uab.edu
Web site:	www.dental.uab.edu

Faculty

Ramzi Abou-Arraj, Assistant Professor (Periodontics); Periodontal regeneration and Implant dentistry, Esthetic soft tissue reconstruction, Periodontal-systemic conditions interrelationships.

Ruth Aponte-Wesson, Assistant Professor (Prosthodontics); Biomechanical and clinical behavior of dental implants

Anton Borovjagin, Instructor (Periodontics); Adenoviral vectors for gene therapy applications. Transductional re-targeting of adenoviral vectors to cancer cells.

James Broome, Professor (Prosthodontics); Polymers, Adhesives, Physical and Mechanical Testing, Clinical Research

John O. Burgess, Professor (Prosthodontics); Clinical trials, Caries models, Dental materials

Deniz Cakir, Assistant Professor (Prosthodontics); Mechanical and physical properties of dental materials, Dental material behavior in simulated oral environment, dental composites, dental polymers

Rama Kiran Chavali, Assistant Professor (Prosthodontics); Clinical research in endosseous dental implants

Haiyan Chen, Instructor (Oral Maxillofacial Surgery); Transcriptional control of bone cell differentiation and bone repair.

Noel K. Childers, Professor (Pediatric Dentistry); Streptococcus mutants, Dental caries, Oral immunization, Liposomes

John M. Coke, Professor (General Dental Sciences): Oral Medicine, Clinical Pharmacology, Hospital Dentistry

Allen Conan Davis, Associate Professor (General Dental Sciences); Oral health literacy and prevention, Access to care, Public health and community focused oral health activities

Patricia DeVilliers, Assistant Professor (General Dental Sciences); Sonic hedgehog pathway in craniofacial tumors, Clinical study of vesiculobullous diseases

Paul Eleazer, Professor (Endodontics): Microbiology of waterlines, Microbiology of endontic anaerobic pathogens

Heidi Erlandsen, Instructor (Periodontics): Protein crystallography, molecular mechanisms of cell signaling, metabolic disease

Andre Ferreira, Assistant Professor (Orthodontics); Temporary anchorage, self ligation

Steven J. Filler, Professor (General Dental Sciences); Medically compromised patients, Oral microbiology

Kohtaro Fujihashi, Professor (Pediatric Dentistry); Mucosal immunity, Molecular pathogenesis, Periodontal disease, Alpha and Beta T cells and epithelial cells

Maria Geisinger, Assistant Professor (Periodontics); Regenerative techniques/materials, Periodontal-systemic interrelationships, optimizing periodontal esthetics

Nicolaas Geurs, Professor (Periodontics); Clinical periodontal research, Pharmacotherapeutics, Periodontal regeneration, Diagnostic systems, Periodontal disease and systemic effects Implant research, Implant healing, Early loading of implants, Site preparation, Bone grafting procedures

Gregg H. Gilbert, Professor (General Dental Sciences); Oral Epidemiology, Dental Health Services

Daniel Givan, Associate Professor (Prosthodontics and Biomaterials); Composite, Resin, Wear, Fatigue

Mohammad Hassan, Assistant Professor (Oral and Maxillofacial Surgery); Molecular function of non-coding RNA, transcription factor and epigenetic regulation of osteoblast differentiation

Timothy Heaven, Associate Professor (General Dental Sciences); Dental digital imaging, Use of computer in digital imaging analysis

Yung-Tsung Hsu, Associate Professor (General Dental Sciences); Dental implants, Complete denture, Overdenture, Dental attachment

Janice Jackson, Associate Professor (Pediatric Dentistry): Clinical pediatric dentistry, pulp therapy, childhood caries, childhood obesity

Alexander Jacobson, Professor Emeritus (Orthodontics); Cephalometric Evaluation of Orthognathic Surgery and Skeletal Open Bite Cases

Amjad Javed, Professor (Oral and Maxillofacial Surgery); Bone, teeth, cartilage development and remodeling, Adipogenesis, Gene knock-out models, Transcriptional regulation of skeletal cell differentiation.

Peter Jezewski, Assistant Professor (Periodontics); Inherited component of craniofacial disorders, syndromic clefting disorders, periodontitis, zebrafish model

Donald T. Karaki, Assistant professor (General Dental Sciences); Oral Medicine, Oral Radiology, Implants, Diabetes, Head and Neck Oncology

Jannet Katz, Professor (Pediatric Dentistry); Periodontal Disease, Porphyromonas gingivalis, Hag B, T-Helper Cells, Immune Response, Cytokines

Chung H. Kau, Professor (Orthodontics); Three dimensional facial imaging and modeling

Keith Kinderknecht, Professor (Prosthodontics); Axiography, mandibular movement, temporomandibular disorders

Jack E. Lemons, Professor (Prosthodontics); Biocompatibility of synthetic materials, Alloys and casting technology, Biomechanics

Mark Litaker, Associate Professor (General Dental Sciences): Dental epidemiology, Research methods, Biostatistics

Perng-Ru Liu, Professor (Prosthodontics); Dental CAD-CAM, Esthetic, Dental implant restorations

Patrick J. Louis, Professor (Oral and Maxillofacial Surgery); Maxillofacial reconstruction, Dental implantology, Dentoalveolar surgery, Temporomandibular joint therapy

Mary McDougall, Professor (Oral and Maxillofacial Surgery): Genetic dental diseases, tooth development, mineralized matrix, gene regulation

Sonia K. Makhija, Assistant Professor (General Dental Sciences); Early Occlusal Caries, Geriatric Dentistry, Preventive Dentistry, Evidence-Based Dentistry

Raquel Mazer-Gurmendi, Associate Professor (General Dental Sciences); Dental Materials, Composite Resins, Adhesives, Clinical investigation, Physical and mechanical testing

Michael McCraken, Professor (General Dental Sciences); Dental implants, Biomimetic materials, Growth factors

Lillian Mitchell, Assistant Professor (General Dental Sciences); Dental implants and implant prostheses, Cad-Cam all ceramic restorations

Steven C. Mitchell, Assistant Professor (Pediatric Dentistry); Early childhood caries, Technology, Education

Leonard A. Mueninghoff, Professor (Prosthodontics); Implants, Biomaterials, Microleakage, Adhesives, Veneering, Composites

Dobrawa Napierala, Assistant Professor (Oral Maxillofacial Surgery): Trps1 transcription factor and molecular networks during formation and homeostasis of mineralizing tissues

Kent G. Palcanis, Professor Emeritus (Periodontics); Clinical Periodontology, Control of periodontal disease

Firoz Rahemtulla, Professor Emeritus (Prosthodontics); Connective tissue biochemistry, Oxidants and antioxidant enzymes, Salivary proteins, Peroxidases

Lance Ramp, Assistant Professor (General Dental Sciences); Wear and degradation of dental materials

Merrie H. Ramp, Associate Professor (General Dental Sciences); Dental materials testing

Michael Reddy, Professor (Periodontics); Periodontal disease progression, Implants, Periodontal therapeutics

P. Lionel Sadowsky, Professor Emeritus (Orthodontics); Temporomandibular joint dysfunction, Growth and treatment, Surgical Orthodontics, Bonding

Somasak Sittitavornwong, Assistant Professor (Oral Maxillofacial Surgery): Obstructive sleep apnea, airway, fluid dynamics

Nada M. Souccar, Assistant Professor (Orthodontics); Craniofacial growth, development and aging; three dimensional imaging, biology of tooth movement.

Ken Tilashalski, Associate Professor (General Dental Sciences): Smokeless tobacco, Smoking cessation, Mucocutaneous diseases, Endodontic treatment outcomes

Joe P. Thomas, Adjunct Professor (Endodontics); Clinical Caries Investigation, Sickle Cell Anemia

John B. Thornton, Jr., Professor (Pediatric Dentistry); Incidence of Periodontal Disease in the Mentally Retarded, Dental Health of Aging and Elderly Persons with Mental Retardation

Christos C. Vlachos, Clinical Associate Professor (Orthodontics); Occlusion, Orthodontics, Temporomandibular dysfunction

Peter D. Waite, Professor (Oral and Maxillofacial Surgery); Orthognathic deformities, Cosmetic facial surgery, Facial reconstruction, Cleft lip and craniofacial disorders, Obstructive sleep apnea

Thomas W. Weatherford, III, Professor (Periodontics); Chemotherapy of plaque, Clinical trials in Periodontal diseases

Richard Weems, Associate Professor (General Dental Sciences); Dental radiology, Digital radiographic imaging, Diagnostic decision support software

Hui Wu, Associate Professor (Pediatric Dentistry); Biofilm, adhesin, glycosylation, secretion, bacterial pathogenesis

Ping Zhang, Assistant Professor (Pediatric Dentistry); Immunology, inflammation, periodontitis

Program Information

Advanced clinical specialty training and research, leading to the degree of Master of Science in Dentistry, is offered to meet two areas of need: the preparation of qualified teachers and investigators in the various branches of academic dentistry and the preparation of fully trained dental specialists. The program is a combination of the conventional work for the M.S. degree plus the achievement of proficiency in some phase of clinical dentistry. The course of study requires a minimum of two academic years; most students will require three years to complete the work. The applicant must be a graduate of an accredited school of dentistry and must have achieved, in both predental and dental requirements, a superior scholastic record.

At the time of enrollment in the Graduate School, the student is assigned an appropriate faculty advisor, who works with the student in outlining a course of study consistent with objectives. This curriculum must cover the three areas of a selected phase of clinical dentistry, a related basic health science, and research.

Major and Minor

The major field of study must be selected from the following: dental biomaterials, endodontics, general dentistry, hospital dentistry, maxillofacial prosthetics, oral surgery, orthodontics, pediatric dentistry, periodontics, prosthodontics, public health dentistry, or dental radiology. Not less than 18 semester hours of credit in the program must be in the major subject, with the minimum acceptable grade being B. A minor must involve at least six semester hours of study in one or two basic health science departments related to the student's major and research interests.

By the time the student has been in residence one year and has finished some of both major and minor courses, the student and the advisor should recommend to the Graduate School dean at least two additional graduate faculty members, one from the minor area, for appointment to the graduate study committee. The student should discuss with this committee plans for the remaining course of study, including a proposed thesis title and outline of experimental design. Depending upon the nature of the research plan, it may be desirable for a different advisor to be appointed, serving either as co-chair or as new chair of the graduate study committee. At this time, demonstration of a reading knowledge of one foreign language, competence in biostatistics, experience with computer techniques, or other tools of research may be required, as appropriate to the student's investigation.

Admission to Candidacy

When the graduate study committee is satisfied that the student is prepared to undertake the research, the student is admitted to candidacy for the master's degree. This step should be taken at least three semesters before the anticipated date of completion of the program.

Research and Thesis

Sufficient research work to train the candidate in the principles and methods of scientific investigation is required. The research project should involve the student's own intensive work in some area of dentistry, preferably related to the basic health sciences. The thesis is based on the research study and must show the candidate's ability to delineate a problem, plan its solution, and present the results of the work in an orderly fashion. Familiarity with the literature of the field is expected.

Final Examination

The final oral examination is administered by the student's graduate study committee before the deadline is set by the Graduate School. The examination begins with oral presentation and defense of the thesis and may include any work fundamental thereto. At the close of the examination, the committee votes on the candidate, taking into account all of the work undertaken. Majority approval is required.

Additional Information

Deadline for Entry Term(s):	Consult Program Director for information
Deadline for All Application Materials to be in the Graduate School Office:	Variable
Number of Evaluation Forms Required:	Three
Entrance Tests	DDS (TOEFL and TWE also required for international applicants whose native language is not English.)

Contact Information

For detailed information, contact the graduate program director, Dr. Amjad Javed, University of Alabama School of Dentistry, School of Dentistry Building, SDB 714, 1919 Seventh Avenue South, Birmingham, AL 35294-0007.

Telephone 205-934-5407

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E-mail **javeda@uab.edu**

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Master of Science with Emphasis in Oral Biology

The School of Dentistry in collaboration with the joint basic science Departments at The University of Alabama School of Dentistry offers graduate studies leading to a Master of Science degree with emphasis in Oral Biology. The objective of the program is to relate basic biological sciences to health and disease of the oral cavity. This program is designed for individuals holding a D.D.S., D.M.D., or B.S. in Science (e.g. biology, chemistry etc) with little or no experience in basic research. This program will provide insight into dental academics and teaching in basic or applied research.

Students are required to pursue studies in oral biology and in the basic biological sciences. These studies include course work, seminars, journal club, and a laboratory component. Course work includes formal lectures from within the School of Dentistry and courses offered by the basic sciences departments, School of Public Health and the School of Medicine. The seminars include the “Dean’s Seminar Series” and the Institute of Oral Health Research seminars. The Seminars cover a wide array of topics relevant to various research areas as well as other disciplines of dentistry or dental education. A significant portion of the program is devoted to the design and completion of a thesis research project in the form of one publishable paper in a reputable scientific journal which is a requirement of the program. Thesis research will be carried out under the supervision of a faculty member. Faculty involved in the Master of Science program with emphasis in Oral Biology are actively engaged in research that represents a variety of oral and basic biomedical disciplines within the UAB. The diversity of the research interests offers opportunities for students to pursue studies in a stimulating research environment.

The program requires a **minimum of 30 graduate credits**. Of these, at least 24 credits must be selected from graduate-level courses approved for the program and a minimum of 6 credits at the master's research level. Each student must orally defend a master's thesis based on their research. If the applicant holds a D.D.S. or D.M.D. degree, the Master in Science may be combined with a clinical dental specialty training only after acceptance into the clinical program.

Admission

Applicants must hold a B.S., D.D.S., or D.M.D., or an equivalent degree and should possess a cumulative grade-point average of at least 3.00 on a 4.00 scale. Standardized test such as GRE or DAT is required for all applicants. Students whose first language is not English must earn a score of 560 or better on the Test of English as a Foreign Language (TOEFL).

Applicants are asked to submit a statement describing past research experience and current research interests, and stating how completion of the Master in Science program fits into their career goals.

For International applicant; transcripts and all related material should be received no later than **February 28** to enroll in the fall semester of the same year.
For US applicants; transcripts and all related material should be received no later than **March 31** to enroll in the fall semester of the same year.

Financial assistance is not available. Students must show that they can support themselves.

Contact

For further information and application materials, contact:

Jannet Katz, DDS, PhD
Professor
Department of Pediatric Dentistry
University of Alabama School of Dentistry
BBRB 713
1530 3rd Avenue South
Birmingham, AL 35294-2170
Telephone: (205) 934-2878
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Course Descriptions

Clinical Dentistry (CD)

Course credits in semester hours are to be arranged by consultation with the chair of the department involved. In general, courses in clinical dentistry may be expected to carry 3-6 hours of credit per semester. Course numbers marked with an asterisk indicate courses that may be repeated for credit.

*601. **Advanced Topics in Endodontics Seminar I.** Correlation of basic science and endodontics by literature review, lectures, seminars, demonstrations, presentations, and patient clinical treatments. Prerequisite: Permission of instructor. 3-6 hours.

*602. **Special Topics in General Dentistry**. 3-6 hours.

*603. **Special Topics in Oral and Maxillofacial Surgery**. Unique areas of surgical treatment in oral and maxillofacial surgery; orthognathic, TMJ, and facial reconstruction. 1-12 hours.

*604. **Special Topics in Orthodontics**. Diagnosis and treatment of orthodontic malocclusion in children, adolescents, and adults. 3-6 hours.

*605. **Special Topics in Pediatric Dentistry**. Areas affecting practice of pediatric dentistry, such as developing malocclusions, and their early diagnosis and management. 1-6 hours.

*606. **Special Topics in Periodontics**. Review of basic sciences and periodontics by special readings, lectures, seminars, and clinical instruction. Patient evaluation, treatment, planning, and therapeutic skills. 3-6 hours.

*607. **Removable Prosthodontics Seminar**. Current treatment modalities.

*608. **Special Topics in Radiology**. Lectures, seminars, and clinical instruction regarding intraoral and extraoral radiographic examinations. Technical and interpretation facets. 1-6 hours.

*609. **Special Topics in Fixed Prosthodontics**. Gnathological concepts and implantology.

610. **Introduction to Medical Genetics**. 3-6 hours.

*611. **Special Topics in Maxillofacial Prosthetics**. Application of biologic knowledge to planning treatment for restoration and reconstruction of special maxillofacial prosthetic patient. 1-3 hours.

*612. **Advanced Prosthodontics**. First-year clinic. Laboratory and clinical diagnosis, treatment planning, and care delivery, including implantology.

*613. **Special Topics in Hospital Dentistry**. Hospital protocol and procedures, medical emergencies in dental office, infection control, treating the medically compromised patient. 1-6 hours.

*614. **Periodontal Case Conferences**. 1-3 hours.

*615. **Periodontal Literature Review Seminar**. 1-3 hours.

*616. **Periodontal Board Topics**. 1-3 hours.

*620. **Clinical Pediatric Dentistry I.** 3-6 hours.

625. **Design and Analysis in Clinical Dental Research**. Basic statistical concepts, including terminology and appropriateness of study design and statistical tests. 1-4 hours.

626. **Surgical Implants in Dentistry**. Materials used for dental implants, design, fabrication, and tissue response to implants. 3-6 hours.

*627. **Biocompatibility Testing and Biodegradation Phenomena**. Degradation of materials in body, effect of ion release to tissues, tests for biocompatibility.

*628. **Enamel Properties, Acid Etching, and Adhesion**. Properties of enamel and dentin, acid-etching techniques, principles of adhesion, dentin bonding agents. 4 hours.

*629. **Ceramic Materials in Dentistry**. Basic science of ceramic materials, porcelain, cements, gypsum, investments, and ceramic implant materials.

*630. **Clinical Biomaterials Research Methods**. Design of studies for clinical evaluation of biomaterials, clinical test methods, and correlation of laboratory results.

*631. **Polymeric Biomaterials**. Basic science of polymers, acrylics, waxes, composite resins, impression materials, and polymeric implant materials.

*632. **Seminar in Biomaterials**. Review of biomaterials literature. 1 hour.

*633. **Alloy Systems in Dentistry**. Basic science of metals, mobile and base metals and alloys, amalgam, metallic implants.

*634. **Craniofacial Genetics**. Craniofacial findings in children with genetic disorders; dental features and other physical abnormalities associated with such disorders.

*635. **Pediatric Dentistry Journal Club**. 2 hours.

*636. **Hospital Dentistry**. Aspects of general anesthesia for pediatric and handicapped patients, including laboratory tests, indications for general anesthesia, etc. 2 hours.

*637. **Growth and Development-Genetics**. Mechanisms and control of craniofacial growth, both normal and aberrant; background in genetics.

638. **Current Topics In Dentistry**. Fixed and removable prosthetics, restorative techniques, endodontics, periodontics, practice management. 1 hour.

639. **Dental Management of the Medically Compromised Patient**. Treatment modifications for the medically compromised patient; heart disease, diabetes, renal disease, organ transplantation, antibiotic protocols. Summer.

*640. **Physical Diagnosis**. Basic principles of physical examination.

*650. **Advanced Topics in Hospital Dentistry**. Dealing with medically complex patient; anesthesia and sedation techniques; dental care of hospitalized patient. 1-6 hours.

651. **Advanced Topics in Endodontics Seminar II**. Readings, lectures, seminars, and clinical instruction in surgical therapies, trauma, and resorption of roots; fundamental research techniques. Prerequisite: CD 601. 3-6 hours.

*652. **Advanced Topics in General Dentistry**. 3-6 hours.

*653. **Advanced Topics in Oral and Maxillofacial Surgery**. 3-6 hours.

*654. **Advanced Topics in Orthodontics**. Diagnosis and treatment planning of complex orthodontic malocclusions including orthognathic surgical problems, craniofacial malformations, and temporomandibular joint dysfunction. This includes didactic and clinical programs. 3-6 hours.

*655. **Advanced Topics in Pediatric Dentistry**. Individually selected topics researched and presented in manuscript form at end of semester. 1-6 hours.

*656. **Advanced Topics in Periodontics**. Special readings, seminars, lectures, and clinical instruction in advanced clinical procedures and clinical research techniques. Prerequisite: CD 606. 3-6 hours.

*657. **Advanced Clinical Prosthodontics**. (Continuation of CD 612). Emphasis on full-mouth rehabilitation and implantology. Prerequisite: CD 612.

*658. **Advanced Topics in Radiology**. Advanced imaging systems; radiographic procedures. 1-12 hours.

*659. **Advanced Topics in Fixed Prosthodontics**. Total patient care; emphasis on implantology and rehabilitation. Prerequisite: CD 609.

*660. **Advanced Topics in Maxillofacial Prosthetics**. Principles of maxillofacial prosthetics; technical procedures and material; mechanical testing and laboratory evaluation of materials.

*661. **Physical Properties of Biomaterials**. Physical and chemical properties of metallic, ceramic, and polymeric materials; mechanical testing and laboratory evaluation of materials.

*662. **Laboratory Methods for Biomaterials Research**. Dental casting methods, metallography, hardness and mechanical properties testing, corrosion and surface testing, design of laboratory and clinical experiments, photography, use of light and scanning electron microscopes.

*663. **Diagnosis and Screening Procedures in Dentistry**.

*664. **Grand Rounds in Pediatric Dentistry**. 2-3 hours.

665. **Maxillofacial Seminar**.

*666. **Clinical Maxillofacial Prosthetics**. Prosthetic rehabilitation of patients with deficient maxillofacial system. 1-3 hours.

667. **Selected Topics in Anatomy of Head and Neck**.

*668. **Advanced Oral Histopathology**.

*669. **Clinical Pediatric Dentistry II**.

*670. **Microcomputer Applications in Dental Research, Public Health Dentistry, and Clinical Dentistry**. Use of microcomputers, different types of software; application to specific research, clinical, public health, and practice management procedures.

*671. **Special Topics in Microcomputer**.

*672. **Advanced Topics in OMS**. 5 hours.

*673. **Special Topics in OMS Trauma**. 4 hours.

*674. **Advanced Topics in OMS-Orthognathic**. 4 hours.

*675. **Special Topics in OMS Patient Care**. 4 hours.

*676. **Advanced Topics in OMS Oral Pathology**. 4 hours.

*679. **Fundamentals of Pediatric Dentistry**. Topics include operative dentistry, physical therapy, preventive orthodontics. 1-6 hours.

*680. **Dental Clinical Pathology**.

*681. **Clinical Pediatric Dentistry III**.

*682. **Special Topics in Endodontics**.

*685. **Advanced Endodontics**. First-Year Clinic.

*686. **Advanced Endodontics**. Second-Year Clinic.

*688. **Special Pathology**.

*689. **Conscious Sedation**.

*690. **Physiology and Concepts of Occlusion**.

*691. **Special Topics in Biomaterials Science**. 1-6 hours.

*692. **Advanced Prostodontic Seminar**. Correct and historical prostodontic literature.

*693. **Special Topics in OMS**. 5 hours.

*694. **Advanced General Dentistry Seminars (I-IV)**. Diagnosis, treatment planning and case management; patient and practice management; quality assurance; instruction and advanced clinical procedures; comprehensive case presentations. 1 hour.

*695. **Literature Review in Pediatric Dentistry**.

*698. **Nonthesis Research**. 1-6 hours.

*699. **Thesis Research**. Prerequisite: Admission to candidacy. 1-6 hours.

Oral Biology (OB)

Unless otherwise noted, all courses are for 3 semester hours of credit.

600. **Graduate Cariology**. Comprehensive survey of the state of the science in the management, etiology and prevention of dental caries from an infectious disease perspective. Modern methods in molecular epidemiology and molecular biology are integral to the course. Winter.

602. **Pharmacology and Therapeutics for Dentistry**. Current knowledge in pharmacological issues related to dentistry. Spring.

603. **Oral Inflammation and Periodontal Disease**. Understanding the immunological aspects of periodontal disease. Winter

607. **Prenatal craniofacial growth and Development**

608. **Special Topics in Oral Biology**

611. **Saliva: Composition and Function.** Physiology, biochemistry, and function of saliva in relation to oral health and as a diagnostic fluid. Spring.

616. **Postgraduate Oral Histology**.

620. **Oral Microbiology and Immunology.** Microbiological and molecular aspects of infectious diseases that impact the oral cavity including dental caries, periodontal disease, hepatitis, AIDS and various oral infections. Winter.

622. **Biochemistry of Connective Tissue and Bone.** Biology, chemistry and function of bone and other connective tissue elements. Methods and approaches to research. Fall.

625. **Current Issues in Nutrition and Oral Health**.

627. **Surgical Implants in Dentistry.** Basic aspects of dental implant-based treatment modalities. Spring**.**

630. **Introduction to Clinical Trials/Epidemiology**.

631. **Ethics in Biological Research**.

632. **Special Topics on Mucosal Immunology**.

633. **Research Design Methodology**.

657. **Prenatal Craniofacial Growth and Development**.

663. **Saliva as a Diagnostic Fluid**. Comprehensive knowledge about planning, performing, and interpreting results of saliva analyses. Fall

687. **Oral Immunobiology and Vaccine Development**. Comprehensive knowledge of immune responses and "state of the art" mucosal vaccine development and their protection of oral/mucosal infectious diseases.

721. **Oral & Skeletal Biology Journal Club**. Genetic, developmental and molecular aspects of the oral cavity and bone. 2-credit hours.

698. **Non-Thesis Research**.

699. **Thesis Research**. Prerequisite: Admission to candidacy.

DMD/PhD Program

Degree Offered:	DMD/PhD
Director:	Dr. Steve Filler
Phone:	(205) 934-3387
E-mail:	**admissions@cs1.dental.uab.edu**
Web site:	**http://www.dental.uab.edu/research/training-**

programs/dmdphd-program1.html

DMD/PhD Program

The UAB School of Dentistry DMD/PhD program prepares students for an exciting career in dental academics through an innovative integrated clinician scientist training program. Students in the program are allowed to apply credits earned in both dental and graduate school towards a specialized program earning both a DMD degree and a PhD degree in a biomedical science.

Applicants interested in the DMD/PhD program must have completed an undergraduate degree program (BA or BS) that fulfills all requirements for both dental school and graduate school admissions. Students need to directly contact Dr. Steve Filler, Director of Admissions, UAB-School of Dentistry at 205.934.3387 or by email at **admissions@cs1.dental.uab.ed** . Separate applications are submitted to the UAB School of Dentistry and the UAB Graduate School (1530 3rd Avenue South, HUC 511, Birmingham, AL 35294-1150). UAB School of Dentistry participates in the American Association of Dental Schools Application Service (AADSAS). Students should initiate AADSAS applications as early as possible. Applications received by AADSAS after November 1 can cause a delay in the admission process.

All Alabama applicants and those out-of-state residents, whose AADSAS applications indicate they can be given serious consideration, will be requested to file a supplemental DMD/PhD application. This form requests additional information that is not part of the AADSAS material and includes a photograph, a one page assay on the interest of the candidate in a dental academic research career, a pre-dental advisory committee evaluation if available, and three letters of recommendation from professors related to the applicant's interest in research or major field of study. A non-refundable $75 fee is required to file this supplemental application. This supplemental application, along with all transcripts, letters of recommendation and other specified documents, should be received by the School of Dentistry Admissions Office no later than December 1 for the upcoming year for which admission is sought.

Applicants whose credentials indicate they may qualify for admission will be invited for a personal interview with the Admissions Committee. Candidates will be evaluated based on their academic record, DAT scores, research accomplishments, commitment to a research career, character, and personality traits indicating potential for success in a DMD/PhD program. An acceptable interview makes the student eligible for participation in the program and for admission to the School of Dentistry DMD/PhD program.

To be accepted into the program, applicants must:

1) Contact Dr. Steve Filler at UAB School of Dentistry indicating intent to apply for the DMD/PhD program.
2) Submit a formal application to the UAB School of Dentistry through AADSAS.
3) Submit a formal application to the UAB Graduate School through the integrated program General

Biomedical Sciences or an individual participating department e.g., Microbiology, Pathology, etc.)

4) Have successfully taken the Dental Aptitude Test (DAT).

5) Have completed all the recommended courses for both dental and graduate school admissions.

Sequence of the DMD/PhD Program:

1) Completion of at least two years of graduate school coursework and requirements including graduate school qualification examinations and dissertation proposal defense maintaining a cumulative GPA of at least a **3.0**

2) Receive a positive recommendation for transition into the dental school's curriculum by the DMD/PhD Advisory Committee

Important Points:

1) Generally it is anticipated that the DMD and PhD degrees will be awarded within the same year upon completion of all dental and graduate school requirements

2) Duration of the program is expected to be 7.0 years; however students with strong prior research experience have completed the program in 6 years.

3) If a student is accepted into the DMD/PhD program and chooses not to complete the PhD training program, they will be required to re-apply to the School of Dentistry for admission as a traditional DMD candidate.

Financial Support Opportunities:

Students enrolled in the DMD/PhD training program are eligible for funding through an individual NIDCR supported F-30 Training Award. Detailed information about the F-30 grant application is available at **http://grants.nih.gov/grants/guide/pa-files/PAR-08-119.html** The F30 grant program provides an annual student stipend of $25,000 per year (as of July 2010), a percentage of total tuition costs (60% of the allowable costs), health and dental insurance, and scientific meeting travel funds ($800).

DMD/PhD Career Opportunities:

Upon completion of the DMD/PhD program students may be qualified for additional post-doctoral training related to their research interests as well as a dental specialty program. Successful completion of the DMD/PhD program and post-graduate training could make the student a viable candidate for a faculty position in academic dentistry. The National Institute of Craniofacial and Dental Research (NIDCR) sponsors a number of institutional or individual grant award programs to provide funding for these types of additional training. Information about these programs can be found on the NIDCR webpage at **http://www.nidcr.nih.gov/Funding/FundingMechanisms/default.htm**

Education: General Information

General Information

UAB's programs in education are fully approved by and the National Council for Accreditation of Teacher Education. Teacher certification programs within the School of Education have been approved by the Alabama State Board of Education. There are 13 graduate majors in the area of education; these are described in sections arranged alphabetically following this general information section.

Degrees and Certificates

Degrees are awarded by UAB in recognition of scholastic achievement and may be pursued for their own sake. However, employment in the public schools is governed not by the degree but by the professional certificate issued by the Alabama State Department of Education (ALSDE). Since many students in these programs are preparing for work in the public schools, the pursuit of a degree is usually coupled with pursuit of SDE certification. There is a rough correspondence between degree level and certification class, as follows:

Degree Level	*Certification Class*
Bachelor's	B
Master's	A
Specialist (post-master's)	AA
Doctoral	No Equivalent

In spite of this correspondence, we emphasize that the admission and completion requirements for the degree and for the certificate are often significantly different. Furthermore, not all education students are pursuing SDE certification. Students seeking certification should verify requirements with an advisor or program director. State regulations governing certification change often; therefore, it is incumbent upon the student to seek advisement each term. Students should not register for any coursework without having first met with an advisor.

Education: Curriculum and Instruction

Chair: Dr. Lynn Kirkland

Phone: (205) 934-8358

E-mail: lkirk@uab.edu

Web site: http://www.ed.uab.edu/

Degrees offered:
Education, Early Childhood (Ph.D., Ed.S., M.A.Ed.)
Education, Elementary (Ed.S., M.A.Ed.)
Education, High School (Ed.S., M.A.Ed.)
Art Education (M.A.Ed.)
Music Education (M.A.Ed.)
English as a Second Language (M.A.Ed.)
Reading (M.A.Ed.)

Faculty

Carol Allison, Instructor (Special Education); Visual Impairments

Joseph C. Burns, Associate Professor (Elementary and High School Education); Biology, Science Education

Charles Calhoun, Associate Professor (Elementary Education); Elementary Math Education, Curriculum and Instruction

Lois M. Christensen, Professor (Elementary Education); Elementary Social Studies, Qualitative Research Methodology, Elementary Preservice Teacher Education, Ethnographic Processes, Study of Diversity, Women, and International Topics

Jeremiah Clabough, Assistant Professor, (Secondary Education) Social Sciences

Karen Dahle, Associate Professor (Special Education); Special Education Administration and Supervision, School Psychology, Autism, Counseling

Ann Dominick, Assistant Professor (Early Childhood Education)

Kay Emfinger, Associate Professor (Early Childhood Education); Early Childhood Development, Curriculum Development, Curriculum Theory

James Ernest, Associate Professor (Early Childhood Education); Early Intervention and Early Childhood Special Education

Debbie Fly, Instructor (Elementary Education)

Richard M. Gargiulo, Professor (Special Education); Conceptual Development of Mild Disabilities, Teacher Education

Renitta Goldman, Professor (Special Education); Learning and Behavioral Handicaps; Assessment; Physical, Emotional and Sexual Abuse; Suicide Among Minority Populations

Grace Jepkemboi-Kibirgen, Assistant Professor (Early Childhood Education) Early Childhood Development, Early Childhood Curriculum

Constance Kamii, Professor (Early Childhood Education); Early Childhood Education and Theory of Jean Piaget

Jennifer Kilgo, Professor (Special Education); Early Childhood

Lynn Kirkland, Professor (Early Childhood Education); Early Childhood Development, Early Childhood Curriculum

Maryann M. Manning, Professor Emerita (Elementary Education); Reading and Language Arts, Individualization of Instruction, Creative Teaching

Kathleen Martin, Associate Professor Emerita (Early Childhood Education); Reading, Child Development, Reading Recovery

Lee Meadows, Associate Professor (High School Education); Science Education, Multicultural Issues, K-14 Science

Betty Nelson, Associate Professor (Special Education); Low-Incidence and High-Incidence Disabilities, Assistive Technology, Collaboration in Schools

Sherry Parrish, Assistant Professor, (Elementary Education)

Tonya Perry, Assistant Professor (Secondary Education); Language Arts Education

Diane Pevsner, Assistant Professor (Collaborative Teacher)

David Radford, Associate Professor (Science Education); Assessment, Professional Development

Mary Jean Sanspree, Research Professor (Special Education); Visual Impairments, Alabama Deaf-Blind Project

Katherine Scott, Instructor, (Elementary Education)

Seay, Susan, Assistant Professor (ESL) Second Language Acquisition

Kristi Shaw-Saleh, Assistant Professor (ESL) Second Language Acquisition, ESL methods for teaching adult learners

Michele Sims, Associate Professor (High School Education); Reading, Middle School Education

Tommy G. Smith, Associate Professor (High School Education); Mathematics Education

Susan Spezzini, Assistant Professor (English Language Learner Education); Phonology for ESL Teachers, Culturally and Linguistically Responsive Instruction

Deborah Strevy, Assistant Professor (Early Childhood Education); Language Arts, Early Childhood Education

Jennifer Summerlin, Instructor, (Reading Education)

Deborah Voltz, Associate Professor (Special Education); Learning Disabilities, Urban Education

Yu-Mei Wang, Associate Professor (Technology); Technology Across Curriculum, E-teaching, Instructional Design

Lou Anne Worthington, Associate Professor (Special Education); Emotional and Behavioral Disorders, Collaborative TEaching, Special Education Law

Veronique Zimmerman-Brown, Instructor

Program Contact Information:

Program	Coordinator	Room	Phone Number
Secondary Education	Dr. Susan Spezzini	120	(205) 934-8357
English as a Second Language	Dr. Susan Spezzini	120	(205) 934-8357
Special Education	Dr. Kay Emfinger	107	(205) 934-7003
All other programs	Dr. Kay Emfinger	107	(205) 934-7003

Graduate Programs

The M.A.Ed., Ed.S., and Class AA programs emphasize improving the teaching skills of the student and broadening the student's understanding of the field(s) of teaching specialization. Numerous teaching fields are available. All prospective students must apply for admission through the Graduate School.

The M.A.Ed. program requires a minimum of 30-32 semester hours of study, and the Ed.S. and AA programs require at least an additional 32 semester hours. All programs require a written final examination or comprehensive electronic portfolio and a minimum GPA of 3.00 for master's degree and 3.25 for the Ed.S. An outline of the specific course requirements can be obtained from the office of the graduate program director or the Office of Student Services in the School of Education. The M.A.Ed. programs satisfy the academic requirements for the Alabama State Department of Education Class A Professional Certificate. The Ed.S. programs satisfy academic requirements for the State Department of Education Class AA Professional Certificate and an Ed.S. degree. See also the section "Education (General Information)" earlier in this catalog.

The program leading to the Doctor of Philosophy (Ph.D.) degree in early childhood education is sufficiently flexible to accommodate the interests and previous preparation of the student, but it must include an internship and a substantial research component culminating in the completion of a dissertation. The minimum admission requirements are those of the UAB Graduate School. However, admission is highly selective, and most successful applicants have qualifications much higher than the

minimum. Admission is open with ongoing application considerations. Application packets must be complete in the Graduate School office before the applicant can be considered for the program..

Contact Information

For detailed information, contact Dr. Kay Emfinger (Early Childhood, Elementary, Special Education), or, Dr. Susan Spezzini (Secondary, Single Subject K-12 and English as a Second Language).

UAB Department of Curriculum and Instruction, EB 119, 1530 3rd Avenue South, Birmingham, Alabama 35294-1250.

Telephone 205-934-5371

Web **www.ed.uab.edu**

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

Early Childhood Education (ECE)

545. **Curriculum for Young Children**. Basic knowledge of curriculum and concepts of mathematics, science, and social studies for young children. Child growth and development as basis for planning and teaching mathematics, science, and social studies to young children. Teaching methods and use of instructional media. Practicum experience required. Prerequisite: Admission to ECE 5th-Year Program. 6 hours.

546. **Communication Arts and Reading for the Young Child**. Nature of reading and language arts experiences for children, infant through grade three. Media, materials, experiences, programs, and strategies to facilitate development of communicative abilities with emphasis on preserving and maintaining creative expression in different cultural settings. Integration of learning in areas of listening, speaking, reading, composition, literature, handwriting, spelling, and other communicative arts. Laboratory experiences required. Prerequisite: Admission to ECE 5th-Year Program. 6 hours.

548. **Infant/Toddler Development**. Study of human development within an ecological context from before birth to three years of age. Course covers social-emotional, physical, cognitive, language, and creative development of the infant and toddler in the home and also in programs for very young children.

549. **Educational Environment: Infants/Parents (Toddlers/Parents)**. Study of infant (or toddler) development as it relates to the organization of a parent/infant (or toddler) educational program.

Information concerning program management, observation of parent/infant (or toddler) interaction, development and sequencing of activities, creation and evaluation of materials, and an examination of techniques and procedures for parent involvement and education. Actual experience in working with a parent/infant (or toddler) program will be an integral part of the course. Prerequisite: ECE 548 or equivalent. 3 or 6 hours.

620. **Introduction to Curriculum and Teaching**. Basic knowledge of early childhood curriculum for programs, infant through third grade, in a variety of settings. Relationship of child growth and development in planning and implementation of all areas of curriculum. Prerequisite: Admission to ECE 5th-Year Program.

630. **Cognitive Curriculum in Early Childhood Education**. Mathematics and science for children four to eight years of age based on constructivism. Children's thinking, particularly in physical-knowledge activities, group games, and situations in daily living.

631. **Program for Young Children**. Early childhood education programs and theoretical perspectives. Existing curricula such as Piaget, behavior modification, Montessori, open classroom, foreign-based programs. Required for students without undergraduate majors in ECE.

632. **Young Children and Their Literature**. Literature for children in nursery school, kindergarten, primary grades; selection, use, and integration of literature in total curriculum.

633. **Social Development of the Young Atypical Child**. Theoretical issues and political, sociological relationship of the atypical child. Nature, assessment, and intervention of emotional disorder. Program planning, teaching, and interdisciplinary considerations.

690. **Practicum in Early Childhood Education**. Required of all M.A.Ed. students. Prerequisite: Permission of instructor. 3 or 6 hours.

692. **Practicum in Primary Education**. Prerequisite: Permission of advisor and department. 6 or 9 hours.

693. **Internship in Early Childhood Education**. Full-time internship for 10 weeks (300 clock hours). 3 or 9 hours.

694. **Practicum in Early Childhood Education for the Young Atypical Child**.

730. **Doctoral Seminar I: Advanced Developmental Theory.** Prerequisites: Admission to doctoral program or instructor permission.

731. **Doctoral Seminar II: Current Issues with Children in Society.** Prerequisites: Admission to doctoral program or instructor permission.

732. **Doctoral Seminar III: History of ECE.** Prerequisites: Admission to doctoral program or instructor permission.

733. **Doctoral Seminar IV. Advanced Research in Early Childhood Education**. Evaluation and planning of research in preparation for dissertation. Prerequisite: At least one course in research, measurement, or statistics. 3-9 hours.

734. **Logic and Scientific Inquiry**. Scientific investigation as applied in education. Conceptual issues in research process. Methods of analysis and presentation. Prerequisite: Master's degree.

735. **Meaning and Development of Play**. Nature of play, its importance and how it is nurtured. Prerequisite:

736. **Personality Development of the Young Child**. Theoretical perspectives; review of research, including cross-cultural studies.

737. **Parent, Child, School Interface**. Historical development of parent involvement. Theoretical bases of family-school interactions.

738. **Consultation and Coaching Processes and the Young Child.** ; Skills for working with families, teachers, and professionals in community agencies that serve infants, toddlers, and young children.

739. **Developing Interpersonal Competence for Leaders**. Relationships with coworkers and subordinates. Various approaches to interpersonal relationships. .

740. **Research Apprenticeship**. Planning, implementation, analysis, and presentation of research. 3 or 6 hours.

741. **Research Study: Design and Implementation**. Development of rationale, literature search, collection and analysis of data, and formal written report (according to APA guidelines). Must be completed before admission to candidacy.

742-745. **Piaget: Theory and Research**. Jean Piaget's theory, application to early childhood education; physical and social (conventional) knowledge. Representation and memory, logico-mathematical knowledge. Prerequisite: Master's degree and EEC 672.

746. **Contemporary Issues in American Science Education**. Crisis atmosphere surrounding science education in American classroom.

747. **Social Development of Young Children**. Factors influencing socialization of young children.

748. **Research in Infancy**. Theoretical and empirical evidence relating to psychomotor domain.

749. **Advanced Early Childhood Curriculum**. Historical, philosophical, psychological, and social thought influencing curriculum in early childhood education.

750. **Literacy Before School**. Written language development of preschool children.

751. **Schooling and Literacy Instruction**. Primary-level literacy instruction and children's literacy development.

752. **Theory and Research on Literacy Development and Instruction**. Philosophical and psychological beliefs regarding literacy development.

753. **John Dewey and the Early Childhood Curriculum**. Dewey's philosophy, epistemology; relationship to early childhood education and development.

760. **Current Issues in Infant, Toddler, and Early Childhood Education**. 3 hours.

774. **Advanced Seminar in Language Development**. Relationship of thinking and knowing to language development; strategies for analysis; strengths and weaknesses of techniques of examining language development.

790. **Internship in Early Childhood Education and Development**. 6 or 9 hours.

791. **Field Studies in Early Childhood Education**. Prerequisite: Permission of instructor. 1-6 hours.

792. **Directed Readings in Research**. Review of research in early childhood education to gain understanding of conceptual and methodological basis.

793. **Individual Research in Early Childhood Education**. Recent research in early childhood education; systematic solutions to problems in education.

794. **Current Research Topics in Early Childhood Education**. 1-3 hours. Philosophical aspects of scientific methods in education; functions of paradigms, theories, and models in inquiry; theory

development and validation; major types of experimental and nonexperimental inquiry appropriate to study of educational phenomena.

798. **Nondissertation Research**. 3-12 hours.

799. **Dissertation Research**. Prerequisite: Admission to candidacy. 3-12 hours.

Arts Education (EDA)

583. M**ethods of Teaching Art**. Learning experiences necessary for development of essential teaching competencies. Prerequisite: Admission to 5th-Year Program. 3 or 6 hours.

584. **Methods of Teaching Art Laboratory**. Required. 1 or 2 hours.

591. **Art Education Final Exhibition**. M.A. students plan and mount exhibition of work during final year. Graphic design students may prepare public portfolio presentation instead of exhibition. Art History students prepare a thesis research paper. Should be taken with the student's thesis advisor. Prerequisite: Permission of advisor.

651. **Innovative Practices in Teaching Art in the Schools**. Innovative practices in planning, instructing, and evaluating in art education. Specialized study of contemporary needs in art and art education.

680. **Art Experiences in the Teaching of Art N-12**. Concepts, methods, and skills for teaching art.

690. **Internship in Art Education N-12**. For 5th-Year Program students. Observation and student teaching in elementary and secondary schools (10 weeks or 300 clock hours). Prerequisites: Unconditional acceptance into the 5th-Year Program, completion of 9 hours in professional studies, EDA 680, and completion of 9 hours in academic courses. 9 hours.

Curriculum (EDC)

651. **Innovative Practices in Curriculum**. Current issues and special topics in curriculum; topics vary. May be repeated with different subject areas.

655. **Curriculum Principles and Practices**. Current curriculum practices; concepts and principles underlying their development.

656. **Developmental Problems and Issues in Curriculum Construction**. Includes field study of curriculum in teachers' own schools.

694. **Curriculum Seminar: Special Problems in Curriculum Development**. Prerequisite: EDC 655 or permission of instructor. 1-3 hours.

706. **The Dynamics of Educational Change**. Defining roles as change agents; understanding school as unit undergoing change; guiding perspectives in making changes. Prerequisite: Admission to graduate school.

707. **Introduction to Teacher Leadership**. Prerequisites: Master's degree and EDC 655.

711. **Analysis and Evaluation of Teaching**. Strategies and models for analysis of teaching. Use of data in evaluating teacher effectiveness. Prerequisite: Master's degree.

712. **Seminar in Curriculum and Instruction**. Critical issues and research. Development and discussion of individual research. Prerequisite: Master's degree.

713. **Educational Issues and Human Diversity**. Social, economic, and cultural forces contributing to deprivation; implications for teachers, administrators, and educational staff. Prerequisite: Master's degree.

720. **Problems and Issues in Education**. Exploration of problems and issues associated with education. Emphasis on needs of teachers and implications of the current problems and issues. Prerequisite: Master's degree.

725. **Advanced Study in Social Studies Curriculum**. Major problems and issues associated with social studies curriculum and instructional practices. Prerequisites: Completion of graduate course in teaching social studies and experience in teaching social studies.

728. **Ed.S. Research Project I**. Development of research proposal. Proposal must be accepted and approved by appointed faculty committee. Prerequisites: EPR 692 or equivalent, EPR 596 or EPR 608, and 12 hours in Ed.S. program.

729. **Ed.S. Research Project II**. Prerequisites: EPR 692, EDC 728, EPR 596 or EPR 608, and 12 hours in Ed.S. program.

731. **Curricular Design & Implementation.** Recognizing, assessing, and supporting quality instructional practices; program evaluation. School-based problem research project and field experience. 3-5 hours.

732. **Culturally and Linguistically Responsive Instruction.** Effective instruction and strategies for CLD students; outreach to CLD families. School-based problem research project and field experience. 3-5 hours.

Reading (EDR)

540. **Developmental Reading I**. Materials and methods. Emphasis on planning balanced program and understanding reading process. Includes field experiences. Prerequisite: Admission to 5th-Year Program.

4hours.

541. **Literature for Adolescents**. Literary works written for or about adolescents.

543. **Developmental Reading II: Focus on Content Areas**. Reading process as it relates to content area materials. Includes field experience. Prerequisite: Admission to 5th-Year Program. 4 hours.

551. **Reading in Content Areas**. Reading process; evaluation of content area materials; analysis of different content area textbooks; meeting individual differences.

640. **Reading Improvement Workshop**. For inservice teachers of reading. Specific content varies according to needs of teachers. 3 or 6 hours.

650. **Teaching Reading**. Understanding of reading process. Nature of reading programs; readiness motivation, methods, skills, assessment, evaluation, materials, and resources.

652. **Pre- and Early-Reading Instruction**. Theoretical bases, procedures, techniques, and materials for prereading and reading instruction. Prerequisite: Developmental reading course.

653. **Literature for Elementary and Middle Schools**. Emphasis on needs of children, selection of books, societal issues in children's literature.

654. **Assessment, Evaluation, and Correction of Reading Difficulties**. Observation, standardized oral and written reading tests, and informal reading inventories. Selecting learning activities based on diagnostic data. Prerequisite: Special Education majors only.

655. **Reading Assessment and Evaluation**. Examines evaluation techniques, such as observations, and standardized oral and silent reading tests, and informal reading inventories, such as miscue analysis.

656. **Reading Strategies for Students with Reading Difficulties**. Development and application strategies for remediating reading problems based on assessment data. Prerequisite: Diagnostic reading course.

657. **Supervision of Reading**. Supervisor's role in improving reading instruction; methods of supervision and evaluation. Prerequisite: Permission of instructor.

659. **Research and Problems in Reading**. For teachers in elementary and early childhood education.

690. **Internship in Remedial Reading**. Supervised experience with children with reading difficulties. Prerequisites: Admission to reading certification program, permission of instructor and department, and EDR 654.

691. **Practicum in Reading**. Prerequisite: Permission of instructor.

692. **Internship in Supervision of Reading**. Prerequisites: Admission to Reading Supervisor Program, EDR 654 and 657, and permission of instructor. 6 hours.

698. **Independent Nonthesis Research in Reading**. Prerequisite: Permission of instructor.

701. **Advanced Diagnosis and Remediation of Reading Problems**. Examination of serious reading disabilities; diagnosis, possible remediation strategies, and development; diagnosis, possible remediation strategies, and development of remediation plan in lab setting. Prerequisites: Master's degree and M.A.-level diagnostic reading course or permission of instructor.

702. **Reading: Theoretical Foundations**. Relates concepts of learning, development, and linguistics to reading-learning process; emphasis on current theory; implications for program planning and classroom practice. Prerequisites: EDR 650 or permission of instructor, and master's degree.

703. **Advanced Research in Reading**. Prerequisites: EDR 650 and master's degree.

704. **Field Experiences in Reading**. Supervised field experiences under direction of qualified reading consultant or supervisor in school setting. Prerequisites: Admission to Sixth-Year Program for Reading Teacher and permission of instructor. 3 or 6 hours.

705. **Seminar in Reading Instruction**. Examination of trends and issues in field of reading. topics determined by each class. Prerequisites: Master's degree and 9 graduate hours in reading or permission of instructor.

706. **Research**. Prerequisites: Master's degree and permission of instructor. 1-3 hours.

Elementary and Early Childhood Education (EEC)

500. **Pedagogy One**. Develops candidate's knowledge, skills/performance, and dispositions in the teaching of reading and language arts in the early childhood and elementary classroom. Refines abilities in instructional planning, instructional delivery, classroom management, and assessment of learners in order to address the literacy needs of diverse learners. 9 hours.

501. **Pedagogy Two**. Curriculum and field experience of P-6 curriculum in the areas of math, science, literacy, and social studies. Emphasis is placed on the scope, sequence, and content of each content area. Extensive field experiences required. 9 hours.

502. **Primary Math Methods**. Materials and methods on emergent numeracy. Field experience required. Prerequisites: Admission to 5th year program. 4 hours.

505. **Children's Literature in Elementary & Early Childhood Education**. Materials and methods. Needs of children, selection of books, societal issues in children's literature, and role of media in children's literature. Field experience required. Prerequisites: Admission to 5th-Year Program, EEC 600, EEC 610, EEC 660.

506. **Language Arts in Elementary & Early Childhood Education**. Materials and methods. Communication-based approach in developing effective language arts program. All aspects of language arts program addressed. Field experiencees required. Prerequisites: Admission to 5th-Year Program, EEC 600, EEC 610, EEC 660. 4 hours.

512. **Mathematics in Elementary & Early Childhood Education**. Material and methods of teaching mathematics. Emphasizes scope, sequence, and content of the mathematics program. Computation skills and problem solving are stressed. Includes field experiences. Prerequisite: Admission to 5th-Year Program, EEC 505, EEC 506, EEC 515. 4 hours.

513. **Science in Elementary & Early Childhood Education**. Scope, sequence, materials, and methods. Emphasis on teaching and the development of content and process skills. Field experiences completed in conjunction with practicum. Prerequisite: Admission to 5th-Year Program. 4 hours.

514. **Social Studies in Elementary & Early Childhood Education**. Scope, sequence, and content of elementary school social studies curriculum. Teaching strategies, program articulation, and instructional planning. Field experiences completed in conjunction with practicum. Prerequisite: Admission to 5th-Year Program. 4 hours.

515. **Learning Environments**. Theoretical approaches that focus on child-centered curriculum, classroom management, discipline strategies, and cultural, linguistic, and developmentally appropriate instruction. Prerequisites: Admission to 5th-Year Program, EEC 600, EEC 610, EEC 660.

540. **Advanced Workshop in Education**. May be repeated for total of 9 hours with various topics. 1-3 hours.

560. **Current Issues in Education**. Topics announced in class schedule. May be repeated for maximum of 6 hours with different topics. 1-3 hours.

565. **Teaching Globe and Map Skills**. Concepts and skills related to understanding functional use of globes and maps. Teaching strategies and methodologies for teaching concepts and skills. Curriculum scope, sequence, continuity, and application within social studies program.

673. **Teaching in a Multicultural Society**. Implications of cultural pluralism for teaching, student learning, curriculum planning, and instructional techniques. (Please place this in the correct numerical order.

592. **Individual Curriculum Projects: (Area Specified)**. Field projects in curriculum modification and improvement of classroom practice. Prerequisite: Permission of instructor. 3 or 6 hours.

593. **Individual Readings**. Individualized readings on special topics. Prerequisite: Permission of instructor. 1-3 hours.

594. **Field Work in Elementary and Early Childhood Education**. Observation and participation experiences with children. Prerequisite: Permission of instructor. 1, 2, 3, or 6 hours.

600. **Transition into P-6 Teaching**. Introduction to the teaching profession (Alternative Fifth-Year Program, Elementary/Early Childhood Education). 3 hours

610. **Curriculum Development in Elementary and Early Childhood Education**. Curriculum decisions, planning and implementation.

611. **Teacher Roles in Elementary and Early Childhood Education**. Models of instructional roles such as facilitator, program planner, curriculum designer; models of social roles. Includes practicum experiences.

612. **Models of Teaching**. Selecting and applying specific teaching strategies. Includes practicum experiences.

620. **Teaching Mathematics N-6**. Issues and approaches in early childhood and elementary mathematics; research and implementation for instruction.

621. **Teaching Language Arts N-6**. Issues and approaches in teaching early childhood and elementary school language arts. Implications of research for instruction.

622. **Teaching Social Studies N-6**. Function and organization of social studies programs in early childhood and elementary schools. Selection and adaptation of content, resources, teaching materials, and teaching strategies and methods with emphasis on current trends.

623. **Teaching Science N-6**. Issues and approaches in early childhood and elementary science. Implications of research for instruction.

625. **Critical Theory in P-6 Education**. Encompasses current issues in education from critical, postmodern, and feminist perspectives. Issues of equity, social justice, racism, sexism, and the marginalization of minorities in education will be explored. Prerequisites: Admission to Graduate School and EEC 660, Readings in Teaching and Learning. 3 hours.

628. **Master's Project**. Designed for the nontraditional 5th-year student in early childhood and elementary education. This one-hour seminar must be taken concurrently with the student's internship experience. 1 hour.

632. **Advanced Children's Literature**. Designed to explore literature for preschool, kindergarten, and primary- and intermediate-level children. Selection, use, and integration of literature throughout the total curriculum is stressed. Prerequisites: Admission to Graduate School or permission of the instructor. 3 hours.

650. **Systematic Reflections About Teaching**. Theory and practice of reflective inquiry in the elementary classroom which includes observations, data collection, analysis, and narrative reporting. Prerequisite: Admission into Graduate School. 3 hours.

660. **Reading in Teaching and Learning** An introductory course is designed to assist the student in locating, analyzing, and synthesizing current research in early childhood and elementary education. 3 hours.

670. **Studying the Child in School**. Analysis of child study in school; values and limitations of assessment.

671. **Creative and Affective Experiences**. Nature and nurture of creativity through creative learning experiences. Maintaining and preserving creative expression throughout curriculum.

672. **Piaget and Perspectives in Learning**. Piaget's theory of intellectual or cognitive development; applications to elementary and early childhood education. Prerequisite: Course in human growth and development.

674. **Language Development**. Developmental processes involved in language, relationship to education programs.

675. **Teaching in the Urban School**. Methods and materials; evaluation of school and school-related programs for equalizing educational opportunity.

676. **Discipline and Social Education**. Child growth and development as the basis for sound discipline in elementary school.

677. **Readiness for Learning**. Preschool and primary level language development and literacy development; assessment techniques.

678. **Primary Math: A Constructivist Approach**. New ways of teaching primary math based on Piaget's theory about how children acquire logico-mathematical knowledge.

680. **National Board Portfolio**. Prepares teachers for National Board Candidacy and to support candidates as they go through the certification process. Students enrolled in this course may be either precandidates or candidates for National Board Certification. Prerequisites: Admission to Graduate School and permission of candidate's advisor and course instructor. 6 hours.

690. **Internship in P-3/3-6**. Supervised teaching in an early childhood (P-3) and an elementary (3-6) program. The student gradually assumes responsibility for planning and teaching for the entire class (minimum of 12 weeks). The internship experience includes supervision in working with professional resource professionals and parents. Prerequisites: Approval of application for Internship in P-3/3-6. 9 hours.

691. **Practicum in ECE/ELE**. Prerequisite: Permission of instructor. 3 hours.

692. **Individual Curriculum Projects: (Area Specified)**. Field projects in curriculum modifications and improvement of classroom practice. Prerequisite: Permission of instructor. 3 or 6 hours.

693. **Independent Study**. Prerequisite: Permission of instructor. 1-3 hours.

694. **Field Study**. Prerequisite: Permission of instructor. 1, 2, 3, or 6 hours.

695. **Practicum Supervision in ECE/ELE**. Prerequisite: Permission of instructor or advisor. 2 hours.

696. **Internship Seminar**. Prerequisite: Concurrent enrollment in EEC 690. 2 hours.

698. **Independent Nonthesis Research**. Prerequisite: Permission of instructor.

699. **Thesis Research**. Prerequisites: Admission to candidacy and permission of instructor. 6 or 9 hours.

701. **Advanced Seminar in Language Development**. Relationship of thinking and knowing to language development; strategies for analysis. Prerequisites: EEC 674 or equivalent and master's degree.

702. **Administration and Supervision of Programs for Young Children**. Evaluation, decision making, supportive services, staff development, community interaction strategies. Prerequisite: Master's degree.

710. **Research**. Prerequisite: Permission of instructor. 1-3 hours.

English as a Second Language (EESL)

610. **Second Language Acquisition**. An in-depth look at major theories of second language acquisition. Exploration of learning environments, programs, home language, culture, and other factors that influence second language acquisition. 3 hours.

613. **Teaching ESL in a Multicultural Society**. Designed to introduce students to the goals, principles, and practices of multicultural education and to sensitize students to cultural pluralism in the United States. 3 hours.

615. **Grammar for ESL Teachers.** A critical study of aspects of Modern English grammar important for the teaching of English as a Second or Foreign Language. Students will gain an understanding of the major syntactic and semantic phenomena important for teaching ESL/EFL, become familiar with the practical and theoretical literature on teaching English grammar, participate in practical exercises of grammar correction in writing with actual ESL students, and develop and compile classroom activities for teaching points of grammar. 3 hours.

617. **Teaching English in a Global Context**. Provides a sociolinguistic perspective on the globalization of English and on the emergence and teaching of English as an International Language. Students explore dialectology, language change, language diversity, language ideology and power, national language policies, World Englishes, the growing number of non-native English speakers, and attitudes of native and non-native English speakers toward the domination of English. 3 hours.

620. **Special Topics in ESL**. Overview of institutional structures that support new language learners, curriculum and teaching accommodations supported by second language acquisition theory, support networks, and legal issues. (Recent topics: K-12 Equal Access) Prerequisite: EESL 610. 3 hours.

625. **Phonology for ESL teachers.** An introduction to phonology and its application to the teaching of English as a second or foreign language. Students learn the phonological structure of the English language, analyze examples from language learner data, diagnose pronunciation difficulties experienced by English language learners (ELLs) from different first languages, and identify instructional strategies for assisting ELLs to perceive and produce challenging English sounds. 3 hours.

627. **Teaching Adult Language Learners**. Introduces goals, principles, and practices for teaching English to adult learners, addresses the influence of varying backgrounds on adult language learning, and examines ways to evaluate adults' second language development. After learning to recognize quality components in distinct program models, as outlined by TESOL *Standards for Adult Education ESL Programs*, students do a critical study of community-based programs and English for Specific Purposes. 3 hours.

630. **Methods and Materials of Teaching ESL**. Examines traditional and current approaches to teaching English to speakers of other languages and curriculum materials, texts, and other resources. Prerequisite: EESL 610. 3 hours.

637. **Methods for Teaching English as an International Language**. Prepares students to teach English as an International Language by using methods, strategies, and techniques appropriate for adults in ESL contexts and for all learners in EFL contexts. Engaged with approaches aligned with TESOL Standards for ESL/EFL Teachers of Adults, students plan state-of-the-art curriculum, instruction and assessment for 5 program settings: adult/community, workplace, college/university, intensive English, and English as a Foreign Language. 3 hours.

640. **Teaching ESL through Reading and Writing**. Theory, research and practice in reading and writing for second language learners. Implications for teaching reading and writing skills that allow second language learners to participate in the full range of academic situations. Prerequisite: EESL 610. 3 hours.

647. **Instruction and Assessment: Reading and Writing**. Addresses linguistic, sociocultural, psychological, and educational factors that affect literacy development of English as an additional language. Grounded in theoretical and practical aspects of teaching second language (L2) reading and writing to adolescents and adults in diverse communities, students learn to implement effective instructional strategies for promoting literacy in English as an additional language. To measure attainment

of L2 reading and writing skills, students learn to design and conduct authentic assessments and to administer standardized assessments. Prerequisite: EESL 610. 3 hours.

650. **Strategies for Teaching Math and Science to ELLs**. Provides knowledge and strategies for making math and science accessible to ELLs at all grade levels, K-12. Classroom teachers will learn to make accommodations for teaching ELLs within a sheltered instruction framework. 3 hours.

657. **Instruction and Assessment: Listening and Speaking**. Examines how spoken communication is structured so that it is socially appropriate and linguistically accurate. Students learn principles and best practices for the contextualized teaching of second language (L2) listening and speaking skills to adolescent and adult learners. After exploring the purposes, types, and availability of formal testing tools to assess the attainment of these skills in English as an additional language, students also learn to generate and conduct their own tests for assessing L2 listening and speaking. Prerequisite: EESL 610. 3 hours.

660. **Research in ESL**. Primary types of research conducted in second language teaching and learning and how these methods can be used to inform teaching. Introduction to classroom-based second language research approaches. 3 hours.

687. **Practicum Seminar in Adult English Language Teaching**. An inquiry-focused course that guides emerging teachers in experiencing the differentiated facets of working in adult ESL and EFL environments. Students explore issues related to Intensive English Programs, English for Occupational Purposes, Program Administration, and English as an International Language. Students observe classes in regional IEPs, develop an EOP program, receive hands-on experience in administration, apply research to various adult EIL teaching situations, and do an in-depth study of an EFL context. Prerequisite: EESL 610. 3 hours.

689. **Internship Seminar in ESL**. Provides an opportunity to explore in-depth effective ways to deliver instruction during the internship experience. It must be taken concurrently with EESL 690 (9). Approval of internship application. 1 hour.

690. **Internship in ESL, N-12**. Meets the internship requirements of the state code. Interns are engaged in the full scope of teaching activities including planning and delivering lessons, evaluating students, and conducting managerial tasks and other appropriate duties. Prerequisite: Approval of internship application. 3, 6, or 9 hours

697. **ESL Practicum: Adult ELLs**. A standards-based course offering practical application of the knowledge and skills learned in other courses for teaching ESL to adult language learners. After doing

structured observations of professional ESL educators and participating in the corresponding debriefings, novice teachers engage in the full scope of ESL teaching activities. They plan and deliver lessons, evaluate learners and their language development, and conduct managerial tasks and other appropriate duties. Prerequisite: Approval of practicum application. 3 hours.

Foreign Language (EFL)

585. **Teaching Strategies for Foreign Language, N-12**. Approaches and methods of teaching and testing foreign language. Selection and use of audiovisual equipment and materials. Includes structured school observations. 6 hours.

598. **Student Teaching in Foreign Languages, N-12**. Supervised teaching in foreign languages (N-12). Prerequisite: Approval of application for student teaching. 9 hours.

691. **N-12 Foreign Language Internship**. Supervised foreign language teaching in elementary and secondary schools. Prerequisite: Approval of application for internship. 9 hours.

High School (EHS)

556. **Classroom Management in the Secondary Schools**. Designed to help teachers build their own personal system of discipline, consonant with their philosophies and personalities as well as with realities of students and schools. Emphasis on successful classroom management techniques.

558. **Science, Technology, and Society: A Primer for Education Majors**. (Also EHS 458). Explores nature of momentous changes: origin, current status, and future direction. Emphasis on role of educational community in helping young people to better understand and deal with various issues raised.

565. **Secondary School Curriculum: Mathematics**. Preparation to teach secondary school mathematics: making informed decisions about curricula, learners, and methodology in mathematics. Acquainting students with current state and national reforms in mathematics education. Problem solving, computers and calculators, and manipulatives in teaching mathematics. Developmental levels and individual differences of learners. Includes field experiences. Prerequisite: Admission to 5th-Year Program.

566. **Secondary School Curriculum: Language Arts/English**. A study of and practicum in the teaching of Language Arts and English in the secondary school; includes field experiences. Prerequisite: Admission to 5th-Year Program.

567. **Secondary School Curriculum: Science**. Teaching methods and curricula in secondary science programs. Includes field experiences. Prerequisite: Admission to 5th-Year Program.

568. **Secondary School Curriculum: Social Studies**. Understanding curriculum design and implementation as it relates to Social Studies in grades 7-12. Required demonstration of abilities to make informed decisions concerning what strategies to use with what students and how best to evaluate the students' progress in achieving the defined goals of a lesson. Includes field experiences. Prerequisite: Admission to 5th-Year Program.

569. **Secondary School Curriculum: Foreign Language**. Approaches and methods of teaching and evaluating foreign language at all levels. Includes field experiences. Prerequisite: Admission to 5th-Year Program.

570. **Practicum in Secondary Education**. Prerequisite: Concurrent enrollment in EHS 565, 566, 567, or 568. 1 hour.

571. **Special Education, Accommodation and Modification Lab**. Problems and issues in special education and the regular classroom. Concurrent enrollment in EHS 565, 566, 567, or 568. 1 hour.

597. **Special Problems in Education**. Seminar for seniors and graduate students; individualized readings and research projects based on student's special interests. May be repeated for total of 6 hours. 1-3 hours.

599. **Field Studies in Selected Educational Settings**. Field visits to locations of high educational impact, preceded by organized group meetings to develop background and concepts on which visits will be based; summation meetings follow visits. Individual projects and papers prescribed as appropriate. Credit determined by complexity of area or topic under study and necessary length of time rather than by distance involved. Cost for travel and other related arrangements to be announced for each study group. 1-3 hours.

600. **Secondary Education Curriculum and Methods I**. Introductory course in 5th-Year (nontraditional) Alternative Masters Program for high school education. Developing basic teaching skills and understanding of interdependence among all levels within school and community. Course requires 35 hours of field experiences beyond class meetings. 3 hours

611. **Advanced Special Methods for Teaching Foreign Languages**. Instructional objectives, classroom learning activities, utilization of differential pedagogical activities, improved use of source materials, and material sources.

612. **Teaching English, Grades 7-14**. Curriculum and instruction in English programs. Issues, materials, and methods. Field experiences required. Prerequisite: Undergraduate Language Arts methods.

614. **Teaching Social and Behavioral Sciences, Grades 7-14**. Advanced course in methods and materials of teaching social and behavioral sciences in high school. General philosophy and purpose of social science disciplines. Field experiences required. Prerequisite: Undergraduate Social Science methods.

615. **Methods of Teaching Science, Grades 7-14**. Science teaching methods, classroom interaction, current research, process skills, science/society issues, and cognitive development of students. Field experiences required. Prerequisite: Undergraduate Science methods.

616. **Teaching Mathematics in Secondary School**. Philosophical and psychological principles applied to teaching math. Field experiences required. Prerequisite: Undergraduate Mathematics methods.

644. **Workshop in Teaching (Selected Topics)**. Prerequisite: Permission of instructor.

645. **Inquiry in the Social Studies**. Inquiry and discovery techniques through use of simulation, games, role playing, and other group activities. Social studies projects, programs, and materials.

647. **Secondary School Programs**. Innovations, programs, and classroom practices; forces leading to recent trends.

650. **Teaching the Emerging Adolescent**. Curriculum, materials, and methods of instruction reflecting needs and characteristics of age group.

*651. **Innovative Practices in Teaching in Secondary School (Area Studies)**. Innovative practices in planning, instructing, and evaluating high school area studies. May be repeated if taken in different areas of study.

653. **Current Issues in Secondary Education**. Critical problems affecting teacher and curriculum in grades 6-14.

681. **Special Topics in Education**. Prerequisite: Permission of instructor. 1-6 hours.

690. **Internship Seminar in Secondary Education**. Prerequisite: Current enrollment in EHS 691. 1 hour.

691. **Secondary School Internship**. Observation and teaching in secondary school (15 weeks minimum). Includes attendance at a weekly seminar on campus. Prerequisites: Unconditional acceptance in 5th-Year Program and approval of application for internship. 9 hours.

692. **Field Studies in (Selected Educational Settings)**. 1-3 hours.

693. **Advanced Field Experience**.

695. **Secondary School Internship for Speech Communication/Theater**. Observation and teaching in secondary school (10 weeks or 300 clock hours minimum). Students also attend minimum of five 3-hour seminars designed to meet specific needs. Prerequisites: Unconditional acceptance in 5th-Year Program, completion of graduate methods course 9 hours in certification area, at least 9 hours in professional in addition to methods course, and approval of application for internship. 6 hours.

697. **Individual Readings in Education**. May be repeated for total of 6 hours. Prerequisite: Permission of advisor and instructor. 1-3 hours.

698. **Individual Research in Education**. Prerequisite: Permission of instructor. 1-6 hours.

699. **Thesis Research**. Prerequisites: Admission to candidacy and permission of instructor. 6 or 9 hours.

710. **Creative Teaching in Middle School**. Advanced methods and materials for teaching grades 6-9.

720. **Individual Research in Education**. Prerequisites: Master's degree and permission of instructor.

Elementary (ELE)

620. **Teaching Mathematics in the Elementary School**. Issues and approaches in elementary mathematics; research and implementation for instruction.

621. **Teaching Language Arts in the Elementary School**. Issues and approaches in teaching elementary school language arts. Implications of research for instruction.

622. **Teaching Social Studies in the Elementary School**. Function and organization of social studies programs in elementary schools. Selection and adaptation of content, resources, teaching materials, and strategies and methods. Emphasis on current trends.

623. **Teaching Science in the Elementary School**. Issues and approaches in elementary science. Implications of research for instruction.

624. **The Elementary School**. Organizational patterns in American elementary schools.

690. **Practicum in Elementary Education**. Prerequisite: Permission of instructor. 3 or 6 hours.

691. **Internship in Elementary Education**. Full-time internship as elementary education teacher for 10 weeks (300 clock hours). Responsibility as teacher for at least 10 days. 3 or 9 hours.

721. **Developing Effective Instruction in the Elementary School**. Leadership role of senior teachers; analysis and enhancement of instructional programs; development of teaching staff. Prerequisite: Master's degree.

Middle School (EMS)

590. **Middle School Internship**. Observation and teaching in middle school (10 weeks or 300 hours minimum). Students will attend a minimum of five 3-hour seminars designed to meet specific needs. Prerequisites: Unconditional acceptance in the 5th-Year Program and completion of graduate methods course, 9 hours in academic work, and at least 9 hours in professional courses in addition to the methods course.

648. **The Middle School**. Curriculum and principles in middle school education. Development of middle school from early junior high school movement. Examination of middle school programs and activities.

649. **Studies in Middle School Education I, II, III**. Advanced workshops in various phases of middle school program. Phase I foundations (history, growth and development, philosophy); Phase II, curriculum; and Phase III, instruction. 1-3 hours.

698. **Individual Research in Education**. Prerequisite: Permission of instructor. 1-6 hours.

699. **Thesis Research**. Prerequisites: Admission to candidacy and permission of instructor. 6 or 9 hours.

710. **Creative Teaching in Middle School**. Advanced methods and materials for teaching grades 6-9.

720. **Individual Research in Education**. Prerequisites: Master's degree and permission of instructor.

Music Education (EMU)

502. **Methods of Teaching Music N-6**. Teaching music in the elementary school environment. Investigation of critical elements in the teaching and learning process as related to music in grades N-6. Prerequisites: Permission of instructor. 3 hours.

503. **Methods of Teaching Music N-6 Laboratory**. Provides public school observation experiences for music education students enrolled in EMU 502. Prerequisites: Permission of instructor. 1 hour.

Educational Collaborative Teacher (ECT)

601. **Special Education Portfolio Process** (1 credit hour). Provides students with the knowledge and skills to begin the process of designing a standards-based electronic portfolio. Students will address the issues regarding the content and construction of electronic portfolios and the purpose of each stage of

development. Issues related to formatting options will be demonstrated and critiqued. Students will be required to develop and demonstrate the requisite skills for creating and filing critical information in a digital format. Students will review numerous portfolios for discussion. The focus will be a standards based product which each student will begin during this course.

650. **Master's Seminar in Collaborative Teaching**. A diagnostic and evaluation course designed to ensure that students have acquired basic competencies in historical, philosophical, legal, and assessment foundations in special education. Competencies addressed in this course also include research, writing, speaking, and computer literacy.

651. **Assessment Foundations in Special Education**. Designed to prepare special education teachers to assess children and youth in a manner that reflects federal and state mandates and regulations. Students are prepared to appropriately select, administer, and interpret assessment instruments designed to answer questions related to eligibility determination and, intervention programming.

652. **Characteristics of Children and Youths with High-Incidence Disabilities**. Details the characteristics, needs, and concerns related to children and youth with mild learning disabilities, mental retardation, and emotional-behavioral disorders. Additional issues addressed in the course are due process, inclusion, collaboration, and diversity as they pertain to these populations of students.

653. **Characteristics of Children and Youth with Low-Incidence Disabilities**. Details the characteristics, needs, and concerns related to children and youth with physical, health, sensory, and communication disabilities. Additional topics covered include positioning and handling, assessment, development of health care plans, and transdisciplinary collaboration.

654. **Instructional and Assistive Technology**. Identifying, designing, and implementing instructional and assistive technology devices and services. Topics covered include technologies for students with high- and low-incidence disabilities, general assistive technology adaptations, augmentative and alternative communication technologies, IEPs that incorporate assistive technology services and devices, and interagency collaboration.

655. **Elementary Methods for Students with High-Incidence Disabilities**. Provides students with knowledge and skill in instructional elementary content and methods. Issues related to designing, implementing, and evaluating instruction are presented. Additionally, the course provides critical information regarding the informal assessment of the teaching and learning processes. Specific methods for teaching reading, writing, mathematics, and study skills are covered.

656. **Secondary Methods for Students with High-Incidence Disabilities**. Provides students with knowledge and skill in secondary content and methods, including transition from school to adulthood. Issues related to designing, implementing, and evaluating instruction are presented. Additionally, this course provides critical information regarding the informal assessment of the teaching and learning processes. Specific methods for teaching reading, writing, mathematics, and study skills are covered.

657. **Methods for K-12 Students with Low-Incidence Disabilities**. Provides students with the knowledge and skills to teach learners with low-incidence disabilities in K-12 settings. Course content addresses issues related to positioning and handling, Alabama Extended Standards, IEP development, writing health care plans, assessment, and strategies for teaching reading, math, and writing.

658. **Advanced IEP Program Development**. Prepares students to utilize the general education curriculum as the foundation for educational programming for children and youth with special needs. IEP writing, using the general education curriculum, team planning, state- and district-wide assessments, and curriculum accommodations and modifications are topics addressed in this course.

659. **Classroom Management**. Prepares students to plan and manage the teaching and learning environment effectively. The major emphasis of the course is on the elements of classroom design and preparation. Primary and secondary academic and behavioral interventions are presented. Outcomes expected for students are related to the creation and maintenance of positive, caring classroom communities that facilitate the academic and social development of children and youth with disabilities.

660. **Positive Behavior Supports**. Prepares students to plan and manage the teaching and learning environment effectively. The major emphasis of the course is on the elements of classroom design and preparation. Primary and secondary academic and behavioral interventions are presented. Outcomes expected for students are related to the creation and maintenance of positive, caring classroom communities that facilitate the academic and social development of children and youth with disabilities.

661. **Collaborative Partnerships**. Provides an opportunity for students to develop the knowledge, skills, and ability to work collaboratively with professionals responsible for services provided to students with disabilities, their families, and their communities. Emphasis will be placed on blending general education, special education, and related services. The course consists of a series of topics and activities that are designed to provide an overview of collaboration and consultation, present issues related to diversity and inclusion, and highlight implications for special educators, general educators, related service personnel, students, the community, and families.

670. **Practicum in Collaborative Teaching: Grades K-6**. Students seeking Collaborative Teacher certification, Grades K-6, are required to complete a practicum experience in a collaborative setting that

includes children who present a wide range of disabilities. This practicum experience is tailored to the unique needs and experiences of students seeking this certification.

671. **Practicum in Collaborative Teaching: Grades 6-12**. Students seeking Collaborative Teacher certification, Grades 6-12, are required to complete a practicum experience in a collaborative setting that includes children who present a wide range of disabilities. This practicum experience is tailored to the unique needs and experiences of students seeking this certification.

672. **Internship in Collaborative Teaching: Grades K-6**. Students in the 5th-year, nontraditional program are required to complete a 12-week internship that is to be divided between lower and upper elementary settings. This internship is designed to assist the prospective graduate in virtually all teaching responsibilities in collaborative settings.

673. **Internship in Collaborative Teaching: Grades 6-12**. Students in the 5th-year, nontraditional program are required to complete a 12-week internship that is to be divided between lower and upper secondary settings. This internship is designed to assist the prospective graduate in virtually all teaching responsibilities in collaborative settings.

674. **Advanced Readings and Research in Special Education**. Allows the student to pursue an in-depth investigation of current and timely issues in the field of special education. The instructor and student design an individual program of study during the course, based upon student needs and interests.

675. **Survey of Attention Deficit Hyperactivity Disorder**. Provides teachers with the knowledge and skills necessary to implement an optimal teaching-learning environment for students with attention deficit hyperactivity disorder who represent diverse backgrounds in grades K-12.

676. **Survey of Pervasive Developmental Disorders**. An in-depth examination of the characteristics, needs, and other concerns of children and youth with pervasive developmental disorders. Topics also include interventions, collaboration, and functional life-skill programming.

677. **Combating Child Abuse and Neglect**. What constitutes child abuse? Perspectives will be offered from those affected by the tragedy of abuse, including victims, perpetrators, and the community at large: the family, educational, medical, political and legal systems. Intervention and prevention strategies will be stressed.

679. **Advanced Topics in Special Education Law**. Provides students with an in-depth examination of legal information pursuant to individuals with disabilities. The Individuals with Disabilities Education Act and its related amendments, the Americans with Disabilities Act, and Section 504 of the Improvement

Rehabilitation Act are major federal laws reviewed in this course. Special education litigation is also addressed during the course.

700. **Autism Spectrum Disorders: An Introduction**. Introductory course that focuses on characteristics of children and youth with autism spectrum disorders; trends and issues connected with autism spectrum disorders; and effective practices and strategies for structuring, managing, and promoting social skill development and social interactions between children and youth with autism spectrum disorders. 3 hours.

701. **Autism Spectrum Disorders: Application of Assessment Information**. Assessment-centered course that will guide the candidate in assessment, intervention, and programming for individuals within the autism spectrum. Candidates will learn to use formal and informal measures to identify student learning, language, sensory and regulatory needs, to design student-centered educational programming, write comprehensive evaluations, and select research based materials that match learner needs. 3 hours.

702. **Autism Spectrum Disorders: Methods for Moderate to Severe Functioning**. Methods course with special emphasis on low-functioning learners and individuals with autism spectrum disorders. Particular attention is given to effective practices and strategies for teaching and promoting functional and adaptive behavior that will enhance the learner's social responsibility and independent performance of daily activities. 3 hours.

703. **Autism Spectrum Disorders: Methods for High Functioning Learners and Asperger's Syndrome**. Methods course with special emphasis on learners with higher functioning autism spectrum disorders and Asperger Syndrome. Particular attention is given to effective practices and strategies for teaching and promoting social skill development and proactive social interactions. 3 hours.

704. **Autism Spectrum Disorders: Collaboration and Consultation**. Focuses on collaborative problem solving, consultation and related issues linked to educating students with autism spectrum disorders and related disabilities. 3 hours.

705. **Autism Spectrum Disorders: Seminars in Advanced Methods (2 credit hours)**. (20 clinical hours). To be taken concurrently with ECT 710.

710. **Autism Spectrum Disorders: Practicum, 5-8 credit hours**. Multi-faceted practicum course that encompasses seminar in advanced methods through ECT 705. A series of planned activities in diverse, integrated school continuums where participants continue to learn and practice their skills in a regulated program supervised by master teachers identified in the autism spectrum concentration. The required High Stakes Artifacts assist the candidates and their supervisors in evaluating their student teaching competencies. Must register for ECT 705 and ECT 710 at the same time.

720. **Universal Design for Learning.** Accommodations/modifications for learners; differentiated instruction; behavioral strategies; positive learning environments. School-based problem research project and field experience. 3-5 hours.

Exceptional Children and Youth (ECY)

600. **Introduction to Exceptional Learners**. An overview of exceptionality as it pertains to children and adults. Both high and low incidence populations will be examined. Each area of exceptionality will be reviewed in terms of etiology, diagnosis, prevalence, remediation, and educational strategies.

607. **Counseling Parents of Exceptional Children**. Dynamics of family life and parental and sibling reactions to handicapped individuals are addressed in this course. Prerequisite: ECY 600.

635. **Early Development and Intervention in ECSE**. Provides an introductory overview of the field of early intervention/early childhood special education (EI/ECSE) including the areas of historical and philosophical foundations of EI/ECSE. legal requirements, characteristics of young children with known or suspected disabilities, family-professional partnerships, service delivery options, recommended practices, current policy issues and trends, and professionalism and ethics. Prerequisite: ECY 600.

636. **Instructional Methods for Infants and Preschoolers with Disabilities**. Topics central to an adequate understanding of the conceptual and theoretical foundations underlying current educational curricula and methods for young children with disabilities and their families. Emphasis is on developmentally and individually appropriate practices that facilitate inclusive environments, as well as instructional strategies and technologies applied to instructional programs for young children with disabilities. Prerequisites: ECY 600 and 635.

637. **Assessment of Young Children with Disabilities**. Screening, assessment, program planning, and progress monitoring of young children with known or suspected disabilities. Both child-level and family-level assessment procedures are emphasized. Prerequisites: ECY 600 and 635.

638. **Motor and Health Care Needs of Young Children with Disabilities**. Effective intervention/education for young children with physical and health impairments. Included in the course are conceptual and theoretical foundations underlying typical and atypical motor development and neurodevelopment. Students become proficient in motor skill facilitation, positioning, handling, feeding and health care management. Prerequisite: ECY 600.

661. **Nature and Needs of the Visually Impaired**. Historical perspectives; definition and characteristics of persons who are blind, visually impaired or deafblind; and educational considerations. Prerequisite: ECY 600.

662. **Methods and Materials for Teaching the Visually Impaired**. Principles and procedures for developing and implementing curricula for persons who are blind, visually impaired or deaf-blind. Prerequisites: ECY 600 and 661.

663. **Orientation and Mobility**. Principles and fundamentals in teaching spatial orientation; guided practicum of demonstration, adaptations necessary for persons who are blind, visually impaired or deaf-blind. Prerequisites: ECY 600, 661, and 662.

664. **Braille**. Principles of teaching reading, transcribing and writing Braille; tests, curricula and technology for Braille literacy. Prerequisites: ECY 600, 661, 663.

665. **Anatomy of the Eye and Educational Implications of Visual Impairments**. Knowledge and evaluation of the visual system and use of low vision devices and other prescriptive devices for persons who are blind, visually impaired or deaf-blind; Prerequisites: ECY 600, 661, 663, and 664.

686. **Practicum Visual Impairments**. Clinical experiences with persons who are blind, visually impaired or deaf-blind in various educational settings; demonstration of curriculum development, assessment, and teaching in structured situations. Prerequisites: ECY 600, 661, 662, 663, 664, and 665.

670. **Practicum in ECSE**. Provides individualized field-based experiences to meet the unique needs of graduate candidates in ECSE. Students complete practicum experiences in settings that include children who present a wide range of disabilities within the 0-3, 3-5, 5-8 year age ranges. This practicum experience is tailored to the unique needs and experiences of each student. Prerequisites: ECY 600, 635, 636, 637, 638, and Permission of Instructor.

672. **Internship in ECSE**. Provides individualized field-based experiences that will meet the unique needs of ECSE candidates in the 5th year, nontraditional program. Students complete a 12-week internship in settings that include children who present a wide range of disabilities within the 0-3, 3-5, 5-8 year age ranges. This internship experience is tailored to the unique needs and experiences of each student. Prerequisites: ECY 600, 635, 636, 637, 638, and permission of instructor.

689. **Advanced Topics in Special Education**. A group seminar focused on transdisciplinary teaming in early intervention and early childhood special education. The course is designed for students representing the discipline of early childhood special education, general early childhood education, speech-language pathology, physical therapy, and occupational therapy. Prerequisites: Permission of instructor, ECY 600. 1-6 hours.

Education: Human Studies

- Counselor Education (M.A.C.N.)
- Educational Leadership (Ed.D., Ed.S., M.A.Ed.)
- Health Education, Community Health (M.A.Ed.)
- Health Education, Community Health with Clinical Research Management Certificate (M.A.Ed.)
- Health Education/Health Promotion (Ph.D.)
- Physical Education, Teacher Certification (Ed.S., M.A.Ed.)
- Physical Education, Exercise Physiology (M.A.Ed.)

Faculty

Wajih Ahmad, Assistant Professor; Health Education, Epidemiology

Michael Brooks, Associate Professor; Counselor Education. Counseling Theories, Social and Cultural Diversity, Career Counseling, Counseling Theories, Internship.

Loucrecia Collins, Associate Professor; Leadership; Curriculum, Conflict Resolution, Urban Education, Diversity, Bullying

Retta Evans, Associate Professor; Health Education - Youth Physical Activity and Nutrition, Body Image and Eating Disorders, Distance Education

Robin Fiedler, Assistant Professor; Measurement, Educational Psychology, Educational Statistics

Gordon Fisher, Assistant Professor; Exercise Physiology; Exercise/Nutrition, Mitochondrial Bioenergetics, Oxidative Stress, and Chronic Inflammation

Brian F. Geiger, Professor; Health Promotion Models, Comprehensive School Health, Technology, Community Education

Dennis Keith Gurley, Assistant Professor; (Leadership) Pre-Service and In-Service Development for School Leaders, Professional Learning Communities, and Organizational Theory

Donna J. Hester, Associate Professor; Motor Development, Physical Education Pedagogy

Gary R. Hunter, Professor; Exercise Physiology, Sport Conditioning, Body Composition and Energy Metabolism

Maxie P. Kohler, Professor; Personality Theory, Human Development, Educational Psychology, Psychological Testing, Literacy, Gender Studies

Tondra Loder-Jackson, Associate Professor; Foundations; Urban Education, Education and Birmingham Civil Rights Movement; African American Education, Life History of Educators, Home-School Relations

Andrew N. McKnight, Associate Professor; Foundations; Social Theory in Education, Equity in Education and Urban Education, Emotional Contexts in Education, Qualitative Interpretive Inquiry

Gary B. Peters, Associate Professor; Leadership; Organizational Theory

Cynthia J. Petri, Associate Professor; Health Behavior, HIV Education and Prevention, Technology, Theory

Jane Roy, Associate Professor; Exercise Physiology, Applied Kinesiology

Kristi Sayers Menear, Associate Professor; Physical Education Pedagogy, Adapted Physical Education

Melanie Shores, Associate Professor; Measurement, Math Education, Education of Girls, Gender Studies, Attribution

Sandra K. Sims, Associate Professor; Physical Education Pedagogy, Athletic Coaching

Scott W. Snyder, Associate Professor; Child Development, Measurement, Early Childhood Special Education, Program Evaluation

Laura Talbott Forbes, Associate Professor; Health Education - Alcohol and Other Drugs, College Health

Lawrence Tyson, Associate Professor; School Counseling, Theories, Professional Identity, Group Counseling, Adventure-based Counseling.

Larrell Wilkinson, Assistant Professor; Health Education, Health Disparities/Health Equity, Access and utilization of health care services, Substance Abuse

Program Contact Information:

Program	Coordinator	Room	Phone Number
Counselor Education	**Dr. Michael Brooks**	152	(205) 976-7908
Educational Leadership	**Dr. Loucrecia Collins**	223	(205) 975-1984
Health Education	**Dr. Retta Evans**	259	(205) 996-2701
Physical Education – Teacher Certification **Physical Education – Exercise Physiology**	**Dr. Sandra Sims** **Dr. Jane Roy**	232 205	(205) 996-2721 (205) 934-1757
Research	**Dr. Melanie Shores**	232	(205) 975-8487
Foundations	**Dr. Andrew McKnight**	222	(205) 934-6232

Counselor Education

Overview:

The program in Counselor Education at the University of Alabama at Birmingham prepares Clinical Mental Health and School counselors at the Master's level. At the master's level, students acquire core knowledge and clinical skills, which enable them to enter the profession of counseling.

All counseling concentrations (Clinical Mental Health and School) are designed to meet the course-work and field experiences requirements for professional licensure in the State of Alabama. The School Concentration is accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP). The School Counseling Concentration meets the course work and field experiences required by the Alabama State Department of Education for certification.

The Counselor Education program at the University of Alabama at Birmingham is accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP). The accreditation is through January 15, 2018. The Clinical Mental Health Counseling concentration, a 61 hour program, is currently accredited under the 2001 standards for Community Counseling programs as a Community Counseling program. The CACREP 2009 standards combine the Community Counseling and Mental Health Counseling standards into standards for Clinical Mental Health Counseling programs. The counseling program intends to seek accreditation for this program as a Clinical Mental Health Counseling program when it comes up for reaccreditation, per CACREP guidelines.

Admission Process

Consideration for admission to graduate study in counseling will occur each term The completed application packet must be received by the Counselor Education Program from the Graduate School by the dates shown:

Term	***Deadline***
Fall	June 1
Spring	October 1
Summer	April 1

Admission to graduate study in counseling is initiated through the Graduate School and all required materials are to be submitted per specified instructions delineated by the Graduate School.

Each applicant seeking admission to a counseling program concentration must include with the other required materials, a typewritten statement of professional purpose that reflects the applicant's background, development, pertinent work-related experience, professional career objectives and specified ways that completion of this program will contribute to his/her goal for becoming a professional counselor.

Standardized Test Scores and GPA Requirements

GPA 2.75 or better

GRE 850 (combined score of verbal and quantitative) or,

MAT 388

The application packet is reviewed by the Counselor Education faculty. Applicants deemed to have acceptable scores, strong references, appropriate statement of purposes, and grades will be invited for an interview that will include a group experience and a writing sample with the Counselor Education faculty. Applicants should not infer they have been admitted into the program if granted an admissions interview. Selection will be made by the Counselor Education faculty after reviewing the applicant's credentials in their entirety, and some candidates meeting minimum requirements may not be admitted. Candidates participating in the interview may be given one of two decisions: a) admit, b) denied. Students are notified of their admission status following the interview.

Non-Degree Seeking Students

Potential students may take classes prior to admission to the Counselor Education Program as "non-degree seeking" students. However, non-degree seeking students are limited to 12 hours of coursework that may be transferred into the Counselor Education Program. Non-degree seeking students may enroll in elective courses with the permission of the instructor. It would be important for non-degree seeking students to make an advising appointment with a Counselor Education faculty member prior to enrolling in Area II courses as choices made could impact on future clinical placements. Non-degree seeking students are not permitted to take Area I counseling courses. It is also important to note that students taking coursework as a non-degree seeking student do so at their own risk. Enrolling and passing non-degree seeking coursework *does not* guarantee admission into the program as admission criteria (e.g., test scores, undergraduate GPA, and interview) are the primary factors considered when reviewing student suitability for the program

Program Outcomes

Students in the program are required to meet specific outcomes for the program. These outcomes involve knowledge, skills, and abilities. Outcomes are met when students pass critical “high stakes” assessments in the program. Failure to achieve the required outcomes will result in termination from the program.

Evaluation of Candidates

There are 7 Checkpoints in the assessment system for counseling candidates: Admissions, Course-based Assessments, Comprehensive Exams, Practicum, Internship, and Eligibility for Graduation/Certification. Evaluation of the counselor-in-training is an on-going process. The faculty reserves the right to assess the candidate's appropriateness to be a professional counselor.

Dispositions

Counselor Education faculty individually review the professional dispositions (behaviors and attitudes) of students within each course in accordance with the School of Education’s policy and procedure. Additionally, faculty will collectively review student dispositions and overall progress in the program at the end of each semester. Dispositional areas identified as deficient could result in termination from the program**.**

Clinical Experience: Master’s Level

Upon admission, within the first semester of study, students in the school counseling concentration must submit to fingerprinting and a Background Review conducted by the Alabama State Department of Education at the student’s cost. For information on the cost and how to complete this requirement, go to http://background.alabama.gov/. No school counseling student shall begin a clinical placement (Practicum or Internship in an education environment) in Alabama without a suitability letter from the Alabama State Department of Education demonstrating that the student’s criminal background has been reviewed and cleared by the Department of Education. Mental Health counseling students are not required to submit to fingerprinting or a background review upon admission to the Counselor Education Program. However, mental health counseling students are required to complete clinical placements in order to obtain the master’s degree in counseling and many of the outside agencies/entities require fingerprinting and background reviews prior to accepting a student for clinical placement. For all counseling students, the appearance of one or more felonies and/or several misdemeanors on a student’s background review may negatively impact placement potential and/or credential obtainment.

Prerequisites for the clinical experience include successful completion of required coursework, meeting the required outcomes and competencies in Areas I and II, and successful completion of comprehensive exams. The practicum experience requires a minimum of 100 hours (including **40 hours of direct client contact)** on-site at an appropriate setting to be determined by the Clinical Coordinator. The internship is 600 hours (**including 240 hours of direct client contact**) on-site. Grading for the clinical experiences is

on a Pass/Fail basis. To receive a Pass grade the counselor-in-training must be able to demonstrate basic counseling skills, behave in an appropriate professional manner consistent with the American Counseling Association's Code of Ethics, and satisfactorily complete the academic, dispositional and outcome requirements set forth in both the practicum and internship classes. If a student fails to pass any part of the clinical experience, he or she will not be allowed to continue in the program. Taking the clinical experience over will **not** be an option.

Concentrations: Master's Level

Clinical Mental Health Counseling

The Master of Arts in Counseling with a concentration in Clinical Mental Health counseling is designed to prepare students to demonstrate knowledge and skills with several counseling modalities appropriate for a broad range of clients in a multicultural society; interact effectively with other helping professionals and referral resources; make appropriate counselor-client related decisions in the context of professional, ethical, and legal guidelines; and fill effectively entry-level positions of professional responsibility within the specialization of agency counseling. The coursework is approved by the Alabama Board of Examiners in Counseling, which allows graduates of the program to pursue licensure as professional counselors in the state of Alabama. This program takes no less than 3 years to complete. For most students, it takes approximately 3.5 years or 10 terms (including summers) to complete the program.

COURSE OF STUDY

(61 Semester Hours)

Area I:

(28 semester hours)

EPR 590	Research and Program Evaluation in Counseling
ECG 612	Professional Orientation
EPR 614	Human Growth and Development
ECG 621	Theories of Individual Counseling
ECG 624	Assessment: Individual and Group (Prerequisites: EPR 590
ECG 626	Group Counseling: Process & Procedures (Prerequisites: ECG 621 & ECG 638)
ECG 628	Social and Cultural Diversity
ECG 630	Career Development: Vocational and Life Planning
ECG 638	Practicum I: Clinical Skills and Techniques (Prerequisite: ECG 621)

Comprehensive Exam

The Counselor Preparation Comprehensive Exam will be given upon completion of Area I. This is a "high stakes" assessment. Students who do not successfully pass this examination will be given the opportunity to re-take the exam a maximum of two times. There are no exceptions. Students unsuccessful in passing the comprehensive exam will be dismissed from the program.

AREA II:

(24 semester hours)

ECG 600	Introduction to Community Counseling
ECG 650	Diagnosis and Treatment of Mental Disorders
	Elective (discontinued, fall, 2012)
	Elective (discontinued, fall, 2012)
ECG 631	Suicide: Prevention, Intervention and Postvention (required, fall, 2012)
ECG 651	Human Sexuality for Counselors (required, fall, 2012)
ECG 613	Foundations of Substance Abuse (required, fall, 2012)
ECG 652	Advanced Counseling Techniques (required, fall, 2012)
ECG 653	Counseling Children and Adolescents (required, fall, 2012)
ECG 691	Intro to Families and Couples Counseling (required, fall, 2012)

AREA III: Clinical Requirements

(9 semester hours)

ECG 695	Practicum II: Supervised Field Experience (3 semester hours) (Prerequisites: Areas I & II, Comprehensive Exams, and recommendation of the faculty**)** **Practicum is 100 hours minimum with 40 hours of direct client contact**
ECG 697	Counseling Internship (6 hours-2 semesters) (Prerequisite: ECG 695) **Internship is 600 hours with 240 hours of direct client contact**

School Counseling

According to the American School Counseling Association, "the purpose of a counseling program in a school setting is to promote and enhance the learning process." The goal is to enable all students to achieve success in school and to develop into contributing member of our society.

The concentration in School counseling is designed to prepare individuals as counselors in grades K-12. The program leading to the Master of Arts in Counseling degree requires a minimum of 49 semester hours of prescribed coursework to meet the academic and field experience requirements for the SDE Class A Professional Certificate in school counseling.

Admissions: In addition to the admission requirements for the Counselor Education Program, candidates seeking admission to the school counseling concentration must possess a minimum of a 2.75 undergraduate grade point average. Before the school counseling student can receive certification, the school counseling student must satisfactorily obtain a passing score on the following assessments: Alabama Test of Basic Skills, the Praxis II Test in School Counseling, the National Counselor Exam.

The school counseling concentration meets the course work and field experiences required by the Alabama State Department of Education for certification. The concentrations meet the academic and field experience requirements for licensure as professional counselors in Alabama.

COURSE OF STUDY

(49 Semester hours)

Area I:

(28 semester hours)

EPR 590	Research and Program Evaluation in Counseling
ECG 612	Professional Orientation
EPR 614	Human Growth and Development
ECG 621	Theories of Individual Counseling
ECG 624	Assessment: Individual and Group (Prerequisites: EPR 590)
ECG 626	Group Counseling: Process & Procedures (Prerequisites: ECG 621 & ECG 638)
ECG 628	Social and Cultural Diversity
ECG 630	Career Development: Vocational and Life Planning
ECG 638	Practicum I: Clinical Skills and Techniques (Prerequisite: ECG 621)

Comprehensive Exam

A National Comprehensive Examination will be given upon completion of Area I. This is a “high stakes” assessment. Students who do not successfully pass this examination will be given the opportunity to re-take the exam a maximum of two times. There are no exceptions. Students unsuccessful in passing the comprehensive exam will be dismissed from the program.

AREA II:

(12 semester hours)

ECG 620	Foundations of School Counseling
ECG 623	Comprehensive Counseling and Guidance: Middle & High School
ECG 627	Comprehensive Counseling and Guidance: Elementary School
	Elective (discontinued, fall, 2012)
ECG 619	Special Issues For School Counselors (required, fall, 2012

AREA III: Clinical Requirements

(9 semester hours)

ECG 695	Practicum II: Supervised Field Experience (3 semester hours) (Prerequisites: Areas I & II, Comprehensive Exams, and recommendation of faculty**)** **Practicum 100 hours; 40 direct hours.**
ECG 697	Counseling Internship (6 hours-2 semester hours) (Prerequisite: ECG 695) **Internship 600 hours; 240 direct hours**

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit. Counseling and Guidance (ECG)

600. Introduction to Community Counseling. Individuals entering the counseling profession to work with community agencies and organizations are facing a paradigm shift in the way many traditional counselors think and act. This course addresses the specific needs of students preparing for contemporary counseling careers in community/agency settings including the multi-faceted roles and functions of a professional counselor, the counseling needs of special community populations, and the professional/ethical issues unique to community counseling.
612. Professional Orientation. Emphasis on understanding of professional roles and responsibilities; ethical and legal issues; historical perspectives; preparation standards; credentialing; trends and issues in the counseling profession. Prerequisite: Admission to the Counselor Education Program.

613. Foundations of Substance Abuse. Surveys the field of substance use, abuse, and dependency, providing an overview of macro and micro issues and using various models of addictions. Topics examined include: historic and current theories of addiction and treatment, the substances of addiction, their effects, their signs and symptoms, addiction and special populations, direct practice with individuals, families, groups, community level intervention and public policy issues, and outcome research. Participants will be exposed to community based support groups and treatment professionals.

619. Special Issues for School Counselors. Exposure to a variety of critical incidents that cover a variety of experiences will be presented in a seminar environment and will require the student counselor's expertise and proper response. Authorities from the various school systems, law enforcement agencies,

counseling/mental health agencies, and child protective agencies will provide knowledge and insight from their perspectives.

620. Foundations of School Counseling. Social, psychological, economic, and philosophic trends leading to development of guidance programs in American schools are explored. Organization and administration of guidance services are emphasized.

621. Theories of Individual of Counseling. Students will be provided an introduction to counseling theories. Students will explore beliefs about different approaches and methods of counseling. Prerequisite: Admission to the Counselor Education Program**.**

622. Group/Classroom Guidance in Schools. The process and practice of group and classroom guidance with children K-12 will be explored.

623. Comprehensive Counseling and Guidance in Middle and High School. The purpose of this course will be to develop an understanding of the nature of middle/high school children as related to their guidance and counseling needs. The student will be able to understand the role and function of the middle/high school counselor and understand the essential features of a comprehensive, developmental, guidance program at the middle/high school level. Additionally, the student will be able to understand the elements of a pre-college counseling and guidance program and understand the ethical and legal issues that directly relate to middle/high school counseling and guidance programs.

624. Assessment. Overview of instrument review and selection, measurement methods, administration and interpretation. Emphasis on common assessment instruments used in schools and public agencies. The use of assessment data in program outcome evaluation will also be explored. Prerequisites: Admission to the Counselor Education Program; ~~ECG 607/608~~; EPR 590; ~~ECG 624~~.

626. Group Counseling: Process/Procedures. This course provides an introduction to many of the important challenges facing group leaders and group members in contemporary society. Ethical guidelines particular to group work will be discussed. Students will be exposed to how common counseling theories can be applied in group settings. Students will gain an understanding of group developmental stages and processes, and how these dynamics influence group growth and productivity. Leader skill development will be emphasized. Approximately 20 hours of class time is spent in a laboratory experience wherein each student is provided the opportunity to function in a group. Prerequisite: Admission to the Counselor Education Program; ECG 621.

627. Comprehensive Counseling and Guidance: Elementary School. Guidance services and activities appropriate for preschool and elementary grades; facilitating intellectual, psychological, and social development during early school years.

628. **Social and Cultural Diversity.** Survey of issues and principles for relating professionally to individuals from diverse backgrounds and lifestyles. Includes sensitivity to differences in values, beliefs, attitudes, and culture. Prerequisite: Admission to the Counselor Education Program.

629. Counseling Families in a Multicultural Society. The intent of this course is to facilitate an understanding of family dynamics and cultural sensitivity. This course provides opportunities for students to explore, understand, and appreciate families from culturally diverse backgrounds. Contents include family and multicultural theories/concepts related to structure, dynamics, growth and development, assessment, counseling interventions, and research.

630. Career Development: Vocational and Life Planning. This course will introduce students to the concepts of career development. Counselors-in-training will learn career theories and how to apply career theory to practice. Instruction will include career assessment, life planning principles, sources of career information, labor marker information, job search strategies, and examination of workplace issues.

Additionally the on-line version of this course will include computer applications associated with career development. Prerequisite: Admission to the Counselor Education Program.

637. Adlerian Family Counseling. Helping parents understand children. Parent-child relationship promoting responsibility, self-reliance, cooperation, mutual respect, and self-esteem.

638. Practicum I: Clinical Skills and Techniques. Skills and techniques for establishing effective interpersonal relationships. Prerequisite: Admission to the Counselor Education Program; ECG 621.

650. Diagnosis of Psychological Disorders. This course is designed to give the students an overview and general understanding of the etiology, assessment, diagnosis, and treatment of the various mental disorders. Specifically, the course will familiarize students with the different psychological disorders in the DSM-IV and the psychological and psychopharmacological treatment of these disorders.

651. Human Sexuality for Counselors. This course is an overview of a family systems approach to understanding and treating clinical issues related to human sexuality.

652. Advanced Counseling Techniques. This course will involve the study of theoretical approaches to counseling which have been demonstrated to be culturally-relevant and conceptually inclusive of multiple theories and techniques: Ivey's Developmental Counseling and Therapy (DCT) and Adlerian Individual Psychology as well as other relevant theories. Selected readings, academic discussion, and clinical application will be stressed. Critical thinking and active participation are essential. Students will focus on the application of theoretical information towards a goal of case conceptualization as a precursor to effective treatment planning.

653. Counseling Children and Adolescents. This course will review current evidenced based treatment interventions for children and families. Candidates will learn play therapy techniques, art therapy techniques, and behavioral interventions including how to create behavioral contracts, and methods for writing informative treatment plans. Candidates will also learn specific strategies for engaging parents and siblings in treatment, and will learn specific structural and narrative based theoretical approaches to family therapy.

660. Dynamics of Child Sexual Abuse. Critical concerns and issues, effective techniques and practices for dealing with survivors of child sexual abuse.

661. Play Therapy I. Designed to provide students with instruction in the history and theories of play therapy and experiential knowledge in applying play therapy strategies with children. Meets the Association for Play therapy requirements for instruction in history and theories of play therapy and provides 67.5 Continuing Education hours for the Association (Prerequisite: ECG 621 & 638).

662. Play Therapy II. A course designed to provide students with instruction in play therapy with special populations and specialized therapeutic methods including sand play/sand tray, group play therapy, play therapy in home and school, family play therapy and filial family therapy. Provides 67.5 CEU hours for the Registered Play Therapist credential (ECG 661).

663. Challenge Course Fundamentals I. Improvement of self-concept and social skills through physical, spiritual, emotional, and mental development in creative activity outdoors. Natural environment used as a learning laboratory for leadership, teamwork, problem solving, decision-making, and conflict resolution and physical fitness.

664. Challenge Course Fundamentals II. This course continues introducing to the background, philosophy, ethical issues, risk management required for high ropes facilitation. Introduces students to a variety of high challenge course initiatives used for learning and problem solving, trust team building, and

self-confidence and communication skills. How to present high challenge course initiatives to diverse groups will be emphasized. Specific attention will be given to addressing learners of different ages and varying abilities. Additionally, an overview will be given of how counseling and ropes courses experiences can be integrated.

665. Adventure Processing and Facilitation. This course provides the skills necessary for facilitating a variety of groups-educational, recreational, corporate-indoor experience programs. The curriculum includes the Experiential Learning Cycle, stages of group development, leading group discussion, active listening, frontloading, debriefing, use of metaphors, and transfer of learning. Activities are used to facilitate leadership, teamwork, problem-solving, decision-making, and conflict resolution. This knowledge will enhance students' ability to adapt their programs to various groups. How to facilitate and lead group discussions with diverse groups will be emphasized.

666. Organization and Administration of Adventure Education. Students will synthesize their experience in adventure leadership, instruction and programming to explore the details of managing an adventure program. Topics include risk management, legal issues, accreditation standards, staff recruitment, hiring and training, marketing, and fiscal management. Special attention will be given to managing a universally designed challenge course.

674. Seminar on Death, Dying, and Bereavement. Provides general knowledge of death, dying, and bereavement issues faced in today's society.

691. Seminar: Special Topics in the Helping Professions. Emerging trends, techniques, and issues. Topics vary from semester-to-semester. Examples of topics include Spirituality in Counseling, Clinical Documentation, Marriage and Family, Sexual Addiction, Personality Types, Pharmacology in Counseling, Gender Issues, etc.

692. Independent Readings in Counselor Education.. A prospectus of the proposed reading must be submitted in advance for faculty approval before for the course. Prerequisite: Permission of advisor and instructor.

695. Practicum II: Supervised Field Experience. This clinical course is designed to give students the opportunity to demonstrate basic counseling skills with students/clients at a school or agency and to begin to move toward proficiency. Knowledge and skills developed in previous coursework will be applied in the clinical setting. The counselor-in-training is involved in serious counseling interactions with clients. Student counselors receive feedback and supervision from on-site supervisors, group seminar supervisors, and UAB faculty members. Counselors in-training are assigned to a school, agency, or rehabilitation setting for a **minimum** of **100** clock hours, **40** of the hours must be in **direct service** with clients. Prerequisite: Completion of Areas I and II, and comprehensive exams; permission of clinical coordinator.

697. Counseling Internship. The internship provides an opportunity for the student to perform, under supervision, a variety of activities that a regularly employed counselor would be expected to perform in the clinical setting. The counselor-in-training is involved in serious counseling interactions with clients. Student counselors receive feedback and supervision from on-site supervisors, group seminar supervisors, and UAB faculty members. Counselors in-training are assigned to a school, agency, or rehabilitation setting for a **total** of **600** clock hours, **240** of the hours must be in **direct service** with clients. Prerequisite: ECG 695.

Educational Foundations

EDF 600. Urban Education. An examination of the historical, social, political, and economic factors that shape urban education in America.

EDF 601. History of the American Curricular Thought. An examination of American educational history using primary source documents to provide insight into the evolution of curriculum, policy, and educational practice.

EDF 602/702. Critical Social Issues in American Education. An examination of contemporary social issues facing American schools, from politics and policy, school structure, and curriculum to pedagogical practice. The relationship of the school to society is also addressed.

EDF 603/703. Philosophy and Education. An examination of various philosophical schools of thought, their application to the field of education, and their relevance to teaching, learning, and life.

EDF 604/704. Social Philosophies and Education. An examination of various schools of social and political philosophy and theories pursuant to contemporary educational problems. Topics may include class structure, the cultural context of schooling, identity politics, ecological issues, physical and mental health issues, and the history of social theory related to educational policy and practice.

EDF 606/706. Social Movements in Education. An examination of how the Progressive education movement, along with other major social movements in recent history have shaped American education. The history of the Civil Rights Movement in Birmingham and its impact on schools, communities, and the lives of educators and students are of special interest.

EDF 608/711. Theories of Knowledge. An examination of the various philosophical and cultural conceptions of knowledge, and how these inform and impact research, educational practice, and lived experience.

EDF 616/716. Comparative Education. An examination of the cultural forces influencing the structure and function of education in selected countries. Cultural forces influencing structure and function of educational system in selected countries.

EDF 620/720. Culture and American Education: Race, Class, and Gender. An examination of the complexities of and controversies surrounding culture, race, ethnicity, social class, and gender in American education with emphasis on the historical and contemporary experiences of K-12 students and families in the majority population of the Birmingham City Schools and the "majority-minority" population of Birmingham's suburban school districts (i.e., African American and Hispanic/Latino/a).

EDF 624/724. Ethics and Education. The focus of this course is twofold: first, it covers some of the foundational materials in the philosophy of ethics, and their application to the field of education; second, it looks at the present moral context of schools and the problems and potentials of morally directed education.

EDF 691. Special Problems in Educational Foundations. A topical seminar on special problems and issues in educational foundations.

EDF 697. Individual Readings in the Foundations of Educations. Independent study in the foundations of educations.

EDF 698/798 Individual Research in the Foundations of Education. An independent study with the aim of conducting original research in the foundations of education.

EDF 713. History of Educational Philosophy. A historically sequenced survey of educational philosophy from the ancient Greeks, 18th century enlightenment thought, American pragmatism, and existentialism to postmodernism.

EDF 750. Special Problems in Educational Foundations. A topical seminar on special problems and issues in educational foundations.

EDF 797. Independent Study. Independent readings under the direction and supervision of EDF faculty. Doctoral status and the permission of the instructor are required.

Educational Leadership

Because admission to these programs is selective, prospective students should contact a departmental advisor to determine specific admission requirements for the degree or certificate in which they are interested, or consult the requirements posted on the website at www.ed.uab.edu/educationalleadership.

The following degrees are offered: MAE in Instructional Leadership (leading to Alabama Class A Certification in Instructional Leadership); the Educational Specialist Degree (leading to Alabama Class AA Certification in Instructional Leadership – must have Class A in Instructional Leadership first); the Doctorate of Education degree (Ed.D.) in Educational Leadership (must have Ed.S. in Educational or Instructional Leadership to apply).

The programs leading to the Doctorate of Education (Ed.D.) degree in educational leadership are offered at UAB by the joint faculties of UAB and the University of Alabama (Tuscaloosa). Admission is highly selective and is open only once annually. In addition to the Graduate School requirements, an interview, portfolio, and on-site writing sample is required by the program.

Additional Information

For detailed information, contact Dr. Loucrecia Collins, Program Director, Educational Leadership, Department of Human Studies, UAB School of Education, 1530 3rd Avenue South, EB 223, Birmingham, AL 35294-1250.

Telephone: 205-975-1984

E-mail: lcollins@uab.edu

Web: www.ed.uab.edu/educationalleadership

Dispositions

Dispositions

Educational Leadership faculty individually review the professional dispositions (behaviors and attitudes) of students within each course in accordance with the School of Education's policy and procedure. Additionally, faculty will collectively review student dispositions and overall progress in the program at the end of each semester. Dispositional areas identified as deficient could result in termination from the program**.**

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded by an asterisk indicate courses that can be repeated for credit, with stated stipulations.

Educational Leadership (EDL)

EDL 601 Foundations of Instructional Leadership – 3 credit hours

The purpose of this course is to provide a strong foundation in strengthening knowledge and skills in instructional leadership. As a foundation course, Through a combination of course assignments and accompanying field based experiences involving observing, participating and leading in a school setting, the student will be prepared to become an instructional leader who engages the school community in developing and maintaining a shared vision; plans effectively; uses critical thinking and problem-solving techniques; collects, analyzes, and interprets data; allocates resources; and evaluates results for the purpose of continuous school improvement.

EDL 602 Field Experiences in Foundations of Instructional Leadership – 1 credit hour

This course provides the student with practical, authentic leadership experiences related to EDL 601 Foundations of Instructional Leadership. These field experiences are conducted under the guidance of a trained mentor and UAB clinical field supervisor.

EDL 603 Data Driven Decision Making for Instructional Leadership 3 credit hours

This course prepares the future school leader to effectively use and interpret data in all forms to effectively lead and monitor continuous school improvement, especially student achievement. The future leader will become conversant with technologies that enhance classroom instruction as well as assist in the management of the school. The future school administrator will have opportunities to lead in a school by conducting an action research project which addresses a student achievement issue and conducting a Needs Assessment for Technology Planning.

EDL 604 Field Experiences in Data Driven Decision Making for Instructional Leadership – 1 credit hour

This course provides the student with practical, authentic leadership experiences related to EDL 603 Data Driven Decision Making for Instructional Leadership. These field experiences are conducted under the guidance of a trained mentor and UAB clinical field supervisor.

EDL 605 Residency in Instructional Leadership – 6 credit hours

The purpose of the Residency in Instructional Leadership course is to give the future leader authentic experiences on a continuum of observing, participating, and leading in K-12 schools without the distraction of teaching responsibilities or other coursework requirements. This is achieved through a 10-consecutive day period in a K-12 school setting. The candidate earns 6 credit hours for the Residency. It must be the last

course in the student's course of study in the Master's Degree in Instructional Leadership.

EDL 606 Supervision & Mentoring of Instructional Staff – 3 credit hours
The purpose of this course is to prepare the future school leader to utilize knowledge of human resources to accomplish school and system goals. This includes supervising and evaluating teachers, mentoring new teachers, developing the ability to design and implement effective professional development for individual teachers and the entire staff, as well as learning how to facilitate teaming in the school that will impact student achievement. A final unit in the course will assist the future leader in seeking a mentor for him/herself.

EDL 607 Field Experiences in Supervision & Mentoring of Instructional Staff – 1 credit hour
This course provides the student with practical, authentic leadership experiences related to EDL 606 Supervision and Mentoring of Instructional Staff. These field experiences are conducted under the guidance of a trained mentor and UAB clinical field supervisor.

EDL 608 Organizational & Financial Management for Instructional Leaders – 3 credit hours
This course is designed to prepare instructional leaders with the knowledge and ability to apply finance procedures for public schools in Alabama. An emphasis on strategies to utilize student data as the impetus for allocating financial resources will be part of the curriculum. In addition, students will explore guidelines for creating safe school facilities.

EDL 609 Field Experiences in Organizational & Financial Management for Instructional Leaders – 1 credit hour
This course provides the student with practical, authentic leadership experiences related to EDL 608 Organizational & Financial Management for Instructional Leaders. These field experiences are conducted under the guidance of a trained mentor and UAB clinical field supervisor.

EDL 610 Legal and Ethical Foundations of School Leadership – 3 credit hours
The purpose of the course is twofold: 1) Candidates will gain a fundamental knowledge of ethical principles based on the Alabama Educator Code of Ethics and guidelines of the State Ethics Commission & 2) Candidates will gain a working knowledge of legal principles established by local, state, and federal legislative and judicial requirements.

EDL 611 Field Experiences in Legal and Ethical Foundations of School Leadership – 1 credit hour
This course provides the student with practical, authentic leadership experiences related to EDL 610 Legal and Ethical Foundations of School Leadership. These field experiences are conducted under the guidance of a trained mentor and UAB clinical field supervisor.

EDL 612 Instructional Leadership for Diverse Populations - 3 credit hours
The purpose of this course is to prepare leaders who will provide instructional leadership for all students. Issues related to equity, diversity and their implications for educational settings will be analyzed. Candidates will explore the construct of diversity as it relates to: race, gender, special needs populations, socio-economic status, culture, sexual orientation, and second language learners. Candidates will be challenged to examine best instructional leadership practices toward these critical issues and to develop sensitive and proactive responses to changing demographics. Candidates will assess the leadership capacities needed to ensure access, academic rigor and social equity for all members of the school community.

EDL 613 Field Experiences for Instructional Leadership for Diverse Populations – 1 credit hour.
This course provides the student with practical, authentic leadership experiences related to EDL 612 Instructional Leadership for Diverse Populations. These field experiences are conducted under the guidance of a trained mentor and UAB clinical field supervisor.

620. **Public School Organization and Administration**. **– 3 credit hours**
This course provides a survey of historic and current organizational theories and an exploration of how these theories may be applied to leadership practice in K-12 public school settings. The course is linked to and directly addresses state and national standards for organizational leadership for educational leaders. Future school leaders will become conversant with key organizational management and leadership strategies with an emphasis on how to positively affect student learning through effective organizational leadership.

621. **The School Principalship**. **- 3 credit hours** Changing role and responsibilities of school principal; organization, discipline, instructional supervision, and community relations.

622. **Clinical Supervision for Administrators and Supervisors**. **- 3 credit hours**
Knowledge, skills, and competencies for assisting teachers in improvement of curriculum and instruction.

630. **School and Community**. **– 3 credit hours**
This course provides an overview of strategies and techniques available to future school leaders in their efforts to partner with key stakeholder groups both inside and beyond the school walls. Emphasis is placed on involving stakeholders in providing input and participation in planning and decision-making processes with an emphasis on garnering the support of community members to affect increased levels of student learning and academic success.

631. **Education and the Political Environment**. - **3 credit hours** Educational policy making and governance as political process; political theory and structure.

635. **Survey of School Law**. **3 credit hours** Laws and court decisions affecting public education. Cases establishing mandates for public school practices.

637. **Legal Liability and the Educator**. **3 credit hours** Legal liability in administration and teaching. Cases pertaining to education.

640. **Introduction to Community Education**. **3 credit hours** Structure, purpose, and processes of community education and community schools.

641. **Community Education for School Administrators**. **– 3 credit hours**
This course introduces future school leaders to the process of leveraging available community and Web-based resources to enhance adult and student learning throughout the school environment. Emphasis is placed on aligning community and Web-based resources to meet professional development needs for educators and to augment student learning experiences by connecting with and utilizing resources beyond the school walls.

642. **Operation and Administration of the Community Education Program**. **– 3 credit hours**
This course is offered as a follow-up to EDL 641 in preparing school leaders to incorporate and maximize benefits from the utilization of local, community and Web-based educational and human services to the learning of school community members. Future school leaders will also explore how the school itself may offer resources and activities to connect with and meet the learning needs of stakeholders (e.g., computer training and access, parenting resources, etc.).

643. **Community Resources Workshop**. **1 credit hour** Teaching-learning resources available in the local community.

660. **Administration Leadership I. 3 credit hours** Practical applications in organizational management and leadership behavior.

685. **Workshop in Administration and/or Supervision**. Field workshop. **1-3 credit hours.**

691. **Practicum in Educational Leadership**. Field work on practical problem on project. Prerequisite: 9 hours in educational leadership at UAB. **3-6 credit hours.**

692. **Individual Readings in Educational Leadership**. Prerequisite: Permission of instructor. **1, 3, 6 credit hours.**

694. **Seminar in Educational Leadership I . 1-3 hours.**
This course is a review of selected concepts and competencies in the field of educational leadership. The course is designed for the personal and professional development of pre-service and in-service school leaders.

695. **Seminar in Community Education**. **1-3 hours.**
This course is a review of selected concepts and competencies in the field of educational leadership especially as it applies to utilizing community and Web-based resources to enhance adult and student learning, and in offering school resources for the purpose of addressing and enhancing community stakeholder learning needs. The course is designed for the personal and professional development of pre-service and in-service school leaders.

696. **Practicum in Community Education. 3-6 hours.**
This course provides practical experience and support for educational leaders pursuing specialized knowledge and field-based experience in establishing and nurturing school and community relations to address and enhance adult and student learning for school and community members.

*698. **Non-Thesis Research in Education Leadership**. **1, 3, or 6 hours.** This course provides support for the design and conduct of research and the preparation of a culminating thesis document for studies in educational leadership.

*699. **Thesis Research**. 1-6 **credit hours** Prerequisites: Admission to candidacy and 9 hours in educational leadership. An exploration of the relationship among concepts, generalizations, and theoretical models found in the behavioral and social sciences. The application of these to administrative practice in educational settings is addressed.

706. **Current Issues in Community Education**. **3 credit hours** This course provides an in-depth study of adult and community education principles. Students explore philosophical and historical context in relation to current programs and processes.

707. **International Aspects of Community Education**. **3 credit hours** Comparative analysis of community education worldwide.

708. **Administrative Leadership II**. **3 credit hours** This course is a survey of selected theoretical and operational bases for ethical decision making and leadership in an organizational setting with an emphasis on the school environment.

709. **Theories of Educational Leadership**. **3 credit hours** Concepts and theoretical bases for practice in educational administration and supervision.

711. **Collaborative Problem Solving** (Teacher Leadership Program) **3 credit hours** Strategies to create effective professional learning communities are provided to candidates in this class. These include: collaboration models, effective listening and questioning skills, mentoring/coaching models and parent and community partnerships.

EDL711L and EDL 711R Field Experiences for Collaborative Problem Solving-
These one hour field experiences are designed to provide Ed. S. candidates authentic practical experience in leading in a school. A minimum of 20 hours of field experience, spent in leadership activities correlating to the core course, at the school site, will be

required as the field experience . The Field Experience Course is taken concurrently with the core course. **1 hour credit.** Per session.

712**. School System Administration**. **3 credit hours** Instructional, managerial, and political roles of the superintendent and central office staff in school system organization and governance.

713. **Leadership of Special Education Programs**. **3 credit hours** Comprehensive study of organization and leadership of special education programs; role of special education administrator, processes and structures for delivery of services to exceptional students.

714. **Advanced School Business Management**. **3 credit hours** Local and state fiscal arrangements; current school budgetary practices; and related financial procedures.

715. **Non-Thesis Research in Educational Leadership**. **1-6 credit hours** Individual research on significant problem or development in educational leadership; proposed research plan must be approved by faculty member supervising the research.

716. **Workshop in Administration and/or Supervision**. Field workshop. **1-3 credit hours.** Studies to assist students in understanding school administration and/or supervisory responsibilities. Practical applications in educational administration and supervision are provided to enhance knowledge, skills, and dispositions in school leadership.

717. **Leading Change Through Action Research**. The purpose of this course is to strengthen knowledge and skills in the areas of effective leadership and systemic organizational change. The background knowledge for leading change is the presentation of 12 realities about people and organizations, as outlined in J. Patterson's book *Coming Even Cleaner About Organizational Change.* Based on these realities, this course will teach participants the skills and strategies to prepare for and introduce change in their schools through an identified school-based problem solving project. Candidates will be required to lead a collaborative effort of analyzing and applying strategies and quality tools in addressing a school-based problem, preferably one that is impacting student achievement. Course content will include: an introduction to quality tools (TQM), shared decision-making, group processes, effective teaming, and using data to make decisions. **3 hours credit.**

717L. **Field Experience for Leading Change Through Action Research**. The course is designed to give Ed.S. candidates authentic, practical experience in leading in a school. A minimum of 20 hours of field experience, spent in leadership activities correlating to the core course, at the school site, will be required as the field experience for EDL 717-L. the Field Experience Course is taken concurrently with the core course. **1 hour credit.**

718. **Essential Skills for Organizational Leaderhsip**. This course is designed to strengthen knowledge and skills essential to effective leadership in the school setting. Candidates will increase their understanding of and skills in utilizing participatory /shared decision making; using data focused on student learning to drive the decision making process; communicating high expectations for student learning; and enhancing human resource development. Candidates will demonstrate the ability to analyze various situations involving community and stakeholder relationships through the structural, human resource, political, and symbolic frames and devise appropriate courses of action based on this analysis of school programs. **3 hours credit.**

718L. **Field Experience for Essential Skills for Organizational Leadership**. The course is designed to give Ed.S. candidates authentic, practical experience in leading in a school. A minimum of 20 hours of field experience, spent in leadership activities correlating to the core course, at the school site, will be required as the field experience for EDL 718-L. The Field Experience Course is taken concurrently with the core course. **1 hour credit.**

719. **Mentoring & Coaching Skills for School Leaders**. In an era of ensuring highly qualified teachers through embedded, research-based staff development, the role of supervision and mentoring has taken on an unprecedented role in successful schooling. Supervision and mentoring are at the “heart” of schooling. In addition, future school leaders need to understand their own mentoring needs, and be comfortable with seeking a mentor for themselves. In this course, candidates will conduct a comprehensive critical examination of mentoring concepts, both for personal development and for instructional supervision of classroom teachers. The skills of supervision through cognitive coaching will be learned and practiced. Implications for individual and group development and the improvement of instruction are emphasized. The field experience, EDL 719L will involve candidates seeking a mentor for themselves, as well as engaging in mentoring a new teacher. **3 hours credit.**

719L. **Field Experience for Mentoring & Coaching Skills for School Leaders**. The course is designed to give Ed.S. candidates authentic, practical experience in leading in a school. A minimum of 20 hours of field experience, spent in leadership activities correlating to the core course, at the school site, will be required as the field experience for EDL 719-L. the Field Experience Course is taken concurrently with the core course. **1 hour credit.**

720. **Field Project in Educational Leadership**. Field work on practical problems and projects in educational leadership; plan for actual project must be approved in advance by faculty member supervising the work. **1-6 hours.** (In the doctoral program of study, this is the Proposal Writing Course).

721. **Administration of Staff Personnel**. **3 credit hours** Personnel administration in public education; practices, problems, and current developments.

722. **Current Issues in Educational Leadership**. **3 credit hours** Prerequisites: Graduate standing and permission of instructor. This course examines current trends and issues related to educational leadership. Students increase their capacity for analyses of issues and challenges affecting decision-making and instructional practice.

723. **Administration of Educational Programs and Services**. **3 credit hours** Development, implementation, and evaluation of educational programs. Primarily for Ed.S. students continuing their preparation principalship.

724. **Seminar in Educational Leadership I and II**. **1-3 credit hours.** This course is a review of selected concepts and competencies in the field of educational leadership. Designed for the personal and professional development of school leaders.

726. **Advanced Clinical Supervision for Administrators and Supervisors**. **3 credit hours** In-depth study of competence needed by administrators and supervisors providing leadership in improvement of instruction.

727. **Leading the Adult Learning Community**. This course is divided into the following conceptual units: a) Teachers as Adult Learners; b) Understanding Adult Learning Theories; c) Applying Adult learning Theories to Professional Learning Communities; d) Creating Collaborative Teams to support learners; e) Shared Leadership to improve academic achievement of diverse learners; f) Developing and Utilizing Shared Leadership Strategies. The purpose of this course is to prepare candidates with the ability to and the knowledge of skills and strategies required to Lead the Adult Learning community in schools. An in-depth analysis of adult learning theories and strategies to develop shared leadership capacity in school communities will provide the impetus of this course. Candidates will learn about characteristics of adult learners and various theories of how adults learn, develop, and interact in professional learning communities. The second focus of this course is how to develop and implement shared leadership in schools. **3 hours credit.**

727L. **Field Experience for Leading the Adult Learning Community**. The course is designed to give Ed.S. candidates authentic, practical experience in leading in a school. A minimum of 20 hours of field experience, spent in leadership activities correlating to the core course, at the school site, will be required as the field experience for EDL 727-L. the Field Experience Course is taken concurrently with the core course. **1 hour credit.**

728. **Management of the Learning Organization**. The purpose of this course is to strengthen knowledge of and skills in essential management functions within the school or district setting, as noted in specified ISLLC and Alabama Administrative Code Standards. The course will focus on practices and procedures that are vital to the efficient and effective operation of a school or a school district. **3 hours credit.**

728L. **Field Experience for Management of the Learning Organization**. The course is designed to give Ed.S. candidates authentic, practical experience in leading in a

school. A minimum of 20 hours of field experience, spent in leadership activities correlating to the core course, at the school site, will be required as the field experience for EDL 728-L. The Field Experience Course is taken concurrently with the core course. **1 hour credit.**

729. **Advanced Research in Educational Leadership**. Field or basic research. **1, 3, or 6 hours.** Research and evaluation in education with emphasis on development of skills required for advanced research in educational settings.

730. **Advanced Focus on the Principalship**. **3 credit hours** Advanced knowledge and skills related to school leadership.

731. **Law, Ethics, and Policy for Educational Leaders**. The purpose of this course is twofold: 1) Candidates will gain a fundamental knowledge of ethical principles based on the Alabama Educator Code of Ethics and the guidelines of the State Ethics Commission. 2) Candidates will gain a working knowledge of legal principles established by local, state, and federal legislative and judicial requirements. Candidates will be able to demonstrate an understanding of legal and ethical principles related to underrepresented populations within the school setting. Candidates will be able to demonstrate a knowledge and application of the ethical principles stipulated in the Alabama Educator Code of Ethics and accompanying legal precepts. Candidates' ability to make sound legal and ethical decisions will be enhanced through a better understanding of board policies and politics as well as through reflection on and clarification of personal values and beliefs. **3 credit hours.**

731L. **Field Experience for Law, Ethics, and Policy for Educational Leaders**. The course is designed to give Ed.S. candidates authentic, practical experience in leading in a school in the area of law, ethics, and policy. A minimum of 20 hours of field experience, spent in leadership activities correlating to the core course, at the school site, will be required as the field experience for EDL 731-L. The Field Experience Course is taken concurrently with the core course. **1 hour credit.**

EDL 732. **Leadership of Special Programs**. Leadership of Special Programs coalesces the knowledge of and ability to lead special programs within a school site. Candidates will apply leadership skills in developing a comprehensive home school collaborative project and a comprehensive technology integration project. In addition, candidates will develop curriculum which will align state standards unique to career and technical education. Emphasis will be placed on models of communication, problem solving, conflict resolution and team building principles and skills. Focus will also be placed on best practices in the development of community information, networking, public relations, and media. The technology portion of this class will focus on the total integration of technology into a school community. **3 credit hours.**

EDL 732L. **Field Experience for Leadership of Special Programs**. The course is designed to give Ed.S. candidates authentic, practical experience in leading in a school. A minimum of 20 hours of field experience, spent in leadership activities correlating to

the core course, at the school site, will be required as the field experience for EDL 732-L. The Field Experience Course is taken concurrently with the core course. **1 hour credit.**

746. **Practicum in Instructional Leadership**. Course required in the Ed.S. program for candidates who completed the Class A Administrative Certification before 2009, before program redesign].The course content consists of the Practicum activities chosen by the candidate from the menu of Critical Leadership Activities from the Practicum Handbook. The candidate will be required to have a mentor (the same one as for all coursework) and the mentor will assist the candidate in selecting meaningful leadership experiences. Candidates will conduct leadership activities at any time during the four semesters of the Ed.S. program. Where possible, candidates should acquire experiences in diverse settings. The experiences may be conducted at the elementary, middle school, high school, or central office level. **1 credit hour.**

EDL 735 Professional Leadership 3 credit hours (Teacher Leadership Program) An in-depth look at School law and policy, ethics, school finance and lifelong learning based on Erik Erickson's theory will provide the foundation for this class.

EDL 735L and EDL 735 R Field Experiences The course is designed to give Ed.S. candidates authentic, practical experience in leading in a school. A minimum of 20 hours of field experience, spent in leadership activities correlating to the core course, at the school site, will be required as the field experience for EDL 735-L. The Field Experience Course is taken concurrently with the core course. **1 hour credit per session.**

748. **Current Issues and Problems in School Administration**. **3 credit hours** Prerequisite: Admission to doctoral studies.

752. **Advanced Educational Planning**. **3 credit hours** This course provides an in-depth analysis of strategies and techniques used by Central Office Leaders to project future growth trends in school districts. Problem-based learning will be infused in this class as candidates develop skills to support growing and declining school districts.

755. **Advanced School System Administration**. **3 credit hours** Duties and responsibilities of the superintendent and other Central Office Personnel are explored in this course. This is a survey course which provides an overview of leadership beyond a school site principal-ship. Prerequisite: Admission to doctoral studies.

756. **Current Legal Problems in Alabama Education**. **3 credit hours** Prerequisite: Admission to doctoral studies. This course explores legal challenges of education in Alabama. Finance, immigration, higher education, and taxation are topics which will be discussed in this course.

762. **Futurism in Community Education**. **3 credit hours** How do current trends in community development impact education? Rural, urban, and suburban communities

share the common tenets of education. This class will explore the hopes and challenges of each type of community as they seek a road to the future and empowering members of their community. Prerequisite: Admission to doctoral studies.

770. **Advanced Administrative Leadership**. **3 credit hours** This course will provide an in-depth analysis of leading diverse school populations. The role of leadership teams in creating supportive inclusive environments in the 21st century will be infused throughout the course offering.

772. **Advanced Technology of Educational Planning**. **3 credit hours** Prerequisite: Admission to doctoral studies. This class reviews the use of technology in curriculum development and implementation. Current trends in technology will be discussed, explored, and implemented through problem based learning.

792. **Directed Study in Educational Leadership**. **3 credit hours** Prerequisites: Admission to doctoral studies and advance permission of instructor. This course provides independent directed research study opportunities for doctoral students.

796. **Individual Readings in School Law**. Prerequisite: Admission to doctoral studies. **3-6 credit hours**. This class is an in-depth analysis of educational readings related to the law. Candidates will assess case law related to district school law rulings.

797. **Doctoral Internship in Educational Leadership**. Field leadership experience. Prerequisite: Admission to doctoral studies. **1-12 credit hours**. Candidates will conduct research related to their approved final project.This course provides practical experience and support for field based advanced research on school based problems.

*798. **Non-Dissertation Research**. Prerequisite: Admission to doctoral studies. **1-12 credit hours.** This class introduces and connects doctoral students to the steps of moving into candidacy. Guidelines for developing the first three chapters of the prospectus are infused throughout this class.

*799. **Dissertation Research**. Prerequisites: Prerequisite: Admission to doctoral studies, admission to candidacy, and permission of faculty advisor. **1-12 credit hours**. The purpose of this course is to provide independent research guidance for doctoral candidates as they move through the dissertation process.

University of Alabama (Tuscaloosa) Courses Offered at UAB in the Joint Doctoral Program in Educational Leadership

AEL 602. **Advanced Educational Leadership**. Basic concepts, group interaction on selected presentation of assigned research. 3 credit hours

AEL 650. **Organizational Theory**. 3 credit hours.
This course provides an in-depth review of organizational theories. Candidates will assess how and if these theories affect their school site. Case studies which support problem based learning will be part of the curriculum.

UAB Courses Offered for the Joint Doctoral Program

EDL 770– Advanced Administrative Leadership. 3 credit hours

This course will provide an in-depth analysis of leading diverse school populations. The role of leadership teams in creating supportive inclusive environments in the 21st century will be infused throughout the course offering.

EDF 708 – Ethics in Advanced Leadership 3 credit hours

This course is a survey of selected theoretical and operational bases for ethical decision making and leadership in an organizational setting with an emphasis on the school environment.

Health Education Overview of Our Programs

The Health Education program at the University of Alabama at Birmingham prepares professionals for a variety of careers in health education. At the *master's level,* students acquire advanced knowledge and skills which enable them to enter professions in community, clinical, worksite and agency settings *(M.A.Ed., Community Health).* Students may complete requirements to earn a certificate in Clinical Research Management AND the M.A.Ed. in Community Health. The certificate program is a collaboration between the Department of Human Studies and the School of Nursing (M.A.Ed., Community Health with CRM certificate). The department also offers a Graduate Traineeship in Pediatric Pulmonary Care (with School of Health Professions), designed specifically for professionals desiring a graduate degree in Health Education (master's or doctorate), who are interested in pediatric pulmonary care, and aspiring to positions of leadership. PhD graduates become leading researchers, clinicians and faculty in higher education, government agencies and foundations.

M.A.Ed. – Community Health

The Health Education program at the University of Alabama at Birmingham prepares professionals for a variety of careers in health education. Students acquire advanced knowledge and skills which enable them to enter professions in community, clinical, worksite and agency settings.

M.A.Ed. Admission Process

Consideration for admission to the master's degree program will occur each Fall and Spring term. The completed application packet must be received by the Health Education Program from the Graduate School by the dates shown:

Term	***Deadline***
Fall	April 30
Spring	October 30

Admission to graduate study in health education is initiated through the Graduate School and all required materials are to be submitted per specified instructions delineated by the Graduate School. M.A.Ed. applicants should have a cumulative GPA of 2.50/4.00 or greater for prior college coursework and preferred MAT score of 40 or greater, *or* preferred GRE scores of 150 or greater for Verbal Reasoning and 149 or greater for Quantitative Reasoning. In rare cases, applicants who do not meet these standards may be considered for admission if the faculty determines the candidate brings something unique to the learning community.

In addition, applicants must include a typewritten statement of professional purpose that reflects the applicant's background, development, pertinent work-related experience, professional career

objectives and specified ways that completion of this program will contribute to his/her goal for becoming a health education professional.

All applications for graduate admission are reviewed by the health education faculty. Applicants deemed to meet requirements will be contacted for an interview with the Admissions Committee. Applicants should not infer they have been admitted into the program if granted an admissions interview. Selection will be made by the faculty after reviewing the applicant's credentials in their entirety, and some candidates meeting minimum requirements may not be admitted. Candidates participating in the interview may be given one of two decisions: a) admit, or b) not admit. Students are notified of their admission status following the interview.

Programs of Study for Master's Degrees (Program Coordinator, Dr. Retta Evans, rrevans@uab.edu)

The M.A.Ed. in Community Health is designed to prepare individuals for advanced health education careers in agency, schools, worksites, and allied health care settings. This program is aligned with the National Commission for Health Education Credentialing and prepares students to sit for the CHES/MCHES certification. CHES/MCHES provides evidence of competency of the knowledge, skills and application of the Areas of Responsibilities defining the role of an entry or masters-level health educator. Program options allow students to select thesis, non-thesis, or Clinical Research Management certificate as options. A Graduate Traineeship in Pediatric Pulmonary Care is designed specifically for professionals desiring a graduate degree in Health Education, who are interested in pediatric pulmonary care, and aspiring to positions of leadership.

M.A.Ed. – Community Health, Thesis Option. Thesis required (33 hours course work required)

NOTE: No individual course grade below "C" will be accepted. Each course with a grade below "C" must be repeated.

MAJOR COURSES (21 hours)

HE 610 Foundations of Health Education (pre or co requisites HE 223, HE 343 or equivalent coursework)
HE 606 Issues in Disease Control (Prerequisite: EPR 607/608 or equivalent course)

HE 631 Planning and Implementing Health Education/Promotion Programs (Prerequisite: HE 610)
HE 632 Administration of Health Education Programs (Prerequisite: HE 610)

HE 642 Health Behavior and Health Education (Prerequisite HE 610)
HE 689 Methods and Materials for Planning Health Education Programs (Prerequisite: HE 610)
HE 697 Evaluation of Health Education Programs (Prerequisite: HE 610)

ADDITIONAL REQUIREMENTS

Students must have these courses or equivalents, or take them with HE 610:

HE 223 Introduction to Epidemiology and Disease Impact (pre or co requisite with HE 610)
HE 343 Theories and Determinants of Health Behavior (pre or co requisite with HE 610)

RESEARCH COURSES (6 hours)

EPR 609 Statistical Methods and Research in Education: Intermediate. Prerequisite: EPR 608
EPR 692. Introduction to Educational Research Design

THESIS (3 hours)

GRADUATE ELECTIVE (3 hours) MUST be approved by a health education advisor

M.A.Ed. – Community Health, Non-Thesis Option (33 hours course work required.)

NOTE: No individual course grade below "C" will be accepted. Each course with a grade below "C" must be repeated.

MAJOR COURSES (21 hours)

HE 610 Foundations of Health Education (pre or co requisites HE 223, HE 343 or equivalent courses)
HE 606 Issues in Disease Control (Prerequisite: EPR 607/608 or equivalent course)

HE 631 Planning and Implementing Health Education/Promotion Programs (Prerequisite: HE 610)
HE 632 Administration of Health Education Programs (Prerequisite HE 610)

HE 642 Health Behavior and Health Education (Prerequisite HE 610)
HE 689 Methods and Materials for Planning Health Education Programs (Prerequisite: HE 610)
HE 697 Evaluation of Health Education Programs (Prerequisite HE 610)

ADDITIONAL REQUIREMENTS Students must have these courses or their equivalents, or take them with HE 610:

HE 223 Introduction to Epidemiology and Disease Impact (pre or co requisite with HE 610)
HE 343 Theories and Determinants of Health Behavior (pre or co requisite with HE 610)

RESEARCH COURSES (6 hours)

EPR 609 Statistical Methods and Research in Education: Intermediate. (Prerequisite EPR 608)
EPR 692. Introduction to Educational Research Design

Graduate Elective (3 hours). Must be approved by a health education advisor.

HE 693 Internship (3 hours)

Comprehensive Examination Non-Thesis Option Only

Students in the Non-Thesis M.A.Ed. program must complete a supervised internship including comprehensive exams during their last semester of course work. The examination process is intended to allow students to demonstrate the appropriate aptitude for advanced level health education. The process encompasses the content knowledge and critical thinking skills that Health Education faculty believes every student graduating from this program should possess. A student cannot attempt the internship and comprehensive exam more than twice. Those who cannot complete the internship and exam with a passing score during the second attempt will be dismissed from the program and not allowed readmission. Contact your health education academic advisor for further information.

MAJOR COURSES for Clinical Research Management Certificate option with Internship (42 hours)

IMPORTANT NOTES:
No course grade below "C" will be accepted. Each course with a grade below "C" must be repeated. Undergraduate coursework in Epidemiology (HE 223 or equivalent course), and Theories and Determinants of Health Behavior (HE 343 or equivalent course) are program prerequisites.

REQUIRED COURSES - Certificate in Clinical Research Management:

1. CRM 670Q Clinical Research Ethics, Methods and Clinical Trials
2. CRM 671Q Clinical Research Study Operations and Site Management
3. CRM 673Q Current Issues in Clinical Research Management

REQUIRED COURSES - Community Health Education:

1. HE 610 Foundations of Health Education (3)
2. HE 606 Issues in Disease Control (3) (Prerequisite: EPR 607/608 or equivalent course)

3. HE 631 Planning and Implementing Health Education Programs (3) (Prerequisite: HE 610 or equivalent course)
4. HE 632 Administration of Health Education Programs (Prerequisite: HE 610 or equivalent course)
5. HE 642 Health Behavior and Health Education (3) (Prerequisite: HE 610 or equivalent course)
6. HE 689 Methods and Materials for Planning Health Education Programs (3) (Prerequisite: HE 610 or equivalent course)
7. EPR 692 Introduction to Educational Research (3) (Co-requisite: EPR 607/608 or equivalent course)
8. HE 697 Evaluation of Health Education Programs (3) (Prerequisite: HE 610 or equivalent course, EPR 607/608 or equivalent course)
9. EPR 609 Statistical Methods and Research in Education (3) (Prerequisite: EPR 607/608 or equivalent course or successful mastery of a qualifying examination)
10. CRM 674Q Practicum Experiences in Clinical Research Management (3)
11. HE 693 Advanced Field Experiences in Health Education (3)

Comprehensive Examination: Students in the non-thesis option must complete a supervised internship (HE 693) including comprehensive exams during their last semester of course work. A student cannot attempt the internship and comprehensive exam more than twice. Those who cannot complete the internship and exam with a passing score during the second attempt will be dismissed from the program and not allowed readmission. Contact your health education academic advisor for further information.

MAJOR COURSES for Clinical Research Management Certificate option with Thesis (42 hours)

IMPORTANT NOTES:
No course grade below "C" will be accepted. Each course with a grade below "C" must be repeated. Undergraduate coursework in Epidemiology (HE 223 or equivalent course), and Theories and Determinants of Health Behavior (HE 343 or equivalent course) are program prerequisites.

REQUIRED COURSES - Certificate in Clinical Research Management:
1. CRM 670Q Clinical Research Ethics, Methods and Clinical Trials
2. CRM 671Q Clinical Research Study Operations and Site Management
3. CRM 673Q Current Issues in Clinical Research Management

REQUIRED COURSES - Community Health Education:
1. HE 610 Foundations of Health Education (3)
2. HE 606 Issues in Disease Control (3) (Prerequisite: EPR 607/608 or equivalent course)
3. HE 631 Planning and Implementing Effective Health Education Programs (3) (Prerequisite: HE 610 or equivalent course)

4. HE 632 Administration of Health Education Programs (Prerequisite: HE 610 or equivalent course)
5. HE 642 Health Behavior and Health Education (3) (Prerequisite: HE 610 or equivalent course)
6. HE 689 Methods and Materials for Planning Health Education Programs (3) (Prerequisite: HE 610 or equivalent course)
7. EPR 692 Introduction to Educational Research (3) (Co-requisite: EPR 607/608 or equivalent course)
8. HE 697 Evaluation of Health Education Programs (3) (Prerequisite: HE 610 or equivalent course, EPR
607/608 or equivalent course)
9. EPR 609 Statistical Methods and Research in Education (3) (Prerequisite: EPR 607/608 or equivalent course or successful mastery of a qualifying examination)
10. CRM 674Q Practicum Experiences in Clinical Research Management (3)
11. HE 699 Thesis (3)

GRADUATE TRAINEESHIP IN PEDIATRIC PULMONARY CARE (with School of Health Professions)

The traineeship features a combination of planned coursework, hospital rounds, pulmonary clinics, patient and family education and research experience and is designed specifically for professionals desiring a graduate degree in Health Education (master's or doctorate), who are interested in pediatric pulmonary care, and aspiring to positions of leadership. This 12-month interdisciplinary training program is offered to graduate students in Respiratory Therapy - Health Education, nursing, nutrition, social work and medicine. Training is provided in each of the Maternal and Child Health Leadership Competencies. The Traineeship includes a monthly stipend (for up to 12 months) and tuition assistance (limited to U.S. citizens or to individuals with a permanent visa). For further information, contact Heather Hathorne, Pediatric Pulmonary Center Faculty Respiratory Therapist, 205-638-9568.

Student Professional Dispositions

Health Education faculty individually review the professional dispositions (behaviors and attitudes) of students within each course in accordance with the School of Education's policy and procedure. Additionally, faculty will collectively review student dispositions and overall progress in the program at the end of each semester. Dispositional areas identified as deficient could result in termination from the program.

Graduate Program Policies

No individual course grade below "C" will be accepted. Each course with an earned grade below "C" must be repeated. Repeating a required health education course more than twice is not permitted. If a student receives a grade lower than a "C" after their second attempt, they will be dismissed from the Health Education program and not allowed readmission.

Non-Degree Seeking Graduate Students

Following admission to the UAB Graduate School, students may enroll in elective Health Education courses as "non-degree seeking" students with the permission of the instructor. Non-degree seeking students are limited to 12 hours of coursework. It is essential for non-degree seeking students to make an advising appointment with a faculty member prior to enrolling in elective courses as some elective courses have pre-/co-requisites. Non-degree seeking students are <u>not</u> permitted to take "core" health education courses prior to admission. Enrolling and passing non-degree seeking coursework <u>does not</u> guarantee admission into a masters or doctoral degree program. Admission criteria (e.g., test scores, cumulative GPA, recommendations, and interview) are the primary factors considered when reviewing student suitability for admission to a program.

Health Education/Health Promotion (PhD)

Graduate Program Director (Education): Dr. Brian Geiger, bgeiger@uab.edu

Ph.D. Health Education/Health Promotion

The PhD in Health Education/Health Promotion is a UA System degree jointly administered by three units: UAB School of Education and College of Arts & Sciences, UAB School of Public Health, and UA College of Human Environmental Sciences. Students draw upon the expertise and resources of a diverse and highly qualified faculty. Faculty members strive to create a rigorous scholarly and supportive atmosphere for students to develop intellectually with the knowledge, skills and attitudes necessary to be ethical and responsible health education professionals.

Ph.D. Admission Process

Consideration for admission to graduate study in health education will occur each Fall and Spring term. The completed application packet must be received by the Health Education Program from the Graduate School by the dates shown:

Term	***Deadline***
Fall	April 30
Spring	October 30

Candidates for admission must have completed a bachelor's or master's degree from an accredited institution in health education or a health-related field. Admission to doctoral study is initiated through the Graduate School. Applicants will: (a) request official transcripts of all college coursework to send to UAB Graduate School; (b) submit (3) letters of recommendation from professors or others who are qualified to judge your ability to complete doctoral coursework; (c) complete the GRE indicating UAB as the recipient of your scores; and (d) submit writing sample(s), such as an essay describing your academic training, professional experiences and career goals, or scholarly papers presented during professional meetings. Admission to the program is competitive.

Ph.D. applicants should have a cumulative GPA of 3.00/4.00 or greater for prior college coursework and preferred GRE scores of 156 or greater for Verbal Reasoning and 156 or greater for Quantitative Reasoning. Faculty consider GRE scores as one indicator of an applicant's potential success in the doctoral program.

Ph.D. Health Education/Health Promotion Program of Study

The PhD degree program through the School of Education will require students to complete a minimum of 72 credit hours: 36 hours of coursework, 12 hours of research internship, and 24 hours of dissertation research.

Students may enter the program with either a bachelor's or master's degree in health education, or a master's degree in a closely related health field. Prerequisite coursework includes Foundations of Health Education, Administration of Health Education, Health Education Planning and Evaluation, Health Education Methods, Materials and Delivery, and Research Design and Statistics. These requirements may be corequisite components in the program.

Students entering the program with a master's degree may transfer appropriate coursework to this program; however, this will not reduce the number of courses required. Students will not be required to retake coursework already completed but may be required to complete prerequisites as part of their planned course of study.

A required review of student credentials prior to admission will identify strengths and needs. This review will provide students with a blueprint for their course of study and will be conducted by the program director and faculty advisor.

The PhD degree program will require students to complete a minimum of 72 credit hours: 36 hours of coursework, 12 hours of research internship, and 24 hours of dissertation research. Students will meet regularly with a faculty advisor to plan course enrollment.

The specific components of the PhD program in health Education and Health Promotion are outlined below.

Ph.D. through the School of Education

(UA = HHE, UAB-Public Health = HB, UAB-Education = HE)

I. Health Education and Promotion Courses

A. Advanced Theoretical and Scientific Bases of Health Education	**3 hr**
and Health Promotion (HHE 605, HB 750, HE 705)	
B. Health Communications Research (HHE 607, HB 730, HE 701)	
C. Planning and Administration of Health Education and Health Promotion (HHE 606, HB 760, HE 710)	**3 hr**
D. Doctoral Studies Seminars (HHE 604, HB 770, HE 700) taught during	
3 consecutive terms, 1.0 hr each Seminar	
	12 hr
II. Advanced Research and Statistical Methods	
A. Multivariate/Multiple Regression Analysis	**3 hr**
B. Advanced Epidemiological Research Methods	**3 hr**
C. Data Management/Computer Technology	**3 hr**
D. Evaluation/Research Methods	**3 hr**
Subtotal	**12 hr**
III. Coursework in the Social and Behavioral Sciences Minor	**12 hr**
Selection of courses pre-approved by doctoral program advisor to build knowledge and skills in a cognate area, e.g, Health Disparities Research, Global Health, Public Health Policy, Aging and Health, Disabilities and Health	
IV. Research Internship	**12 hr**
V. Dissertation	**24 hr**

Comprehensive Examination

A written comprehensive examination is required of all candidates for the Ph.D. degree. Your preparation will include studying course content, core competencies for the profession, and related literature of the discipline. Prior to taking the exam, students must have completed their core course requirements, and at least 75% of their other course work. Students must register for a minimum of

3.0 hours of graduate work during the semester(s) in which the comprehensive exam is taken.

The Comprehensive exam will be offered twice each year and is written and graded by the graduate faculty in the joint doctoral program. The examination will be a synthesis of the core coursework as well as core competencies in the field of Health Education and Health promotion. Grading of the comprehensive exam is done blinded, and by consensus. Students who fail to achieve passing scores will have one attempt to remediate within a calendar year. If a student fails a section for the second time, they will be dismissed from the program.

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit.

Health Education – HE

HE 502. Mental Health and Stress Management (online course). Stress process and its relationship to individual wellness and total health. Physical and psychological effects of stressors and individual appraisals using theoretical models and practical examples will be explored. 3 hours.

HE 508. Drug Use and Abuse (online course). Concept of addiction and its manifestation and causes in modern society and among diverse populations. Major drug classifications and effects will also be discussed. 3 hours.

HE 523. Human Sexuality (online course). Biological, sociological and cultural aspects of sexuality. 3 hours.

HE 601. Current Readings in Health Education. Review of literature in health education. Development of annotated bibliography pertinent to professional practice. Prerequisite: Permission of advisor. 1 to 3 hours.

HE 606. Issues in Disease Control. Nature and distribution of disease; communicable and nutritional diseases of childhood; public health strategies for prevention. 3.0 sem. hours. 3 hours.

HE 610. Foundations of Health Education. Issues in health education; school, community, or patient health education. 3 hours.

HE 621. Health Communication. Skills appropriate for selected health problems; social marketing and health communication strategies to reach various populations. 3 hours.

HE 623. Human Sexuality. Biological, sociological, and cultural aspects of sexuality. 3 hours.

HE 631. Planning and Implementing Effective Health Education and Promotion Programs. Program planning and curriculum development for school, agency, and health care settings. Need assessment, objective setting, methodology, and evaluation are emphasized. 3 hours.

HE 632. Administration of Health and Fitness Programs. Administrative theory applied to health and fitness settings. 3 hours.

HE 640. Content Issues I. Selected health topics, e.g. drugs, death, human sexuality, nutrition, international health, legislation, and physical and spiritual dimensions of health. Decision making and problem solving. Implication of research, computer applications. 3.0 hours.

HE 641. Content Issues II. Selected health issues. Personal characteristics of population (age, sex, emotional well-being) and external factors (societal and environmental); interventions and other approaches and solutions. Prerequisite: Admission to graduate program in HE and permission of instructor. 3 hours.

HE 642. Health Behavior and Health Education. Examination of theories and models that assist health educators to increase healthy behaviors of youth and adults. Opportunities to apply what you have learned to assist others with healthful actions. Determinants of successful client-professional relationships (acceptance of cultural differences, active communication, thorough preparation, appropriate modifications, and shared responsibility for outcomes). Prerequisite: HE 610. 3 hours.

HE 689. Materials and Methods of Health Education. Ethical, theoretical, and practical aspects of health education; teaching techniques, decision-making skills, curricular development, organization skills, and techniques. Prerequisites: HE 342, 431, 434, and 489. 3 hours.

HE 691. Special Topics in Health Education. Topics in school and community health education; development of new ways to examine situations. Prerequisite: Completion of HE core courses. 3 or 6 hours.

HE 691. Special Topics in Health Education – *Pediat. Pulmonary Patient Educ.* Students will: complete a minimum of 16 hours of approved PPC clinical experiences weekly including group lectures, resident team rounds, neonatal pulmonary rounds, and MDA/asthma camp, when available; plan and implement training activities together with PPC faculty, clinic director, and health education advisor; submit a weekly time sheet including narrative summary of specific clinical experiences completed during the academic term. 3.0-6.0 sem. hours.

HE 692. Supervised Research in Health Education. Research problem based on school, community, or public health education needs. Prerequisite: Permission of advisor and EPR 508 or 509. 3 or 6 hours.

HE 693. Advanced Field Experience. Professional practice and research supervised by qualified health education professionals in approved health education work setting. 3 or 6 hours.

HE 697. Evaluation of Health Education Programs. Competencies, knowledge and skills to plan and to implement an evaluation of health promotion-disease prevention intervention for a defined population at risk. 3 hours.

HE 698. Non-Thesis Research. 1-6 hours.

HE 699. Thesis Research. Supervised research project. Prerequisite: Admission to candidacy and permission of advisor. 1, 2, 3, or 6 hours.

HE 700. Seminar in Health Education. Presentation of health education research. 1 to 3 hours.

HE 701. Special Topics in Health Education. Topics in school and/or community health education; development of new ways to examine situations. Prerequisite: Permission of advisor. 3 or 6 hours.

HE 702. Supervised Research in Health. Research problem based on school, community, or public health education needs. Prerequisite: Permission of advisor. 3 or 6 hours.

HE 703. Advanced Field Experience. Professional practice and research supervised by qualified health education professionals in approved health education work setting. 3 or 6 hours.

HE 705. Advanced Theoretical and Scientific Basis of Health. Analysis of knowledge, attitude and behavior change strategies, and resulting effect on health status. 3 hours.

HE 710. Planning and Administration of Health Education/Health Promotion Programs. Three basic phases of comprehensive health education and promotion programs (planning, implementation and evaluation). Demonstrate competencies for a graduate-level health educator. Propose effective implementation and evaluation activities in practice settings (school, occupational, clinical and community agency). Different field experiences will be offered each year. Discussion of case studies selected from professional literature and health agencies. 3 hours.

HE 720. Evaluation of Health Education Programs. Evaluation protocols in health education settings; needs assessments, process and formative evaluations, cost benefits, summary reports. 3 hours.

HE 730. Evaluation Research Methods. Theory and application of behavioral evaluation research including preparation of research NIH type proposals. 3 hours.

HE 731. Health Education Planning and Promotion. 3 hours.

HE 732. Evaluation of Health Education Programs. 3 hours.

HE 740. Evaluation of Health Education Programs. 3 hours.

HE 798. Nondissertation Research. 3 or 6 hours.

HE 799. Dissertation Research. Prerequisite: Admission to candidacy. 1 to 12 hours.

Health Behavior - HB

HB 600. Social and Behavioral Science Core.- This course is structured to provide students with a basic "starting point" for developing the required competencies in this area. The course consists of information delivery (e.g., lectures, readings), practice and application exercises, and knowledge integration and synthesis activities. Successful completion of this course will enable you to describe the role of social and community factors in both the onset and solution of public health problems; identify the causes of social and behavioral factors that affect health of individuals and populations; identify basic theories, concepts and models; apply ethical principles to public health program planning, implementation and evaluation; specify multiple targets and levels of intervention; identify individual, organizational and community concerns, assets, resources and deficits; apply evidence-based approaches in the development and evaluation of interventions; describe the merits of social and behavioral science interventions and policies; describe steps and procedures for the planning, implementation and evaluation of public health programs; and identify critical stakeholders for the planning, implementation and evaluation of public health programs, policies and interventions. Course will be graded by letter. 3 hours

HB 600Q. **Social and Behavioral Science Core Online**. This course is structured to provide students with a basic "starting point" for developing the required competencies in this area. The course consists of information delivery (e.g., lectures, readings), practice and application exercises, and knowledge integration and synthesis activities. Successful completion of this course will enable you to describe the role of social and community factors in both the onset and solution of public health problems; identify the causes of social and behavioral factors that affect health of individuals and populations; identify basic theories, concepts and models; apply ethical principles to public health program planning, implementation and evaluation; specify multiple targets and levels of intervention; identify individual, organizational and community concerns, assets, resources and deficits; apply evidence-based approaches in the development and evaluation of interventions; describe the merits of social and behavioral science interventions and policies; describe steps and procedures for the planning, implementation and evaluation of public health programs; and identify critical stakeholders for the planning, implementation and evaluation of public health programs, policies and interventions. Course will be graded by letter. Course is offered online.

HB 602. Alcohol and Drug Abuse.-History and theory of human substance use and abuse. Empirical foundations of alcohol and drug abuse, diagnosis, assessment, treatment, and prevention. Course will be graded by letter.

HB 603. Behavioral Interventions for Cardiovascular Risk Reduction.- This course is designed to examine interventions that are used to decrease the risk of developing cardiovascular disease (CVD) by modifying health behaviors. The course will begin with a thorough review of the occurrence, etiology, and consequences of CVD among various subpopulations. This is followed by a systematic review of the literature on existing behavioral interventions to reduce health risks among various subpopulations. Based on this literature review, this course will conclude with the identification of key elements to the design of successful behavioral interventions to reduce the occurrence of CVD. Course will be graded by letter.

HB 604. High Technology Approaches to Health Communications and Behavior Change Interventions.- To present students with an initial, in-depth exposure to concepts, technical skills and research findings associated with the integration of computer technology and health communications. Course will be graded by letter.

HB 608. Women's health and Social Behavior. This course examines social and behavioral factors that adversely affect women's health. Students learn to apply gender specific theories to design health interventions tailored towards women. Course will be graded by letter.

HB 609. African-American Health Issues.- This is an intermediate-level course that focuses on: epidemiological data illustrating the health risks experienced by African-Americans; sociocultural factors essential for understanding and enhancing the health of African-Americans; effective health-related prevention programs for African-Americans. Course will be graded by letter

HB 610. Health Promotion/Disease Prevention: Advanced Theory and Practice.- This course is a comprehensive overview of methods used to develop health promotion and disease prevention programs. It focuses on understanding, synthesizing, and applying behavior change theories to public health program development and includes the critical review of existing assessment measurements, the development of theory-based measures and evaluation principles in the context of intervention development and implementation. Course will be graded by letter.

HB 611. Mental Illness as a Public Health Issue.-This course is designed to increase knowledge of mental illness at the individual, community, and population levels. It also covers historical and contemporary models and research on the etiology, diagnosis, assessment, treatment and prevention of mental and other behavioral health disorders. Course will be graded by letter.

HB 624. Advanced Theory and Practice in Behavioral Science.-Advanced review of selected behavioral science concepts and theories useful for developing health promotion programs; social cognitive theory and the transtheoretical model of change are examined in depth. This course may be required for some MPH- students. Course will be graded by letter. Prerequisite: HB 600.

HB 630. Health Communications: Theory and Practice.- This course is designed to investigate the role of communication theories and methods in promoting public health and preventing disease Both theoretical background in communication and behavioral science and practical communication/intervention development methods will be addressed. Course will be graded by letter.

HB 635. This course is designed for graduate students in public health and related fields interested in working with families and communities to improve health outcomes. It is intended to provide students with a broader understanding of the structural and psychosocial factors related to health and well-being. To do so, the course will focus on theoretical frameworks that draw on an ecological perspective and examine how factors associated with families, peers, schools, neighborhoods, and communities influence health. Emphasis will also be placed on the relevance of individual and community assets for the science of Health Behavior and the broader public health arena Course will be graded by letter.

HB 638Q.**Public Health Promotion and Aging Seminar.-**Exploration of current problems of the elderly, introduction to broad principles of health promotion for the elderly and review model health promotion programs. Course will be graded by letter. Course offered on-line.

HB 641. Research Methods in Behavioral Sciences.-Review of research methodology in behavioral sciences. Formulation of research questions, causality, experimental and quasi-experimental designs, reliability and validity, reporting findings. Prerequisite: Permission of instructor. Course will be graded by letter.

HB 643. Health Program Evaluation.-Principles and procedures to evaluate health promotion/disease prevention programs: data collection methods, instrument-scale development, measurement, evaluation designs, and analysis of case studies of disease prevention literature on evaluation. Course will be graded by letter. Pre-requisite HB 641.

HB 660. Adolescent Health: A Social and Behavioral Perspective.- Designed to provide students with the most current knowledge and analysis of issues influencing the health and well-being of adolescents.

Theoretical frameworks that draw on an ecological perspective will provide a better understanding of how families, peers, schools, and neighborhoods influence risk and protective factors in youth. Emphasis will be placed on the relevance of adolescent health issues for the science of Health Behavior and the broader public health arena. Course will be graded by letter.

HB 680. Health Promotion Through Radio Outreach.- Alternative methods for delivering health promotion messages to "hard-to-reach" audiences are being explored across the U.S. This course examines the strategy known as "entertainment education", specifically in terms of radio programming. Students who enroll will participate on the "BODYLOVE" script writers group as they learn to apply principals of behavior change in an "entertainment-education" format. "BODYLOVE" is a radio drama that is aired across the state of Alabama to educate people about risk factors for cardiovascular disease. Pass/No Pass

HB 692. Principles and Practices of Community Organization. - Seminar designed as an integrative experience for persons working with community groups. The focus is on learning to use available resources and advocating change to maximize community involvement. Course will be graded by letter. Prerequisite: Permission of Instructor.

HB 695. Seminar on Selected Health Behavior Topics.-Seminar covering a variety of health behavior topics. Prerequisite: Permission of instructor. Pass/No Pass.

HB 697. Internship.-Field experience under joint direction of appropriate faculty member and qualified health education specialist. Written report specifying activities, products, and outcomes of experience submitted upon completion of internship. Pass/No Pass. 3,6,9 hours.

HB 698. Master's Directed Research.-Independent study with guidance of appropriate faculty. Includes activities such as literature review and evaluation. Pass/No Pass. 1 - 9 hours.

HB 699. Master's Project Research.-Research for project under direction of research project committee. Pass/No Pass. 1 - 9 hours

HB 701. Theory-Based Measurement Development.-The aim of this course is to introduce students to measurement development based on well-specified behavioral theories. This course will review and discuss key issues related to measurement development such as item/scale development, number of factors to retain, rotation options and statistical programs. Prerequisite: Requires knowledge of elementary probability and statistics for non-statistics majors and BST 600.

HB 714. Survey Research Methods.-This course will provide students with a theoretical and practical overview of survey research methodology. Topics to be covered include questionnaire and interview design; tailoring instruments for specific settings, populations and methods of administration; maximizing reliability of measurement; construction of scales and indices; sampling theory and methods, assessing sampling bias, and maximizing response rates. Course will be graded by letter. Prerequisites: Doctoral standing or Permission of Instructor.

HB 720. Neighborhood Influences on Health Behavior.-To expose students to classical and current theories of neighborhoods and their affects on development and behavior in such a way that they will develop an appreciation for the importance of neighborhood context and its impact on development and behavior and the ability to critically evaluate studies of neighborhoods and neighborhood context, and the conceptual tools to be able to incorporate neighborhood (and other) contextual effects into their own research. Course graded by letter.

HB 730. Health Communication Research. In-depth exposure to current research involving media strategies used to persuade individuals to adopt new lifestyles. Critically examines major research conducted during last decade regarding single subjects, groups, communities, and media intervention. Focus on all media, including print, audiovisual, radio, and television.

HB 740. Evaluation Research: Health Promotion/Disease Prevention Research. Theory and applications of original behavioral repopulation, selection of measurement, data collection, design and analytical techniques, and preparation of evaluation research report. NIH-type research proposal required. Prerequisite: Doctoral student or advanced master's student with permission of instructor.

HB 750.Advanced Theoretical and Scientific Basis of Health Education and Promotion.-Provides doctoral students with in-depth examination of history and philosophy of health education; reviews professional competencies and outlines major theories of behavior change. Course will be graded by letter. Course graded by letter. 3 hours.

HB 760. Planning and Administration of Health Education and Promotion Programs.- The purpose of this course is to teach and practice the three basic phases of comprehensive health education and promotion programs (planning, implementation and evaluation). Course will be graded by letter. Course graded by letter. Prerequisites: HB 750 and HB 730.

HB 770. Doctoral Studies Seminar.- The broad intent of the course is to review current issues relevant to the field of Health Promotion/Health Education, critically examine the relationship between scholarship, research, ethics and funding, and reflect and discuss theoretical aspects of Health Promotion/Health Education. Course will be graded by letter. Prerequisites: HB 750, HB730 and HB 760.3 hours.

HB 780. Health Promotion and Aging Seminar.-Problems of aging and public health solutions for older Americans examined. Sub-areas of aging explores biological, social, behavioral, and economic aspects of aging. Community-based research/intervention project required. Course will be graded by letter.3 hours.

HB 798. Doctoral Directed Research.-Independent study with guidance of senior public health faculty. Pass/No Pass. 1-9 hours.

HB 799. Dissertation Research.-Research for dissertation under direction of dissertation committee. Pass/No Pass. Prerequisite: Students must be admitted to candidacy in order to register for this class.1 - 9 hours.

Education Psychology and Research (EPR)

510. **Introduction to Measurement and Evaluation in Education**. Basic concepts and principles of measurement and evaluation of personal and academic progress in classroom. Emphasis on elementary descriptive statistics and measurement techniques used in student evaluation. (Admission to TEP required; For Early Childhood/Elementary majors only) 3 Hours.

511. **Measurement and Evaluation in Education.** Basic concepts and principles of measurement and evaluation of personal and academic progress in classroom. Emphasis on elementary descriptive statistics and measurement techniques used in student evaluation. (Admission to TEP required; For Secondary Education Majors only) 3 Hours.

590. **Research and Program Evaluation in Counseling**. An overview of concepts, methods, and skills associated with applied research and program evaluation in counseling. Prerequisite: Only Open to Counseling Students. 4 Hours.

596. **Introduction to Qualitative Methods in Educational Research**. Fundamentals of qualitative research, its core characteristics, major designs, and practical application in education and social sciences. Introduction to designing and implementation of a qualitative research study. Qualitative research questions, Types of qualitative information, methods of data collection and analysis, presentation of results, and ethical issues. 3 Hours.

607. **Microcomputer Applications to Statistical Analysis**. Use of microcomputers in computations of descriptive statistics. Prerequisite or Corequisite: EPR 608. 1 hour.

608. **Statistical Methods and Action Research**. Statistical methods for describing sets of data, differences and relationships infused in an action research paradigm. Included are conceptualizing, implementing action research with computer applications. Corequisite: EPR 607. 3 Hours.

609. **Statistical Methods and Research in Education: Intermediate**. Basic inferential techniques including hypothesis testing and parametric and nonparametric techniques. A significant focus of this course is on assumptions, rationale, application and interpretation of various analysis of variance techniques. Prerequisites: EPR 607/608, intro graduate statistics class, or passing of a qualified exam. 3 Hours.

610. **Child Psychology**. Physical, cognitive, social, and moral development from infancy to the beginning of adolescence. 3 Hours.

611. **Adolescent Psychology**. Social, emotional, and cultural aspects of adolescence affecting classroom and school behavior. 3 Hours.

612. **Computer Assisted Qualitative Resear**ch. Provides opportunity to learn several popular qualitative computer packages including QSR N6, Atlas ti, MAXqda, and InVivo. 3 Hours.

614. **Lifespan Human Development**. Psychosocial, cognitive, moral, physical, and cultural aspects of development from conception through death and dying Prerequisite: General psychology. 3 Hours.

616. **Personality Theories for the Helping Professions**. Discussion of major theoretical perspectives of the development of personality: Prererquisite: general psychology. 3 Hours.

622. **Learning Theories**. Application of learning theories to educational practice. Behavioral theories, information processing, biochemical basis of memory and learning, as well as other major learning theories. Prerequisite: General Psychology. 3 Hours.

650. **Educational and Psychological Testing.** Prerequisite: EPR 607/608 or its equivalent. 3 Hours.

688. **Seminar on Current Issues in Measurement and Evaluation in Schools**. Issues of standardized testing and classroom assessment for teachers and administrators. 3 Hours.

691. **Independent Readings in Educational Psychology and Research**. Prerequisites: Permission of advisor and instructor. May be repeated for total of 6 hours. 3 hours.

692. **Introduction to Educational Research Design**. Reading, evaluating, and designing research in education and social sciences. Reviewing the literature. Quantitative, qualitative, and mixed methods approaches to research. Prerequisite or Corequisite: EPR 607/608. 3 Hours.

695. **Survey Methods in Educational Research**. Overview of the basic principles, applications, and types of survey research in education and social sciences. Survey implementation procedures, use of appropriate sampling techniques and principles of survey instrument construction Establishing reliability and validity of survey scales and instruments. Applied knowledge of designing a survey research study and developing a survey instrument. Prerequisite: EPR 607/608 and EPR 692 or their equivalents. 3 Hours.

696. **Qualitative Research: Inquiry and Analysis** – An in-depth insight into the history, philosophy and applications of qualitative research and its major designs. A structured field experience of designing and conducting a qualitative small-scale research study within a select qualitative approach. The use of qualitative software NVivo for data management and analysis is emphasized. Prerequisite EPR 596 and EPR 692 or their equivalents. 3 Hours.

698. **Individual Non-thesis Research in Educational Psychology**. Prerequisite: permission of instructor. 3 Hours.

700. **Data-Based Decision Making.** Prerequisite: EDL 711; Corequisite: EDC 731; EPR 700-L and EPR 700-R must be taken in conjunction with EPR 700

710. **Computer Applications and Advanced Statistical Methods** – Computer applications of multivariate statistical procedures including multiple regression, MANOVA, logistical regression, and factor analysis.. Prerequisites EPR 607, 608, 609 or equivalent. 3 Hours.

728. **Seminar on Research in Education**. Assisting school personnel in interpreting research findings. Prerequisite: Master's degree. 3 Hours.

792. **Mixed Methods Approaches in Educational Research** – Overview of mixed methods research and its applications in social and behavioral sciences. Applied knowledge of designing and conducting a mixed methods study. Development of the proposal for a mixed methods study with emphasis on the proposed study methodology. Prerequisites EPR 609, 596, 692. 3 Hours.

793. **Doctoral Seminar in Research Evaluation and Design.** Presentation and analysis of research in students' areas of interest. Prerequisite: Advanced graduate standing and graduate courses in statistics and research design. 3 Hours.

796. **Qualitative Research: Doctoral Seminar.** Focus on development of dissertation research proposal, qualitative methodology and means of analysis. 3 Hours.

Physical Education

Degrees offered include the Master of Arts in Education and the Educational Specialist. At the master's degree level, students may specialize in Exercise Physiology (see listing below for more information about this program) or complete a teacher certification program. (traditional master's program for those holding a valid B level certificate in physical education or the alternative master's program for those NOT completing an undergraduate physical education teacher education program). The teacher certification program links teacher certification with the graduate program in physical education. For example, the M.A. Ed. awards the level A certificate and the Ed.S. is linked to the AA certificate. Each program requires a teaching certificate in physical education at the previous level (e.g., B certificate for admission to the A level, except the Alternative A program, and the A certificate for admission to the AA certificate).

Dispositions

Physical Education faculty individually review the professional dispositions (behaviors and attitudes) of students within each course in accordance with the School of Education's policy and procedure. Additionally, faculty will collectively review student dispositions and overall progress in the program at the end of each semester. Dispositional areas identified as deficient could result in termination from the program**.**

Master of Arts in Education and "A" level teaching certificate; Non-Thesis (31- 37 hours)

Teaching Field: At least 1/3 of the program shall be teaching field courses. (18 hours)

PE 645	Motor Development	3
PE 647	Teaching Strategies and Issues in K-12 Physical Education	3
PE 643	Curriculum Development in Physical Education	3
PE 649	Adapted Physical Education	3
	600-level electives as approved by advisor advisor	6

Survey of Special Education Coursework: Required if not previously completed (0-3 hours)

ECY 600	Introduction to Special Education	0-3

Additional Courses: (13 -16 hours)

EPR 608	Statistical Methods and Research in Education	3
EPR 607	Microcomputer Applications to Statistics	3
Foundations and Professional Studies	(see approved list)	3

EDT 610, 620, or 630	Technology Competency	3
Elective	(as approved by advisor)	3

Master of Arts in Education and "A" level teaching certificate; Thesis (31-34 hours)
Teaching Field: At least 1/3 of the program shall be teaching field courses. (18 hours)

PE 645	Motor Development	3
PE 647	Teaching Strategies and Issues in K-12 Physical Education	3
PE 643	Curriculum Development in Physical Education	3
PE 649	Adapted Physical Education	3
PE 699	Thesis	6

Survey of Special Education Coursework: Required if not previously completed (0-3 hours)

ECY 600	Introduction to Special Education	0-3

Additional Courses: (13 hours)

EPR 608 609	Statistical Methods and Research in Education: Intermediate	3
EPR 607	Microcomputer Applications to Statistics	1
Foundations and Professional Studies	(see approved list)	3
EDT 610, 620, or 630	Technology Competency	3
EPR 692	Introduction to Educational Research	3

Alternative A (Non-Traditional 5th-Year Physical Education program) Non-Thesis (37-40 hours)

Additional requirements are 49 hours of prescribed coursework. Contact Student Services in Suite 100 Education Building, UAB for specific courses required.
Curriculum and Teaching:

PE 643	Curriculum Development in Physical Education	3

Professional Studies:

EDF or EPR 500 - 600 level course	Advisor Approval Required	3

Survey of Special Education Coursework: Required if not previously completed. (0-3 hours)

ECY 600	Introduction to Exceptional Learners	0-3

Technology:

EDT 610, 620, or 630	Technology Competency	3

Evaluation of Teaching and Learning:

EPR 608	Statistical Methods and Research	3
EPR 607	Microcomputer Applications in Statistical Analysis	1

Reading :

EDR 551	Reading in the Content Area	0-3

Internship:

PE 696	Elementary/Secondary Physical Education Internship	9

Teaching Field:

At least 1/3 of the program shall be teaching field courses (12)

PE 645	Motor Development	3
PE 647	Teaching Strategies and Issues	3
PE 649	Adapted Physical Education	3
PE 607	Coaching Young Athletes	3
PE 509	Assessment in Physical Education	3
PE 589	Instructional Strategies in K-12 Physical Education	3

Ed.S. Degree (31-37 hours)

Teaching Field:

At least 1/3 of the program shall be teaching field courses (21 hours)

PE 726	Supervised Research in Physical Education	3
PE 728	Seminar in Physical Education	3
	600 and 700 level Physical Education courses	15

(PE 643, 645, 647 and 649 must be taken if comparable courses were not part of the master's program

Survey of Special Education Coursework: Required if not previously completed. (0-3 hours)

ECY 600	Introduction to Special Education	0-3

Additional Courses:

EPR 692	Introduction to Educational Research	3
EPR 609	Statistical Methods and Research: Intermediate	3
	Technology Competency	0-3
Electives with Permission of advisor	600- or 700-level Professional Studies or Teaching Field courses	3

Exercise Physiology

The Exercise Physiology specialization offers a master's degree option for students interested in either clinical exercise physiology or physiology research. The curriculum is multidisciplinary and comprises courses in the Schools of Education, Medicine, Health Related Professions, and Public Health. Two program plans are offered (detailed below). Plan I culminates with a thesis research project, and Plan II culminates with a written comprehensive exam. Resources for student participation in research include a Muscle Research Laboratory, a Strength Performance Laboratory, and a Body Composition/Energy Metabolism Laboratory. Wide arrays of field experiences are also available in local agencies and clinics. In addition to Graduate School admission requirements, prospective students must have completed undergraduate coursework in physiology, anatomy, and chemistry. First-year students begin in the fall term. Listed below are the courses required in the program and a sample of elective courses.

M.A.Ed. Program

Admission Requirement and Prerequisites

In addition to the general admission requirements of the Graduate School, the following prerequisites apply to these programs. The prerequisites are not part of the graduate program. Applicants without the prerequisites may be admitted conditionally and take up to 12 semester hours of graduate work while completing the prerequisites. Specific course prerequisites are determined on an individual program basis by the student's advisors.

Plan I (27 hours and thesis)

Major Courses (12-15 hours)

Course	Course Name	Semester Hours
PE 637	Exercise Physiology I	3
PE 638	Exercise Physiology II	3
EPR 692	Research Methods	3
PE 642	Practicum in Exercise Physiology	3
EPR 609	Statistical Methods and Research in Education	3
	Thesis	6

	Related Field	6-9

Plan II (36 hours of coursework)
Major Courses (12-15 hours)

Course	Course Name	Semester Hours
PE 637	Exercise Physiology I	3
PE 638	Exercise Physiology II	3
EPR 692	Research Methods	3
EPR 609	Statistical Methods and Research in Education	3
	Elective in Major	3
	Thesis Substitution	12
	Related Field	6-9

Sample Major Electives for Plan I and II

PE 656	Advanced Sport Psychology
PE 640	Advanced Techniques in Conditioning the Athlete
PE 639	Exercise Prescription for High Risk Populations
PE 672	Advanced Treatment of Athletic Injuries
PE 674	Sport Performance and Nutrition
PE 645	Motor Development
PE 695	Problems in Physical Education
PE 630	Mechanical Analysis of Motor Skills
PE 585	Principles of Fitness Leadership

Sample Courses for Related Fields, Plan I and II

NTR 601	Medical Nutrition
NTR 618	Nutritional Biochemistry I
NTR 619	Nutritional Biochemistry II
NTR 650	Body composition & energy Metabolism
PHA 602	Epidemiology of Chronic Disease

GER 540	Biology of Aging
HE 502	Mental Health & Stress Management
HE 532	Administration of Health & Fitness Programs

Course Descriptions

Physical Education (PE)

601. **Introduction to Sport Administration**. Planning, organizing, staffing, managing, directing, and evaluating sport and athletic programs.

607. **Principles of Coaching**. Philosophy, physiology, pedagogy, athletic training, and law related to coaching.

615. **Sport Facility Planning**. Factors influencing the planning, funding, and construction of a variety of sports facilities.

630. **Mechanical Analysis of Motor Skills**. Application of principles of physics to human movement. Analysis through videotape and cinematography techniques. Prerequisite: PE 307 or equivalent.

631. **Foundations of Physical Education**. Overview of various subfields of physical education.

632. **Supervision of Physical Education**. Study of skills required to supervise teachers of physical education and in other related fields.

636. **Current Readings in Physical Education**. Individual readings on contemporary topics and issues in physical education. Prerequisite: Permission of advisor.

637. **Physiology of Exercise I .** Description of basic organ systems and their functioning in relationship to the physiology of exercise.

638. **Physiology of Exercise II**. Applied exercise physiology information, techniques, and research methods.

639. **Exercise Prescription for High Risk Populations**. Lecture and laboratory practice; physiological basis of exercise testing and training. (Prepares students to take ACSM Exercise Specialist certification examination.) Prerequisites: PE 400 and BY 115.

640. **Advanced Techniques in Conditioning the Athlete**. Advanced training principles; developing testing and training programs for athletes. Prerequisites: PE 400, BY 115 and 116.

642. **Practicum in Physiology**. Practical experience and observations in human physiology. Seminars by medical, dental, and nursing faculty. Effects of drugs, diet, exercise, and disease on human body. Prerequisite: PE 641. 3 or 6 hours.

643. **Curriculum Development in Physical Education**. Trends in methodology, programming, and scheduling.

645. **Advanced Motor Development**. Factors influencing development of motor skills across lifespan.

647. **Teaching Strategies and Issues in K-12 Physical Education**. Design, implementation, and evaluation of appropriate physical education programs for elementary and secondary schools.

649. **Adapted Physical Education**. Current research and teaching methodology in adapted physical education; nature of selected disabilities, implications for physical education.

650. **Social Aspects of Sport**. The purpose of this course is to study sport from a sociological perspective. The course will explore the importance of sports in people's lives and the sports connection with culture and society.

651. **Issues and Problems in Coaching**. This course is designed to allow the students to approach issues and problems from a practical perspective, particularly related to legal duties.

652. **Measurement and Evaluation of Athletes**. This course is designed to help athletic coaches locate, select, and construct quality sport skill tests. Students will review reasons why coaches should measure and evaluate athletes, and survey sound testing procedures.

653. **Planning Activity Programs for Individuals with Disabilities.** This course is designed to provide students with knowledge and skills needed to meet the unique fitness and physical activity needs of individuals with various disabilities.

655. **Motor Learning**. Factors influencing learning and performance of motor skills.

656. **Advanced Sport Psychology**. Relationship of psychology to sports performance.

663. Challenge Course Fundamentals I. Improvement of self-concept and social skills through physical, spiritual, emotional, and mental development in creative activity outdoors. Natural environment used as a learning laboratory for leadership, teamwork, problem solving, decision-making, and conflict resolution and physical fitness.

664. Challenge Course Fundamentals II. This course continues introducing to the background, philosophy, ethical issues, risk management required for high ropes facilitation. Introduces students to a variety of high challenge course initiatives used for learning and problem solving, trust team building, and self-confidence and communication skills. How to present high challenge course initiatives to diverse groups will be emphasized. Specific attention will be given to addressing learners of different ages and varying abilities. Additionally, an overview will be given of how counseling and ropes courses experiences can be integrated.

665. Adventure Processing and Facilitation. This course provides the skills necessary for facilitating a variety of groups-educational, recreational, corporate-indoor experience programs. The curriculum includes the Experiential Learning Cycle, stages of group development, leading group discussion, active listening, frontloading, debriefing, use of metaphors, and transfer of learning. Activities are used to facilitate leadership, teamwork, problem-solving, decision-making, and conflict resolution. This knowledge will enhance students' ability to adapt their programs to various groups. How to facilitate and lead group discussions with diverse groups will be emphasized.

666. Organization and Administration of Adventure Education. Students will synthesize their experience in adventure leadership, instruction and programming to explore the details of managing an adventure program. Topics include risk management, legal issues, accreditation standards, staff recruitment, hiring and training, marketing, and fiscal management. Special attention will be given to managing a universally designed challenge course

672. **Advanced Treatment of Athletic Injuries**. Seminar and practical experience. conducted by certified trainers in the UAB Athletics Department.

674. **Sport Performance and Nutrition**. Nutrition, rest, and training research relating to coach-player-doctor-trainer relationship, legal implications relating to competitive athletics.

690. **Seminar in Sports Administration**. Seminar related to practical experiences associated with administrative duties and details of a sport program.

694**. Special Projects in Physical Education**. Independent projects supervised by faculty. Prerequisite: Permission of advisor. 1, 2, 3, or 6 hours.

695. **Problems in Physical Education**. Contemporary topics in physical education (class meeting format). Prerequisite: Permission of advisor. 3 or 6 hours.

696. **Elementary/Secondary Physical Education Internship**. Clinical placement in approved school. Required in nontraditional 5th-Year Program. Prerequisite: Completion of appropriate coursework. 9 hours.

697. **Advanced Field Experience in Physical Education**. Clinical placement in approved sites. Prerequisite: PE 647 or 48 9 . 3 or 6 hours.

698. **Coaching Internship (Individual Sport)**. 100 clock hours of experience with veteran coaches. Prerequisite: PE 407 or 607.

*699. **Thesis Research**. Supervised research project. Prerequisite: Admission to candidacy and permission of advisor. 1, 2, 3, or 6 hours.

710**. Special Topics in Physical Education**. Special courses offerings on contemporary topics. Prerequisite: Permission of instructor.

715. **Advanced Field Experience in Physical Education**. Supervised field experiences in public school clinical sites. Prerequisite: PE 488 or 647. 3 or 6 hours.

718. **Practicum in Exercise Physiology**. Practical experience and observations in human exercise physiology. Prerequisite: PE 641 and permission of advisor.

720. **Research Design and Methodology**. Measurements and research design in areas of biomechanics, motor learning, motor development, sport psychology, and exercise physiology. Prerequisite: EPR 692 or equivalent.

726. **Supervised Research in Physical Education**. Independent student research supervised by a full-time program faculty member. Prerequisite: Permission of advisor, and EPR 609 and 692. 3 or 6 hours.

728. **Ed.S. Thesis Research**. Prerequisite: Admission to candidacy, research methods and sufficient course work in area of emphasis to be able to formulate a problem, develop a research design, and write a thesis proposal. Permission of advisor and instructor. Pass/Fail. 3 or 6 hours.

729. **Seminar in Physical Education**. Development of thesis presentation. Prerequisite: Permission of advisor. 3 hours

Biomedical Engineering (Ph.D., M.S.B.M.E., M.S.B.M.E. with Certificate in Life Sciences Entrepreneurship)

Degrees Offered: Ph.D., M.S.B.M.E., M.S.B.M.E. with Certificate in Life

	Sciences Entrepreneurship
Phone:	(205) 975-2119
E-mail:	uabbmegrad@uab.edu
Web site:	www.uab.edu/bme

Faculty

Joel L Berry, Research Associate Professor (Biomedical Engineering); Medical Device Design, Cardiovascular Biomechanics, Cardiovascular and Orthopedic Tissue Engineering, Medical Device Entrepreneurship

Allan C. Dobbins, Associate Professor (Electrical Engineering); Human and Machine Vision, Neural Computation, Brain Imaging, Scientific Visualization

Alan Eberhardt, Professor (Theoretical and Applied Mechanics); Solid Mechanics, Injury Biomechanics, Biomedical Implants, Analytical and Numerical Methods in Biomechanics

Vladimir G. Fast, Associate Professor (Physics); Cardiac Electrophysiology, Optical Mapping of Arrhythmias and Defibrillation

Dale S. Feldman, Associate Professor (Bioengineering); Biomaterials, Soft-Tissue Biomechanics, Polymeric Implants

Ho-Wook Jun, Associate Professor (Bioengineering); Biomimetic Nanotechnology, Biomaterials, Tissue Engineering

Andrew E. Pollard, Professor (Biomedical Engineering); Cardiac Electrophysiology, Computer Simulations and Modeling of Electrical Signals of the Heart

Jack M. Rogers, Professor (Bioengineering); Cardiac Electrophysiology, Computer Simulations, Signal Analysis of Cardiac Arrhythmias

Yuhua Song, Associate Professor (Materials Science and Engineering); Computational Biomechanics, Computational Biology, Multiscale Modeling

Rina Tannenbaum, Professor (Chemical Engineering); Soft Condensed Matter, Nanoscale Self-Assembly, Chemistry at Interfaces

Timothy M. Wick, Professor and Chair (Chemical Engineering); Orthopedic and Cardiovascular Tissue Engineering, Regenerative Medicine, Bioreactor and Bioprocess Design, Cryopreservation, Cell Adhesion

Xincheng Yao, Associate Professor (Optics); Optical Imaging of Neural Function, Optical Coherence Tomography

Adjunct Faculty

Andreas Anayiotos, Associate Professor (Engineering); Professor, Department of Mechanical Engineering and Materials Science and Engineering, Cyprus University of Technology; Cardiovascular Fluid Mechanics, Cardiovascular Modeling, Computational Hemodynamics

Martha W. Bidez, Professor (Biomedical Engineering); President and CEO, BioEchos; Injury Biomechanics, Automotive Safety

Ginger Campbell, Professor (Emergency Medicine); Mind-body medicine, the brain and consciousness

Glenn S. Fleisig, Assistant Professor (Biomedical Engineering); Research Director, American Sports Medicine Institute; Sports and Injury Biomechanics

Richard A. Gray, Associate Professor (Biomedical Engineering); Office of Science and Engineering Laboratories, Center for Devices and Radiological Health, U.S. Food and Drug Administration; Optical Mapping of Fibrillation and Defibrillation

Rodolphe Katra, Assistant Professor (Biomedical Engineering); Principal Scientist, Research and Technology, Corventis Medical; Remote Disease Monitoring and Prediction, Cardiac Electrophysiology

Donald B. Twieg, Professor (Biomedical Engineering); Medical Imaging, Magnetic Resonance Imaging (MRI) Techniques, Functional MRI of Brain and Heart

Emeritus Faculty

Ernest Stokely, Professor Emeritus (Biomedical Engineering); Associate Dean Emeritus; Magnetic Resonance Imaging, Signal Processing, Image Processing

William Smith, Professor Emeritus (Physics); Biomedical Instrumentation, Cardiac arrhythmias, Fibrillation and Defibrillation.

Secondary Faculty

Xun Ai, Assistant Professor, Division of Cardiovascular Disease (Department of Medicine); Molecular and electrophysiological mechanisms of cardiac arrhythmias; molecular and electrophysiological remodeling in failing and diabetic heats

Jonas S. Almeida, Professor and Director, Division of Informatics (Department of Pathology); Computational Infrastructure for Integrative Bioinformatics

Franklin Amthor, Professor (Psychology); Neurophysiology of vision computer graphics

Susan L. Bellis, Professor (Cell, Developmental & Integrative Biology); Integrin Biology/implant surfaces

James Broome, Professor (Prosthodontics); Polymers, adhesives, physical and mechanical testing, clinical research

Brigitta Brott, Associate Professor, Division of Cardiovascular Disease (Department of Medicine); Angiogenesis, cardiac angioplasty, coronary artery disease, cardiac catheterization, interventional cardiology and stents

John O. Burgess, Professor (Prosthodontics); Clinical trials, caries models, dental materials

Derrick Dean, Associate Professor (Materials Science and Engineering); Polymers

Lawrence J. DeLucas, Professor (Optometry); Protein crystal growth

Georg Deutsch, Associate Professor (Radiology); Cognitive neuroscience and brain imaging

Hassan Fathallah-Shaykh, Associate Professor (Neurology); Systems biology of cancer, the dynamics of molecular networks, biological rhythms, and modeling/analysis of microarray data

John Fiveash, Associate Professor (Radiation Oncology); Clinical trials of novel therapeutics in combination with radiation therapy, particularly in the treatment of brain and prostrate tumors; treatment planning research and education IMRT and IGRT

Paul D. R. Gamlin, Professor (Vision Sciences); Eye movements, Pupillary Light Reflex

Timothy J. Gawne, Associate Professor (Vision Sciences); Central Visual Processing

Ken Hoyt, Assistant Professor (Radiology); Contrast-enhanced ultrasound imaging with a focus on the associated bioeffects, contrast agent targeting, and the potential for localized drug delivery

Raymond E. Ideker, Professor, Division of Cardiovascular Disease (Department of Medicine); Study of Cardiac Arrhythmia, Cardioversion and Electrical Ablation for Treatment of Arrhythmia

Tom Jannett, Professor (Electrical and Computer Engineering); Control systems, Biomedical Instrumentation, Modeling and Simulation, Intelligent Sensor Networks

Amjad Javed, Associate Professor (Oral and Maxillofacial Surgery); Bone, cartilage development and remodeling, Adipogenesis, gene knock-out models, transcriptional regulation of skeletal cell differentiation

Kent T. Keyser, Professor (Vision Sciences); Neurotransmitters and receptors

Hyunki Kim, Assistant Professor (Radiology); Breast, pancreatic, and brain cancer imaging

Dennis F. Kucik, Associate Professor (Pathology); Cell adhesion and motility

Adrienne C. Lahti, Professor (Psychiatry); Use of multimodal brain imaging techniques (PET, fMRI, MR Spectroscopy) to study the neuropathology of schizophrenia and bipolar disorder and to evaluate the effects of psychotropic drugs on brain function and biochemistry; Translational work aiming at bridging human brain imaging and postmortem studies

Chris M. Lawson, Professor (Physics); Nonlinear Optics, Fiber Optics, Optical Sensors

Jack Lemons, Professor (Biomaterials); Biocompatibility profiles of surgical implant devices with an emphasis on the role(s) of element and/or force transfers along biomaterial-to-tissue interfaces

Lei Liu, Associate Professor (Optometry); Low vision visual function and rehabilitation

Mary MacDougall, Professor (Oral and Maxillofacial Surgery); Genetic dental diseases, tooth development, mineralized matrix, gene regulation

Michael McCraken, Associate Professor (Prosthodontics); Dental implants, Biomimetic materials, growth factors

Erwin Montgomery, Professor (Neurology); Deep brain stimulation

Joanne E. Murphy-Ullrich, Professor (Pathology); Regulation of cell death and motility by cell adhesion signaling and role of growth factor control in diabetic and fibrotic diseases

L. Burt Nabors, Professor (Neurology); Brain tumor treatment and research program

Alfred Paige, Assistant Professor (Neurology); Treatment of epilepsy, seizure localization and epilepsy surgery

Vladimir Parpura, Associate Professor (Neurobiology); Ion channels and synaptic function systems Neuroscience and vision

Steven Pogwizd, Professor, Division of Cardiovascular Disease (Department of Medicine), Medicine, Physiology and Biophysics

Brent Ponce, Assistant Professor (Surgery)

Charles W. Prince, Professor (Nutrition Sciences); Dental nutrition, Bone Biochemistry, Vitamin D, Calcium and Phosphorus Metabolism

Firoz Rahemtulla, Professor (Oral Biology); Connective Tissue Biochemistry

Michelle Robbin, Professor (Radiology); Hemodialysis patient ultrasound, ultrasound contrast agents and vascular ultrasound

Rosalia Scripa, Professor (Materials Science and Engineering); Ceramics and glass, Extractive Metallurgy, Semiconductor Crystal Growth, Electronic-Magnetic Materials

Jere Segrest, Professor, Division of Gerontology/Geriatrics/Palliative Care (Department of Medicine); Plasma Lipoprotein Structure and Function

Rosa Serra, Professor (Cell, Developmental & Integrative Biology); Mechanism of TGF-ß action in developmental and disease processes

Murat Tanik, Professor (Electrical and Computer Engineering); Software Systems Engineering, Integrated Systems Design, Process Engineering

Gregg Vaughn, Professor (Electrical and Computer Engineering); Digital signal processing, applications of microprocessors, digital communications

Kristina M. Visscher, Assistant Professor (Neurobiology); Human behavior and brain activity using precise behavioral measurements (including psychophysics and tracking of eye movements), functional magnetic resonance imaging (fMRI) and electroencephalography (EEG)

Yogesh Vohra, Professor (Physics); Biotechnology, Nanostructured Materials

Harrison Walker, Assistant Professor (Neurology); Deep brain stimulation for the management of Parkinson's disease and other movement disorders

Yuhua Zhang, Assistant Professor (Ophthalmology); Advanced retinal imaging technology

LuFang Zhou, Assistant Professor, Division of Cardiovascular Disease (Department of Medicine); Pathophysiology and therapeutics of oxidative stress related to diseases of mitochondrial origin as it pertains to cardiovascular disease and diabetes

Yong Zhou, Assistant Professor, Division of Pulmonary/Allergy/Critical Care (Department of Medicine); Myofibroblast differentiation and emphysema

Program Information

M.S.B.M.E. Program

The Master of Science in Biomedical Engineering prepares students for entry into the doctoral program, biomedical industry, or professional school. Primary research areas are biomedical imaging, biomedical implants and devices, cardiac electrophysiology, multiscale computational modeling, tissue engineering and regenerative medicine. Other research opportunities are available through our ongoing collaborations with the UAB Medical and Dental Schools. With the terminal degree, employment is usually found in health-care delivery, medical devices, pharmaceuticals, biomedical imaging, instrumentation, medical sales and marketing, regulatory agencies, or computer application groups. For admission to the program, a student should have earned a bachelor's degree in biomedical engineering, engineering or a closely related field.

Students with undergraduate degrees in the physical sciences, life sciences, or mathematics will also be considered for admission; however, such students may be required to demonstrate competence in engineering areas usually found in an undergraduate engineering curriculum. In some cases, preparatory courses in mathematics, engineering or life sciences may be required, with specific recommendations made by the Biomedical Engineering (BME) Graduate Program Committee. Admission to the BME Master’s program is competitive, and successful applicants will usually present scores of at least 156 on the verbal and at least 159 on the quantitative sections of the GRE General Test (equivalent to 550 and 750 under the previous scoring system).. Typical students have an undergraduate GPA of 3.5 or greater and have participated in at least one research project while an undergraduate (e.g., honors research, summer research experience, laboratory research, senior design, internship).

The student's research advisor and the Graduate Program Committee work to devise an individualized curriculum developed to ensure each student obtains the coursework to provide an in-depth knowledge of both quantitative methods and human physiology necessary to succeed in completion of the thesis research. The master's degree requires a minimum of 24 semester hours of graduate coursework beyond the bachelor's. This includes: BME 517 Engineering Analysis, BME 670 Quantitative Physiology, three one-hour departmental seminar courses (BME 601), at least one 3-hour Biostatistics course. Additional coursework is a combination of graduate level life sciences and bioengineering courses selected in consultation with your thesis advisor and approved by the BME Graduate Program Committee.

The majority of students carry out research leading to a thesis (plan I option). To receive a master's degree in BME, the student must publish their research in a peer-review journal article; typically a first-author publication. The student is expected to present their research at a scientific or technical conference; preferably at a relevant national or international scientific meeting. Publication of at least one peer-reviewed manuscript is a requirement for graduation from the BME M.S.B.M.E. Program. Plan I students must register for at least six semester hours of BME 699 (thesis research) and successfully write, present and defend a thesis based on their research.

Additionally, BME now offers a Master's in Biomedical Engineering with a Certificate in Life Sciences Entrepreneurship. This represents a unique graduate training program featuring collaboration between BME and the UAB School of Business. Biomedical engineering principles are blended with business-model planning in an effort to equip students to not only become scientists and researchers, but also capable business professionals. BME students partner with Business students pursuing an MBA to turn biomedical devices into commercial successes that are marketed worldwide. They will participate in the Invention to Innovation (i2i) activities, in which they will pitch their start-up companies and enter business plan competition with the Alabama Launchpad (http://www.alabamalaunchpad.com/). In addition to the BME course and thesis requirements, students in the MSBME with a Certificate in Life Sciences Entrepreneurship will take 12 credit hours of MBA coursework, including MBA 681: Idea to IPO; MBA 673: Technology-based Venture Planning; MBA 690: Managing Innovation; and MBA 691: The i2i Entrepreneur Accelerator Directed Independent Study.

Ph.D. Program

The Ph.D. degree prepares students for careers in industry and academics. Students entering the doctoral program will possess an M.S. or be currently enrolled in the D.M.D/Ph.D. or M.D./Ph.D. program at UAB. Students earning an M.S. in BME and desiring to stay for the Ph.D. can petition the BME Graduate Program Committee upon successful defense of their M.S.B.M.E. Only Plan I M.S. students are considered for the Ph.D. program; these students do not have to reapply to the Graduate School, but

instead petition the BME Graduate Program Committee. The decision is based on the student's academic record as well as recommendations from the student's M.S. thesis committee. Students who have earned a M.S. degree elsewhere may apply directly to the BME Ph.D. program.

Admission to the Ph.D. program is competitive, and successful applicants will usually present scores of at least 156 on the verbal and at least 159 on the quantitative sections of the GRE General Test (equivalent to 550 and 750 under the previous scoring system).. Typical students have a graduate GPA of 3.5 or greater and have their previous research in a peer-review journal. Students admitted to the Doctoral program typically receive a competitive stipend that usually includes payment of tuition.

The Ph.D. degree requires a minimum of 18 semester hours of graduate coursework beyond the master's. This includes: BME 517 Engineering Analysis, BME 770 Quantitative Physiology, and at least one 3-hour Biostatistics course (BST 621) if not taken as part of the students master's program. One additional statistics course is strongly recommended for the Ph.D. degree (BST 621 and 622). Additionally, Ph.D. students must complete three semester hours of Departmental Seminar (BME 701). At least 12 hours of Dissertation Research (BME 799) is required for the Ph.D. degree. Additional graduate level life sciences and/or bioengineering coursework may be required in conjunction with the student's dissertation research committee. The program of study for each student is defined by the student and the Research Advisor and approved by the Graduate Program Committee during the student's first year of doctoral study. Near the completion of the course plan, a written proposal for the dissertation research must be submitted and presented to the Dissertation Committee before the student can be admitted to candidacy for the degree. A dissertation that presents the results of the student's original research must be successfully defended.

Ph.D. students are required to publish two additional manuscripts, typically first-author peer-review publications. Ph.D. students are required to present their research in a BME seminar near the end of their studies. Ph.D. students are expected to present their research at a relevant national or international scientific or technical conference meeting.

NIBIB Supported T-32 Predoctoral Training Grant

National Institute of Biomedical Imaging and Bioengineering (NIBIB) has awarded an interdisciplinary predoctoral training grant to UAB that is entitled "Nanotechnology in Biosensors and Bioengineering". It is a five-year program that started on September 1, 2007. Benefits to participating graduate students include: graduate stipends of $25,000 per year, full tuition and health insurance, and a travel award of $1,000 per year. The purpose of this grant is to implement a training program at the interfaces of physics, chemistry, materials science and engineering, and biomedical engineering that will reduce the time from

discovery of a new tool in nanotechnology to its application in medical devices, tissue engineering, and biosensors for earliest detection of molecular signatures of disease.

For more information regarding this training program, visit
http://www.uab.edu/cnmb/graduate-training

Additional Information

Deadline for Entry Term(s):	Fall
Deadline for All Application Materials to be in the Graduate School Office:	February 1
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL is also required for international applicants whose native language is not English)
Comments	Students are rarely admitted for the Spring term

For detailed information, contact Dr. Vladimir Fast, Associate Professor, BME Graduate Program Director, UAB Department of Biomedical Engineering, 1670 University Blvd., Volker Hall B126, Birmingham AL 35294-0019.

Telephone (205) 975-2119

E-mail uabbmegrad@uab.edu

Web www.uab.edu/bme

Course Descriptions

Unless otherwise noted, all courses are for three semester hours of credit. Course numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

Biomedical Engineering (BME)

598 **Biomedical Product Development**. Design and development issues of the medical products industry. Consideration of the impact of legal, regulatory and marketing issues, business ethics and economics will be addressed. 3 credit hours.

508 **Biofluids**. Application of fluid mechanics in blood flow in the circulatory system; cardiovascular fluid mechanics, wall shear stress and the development of atherosclerosis, viscoelastic behavior of the arteries, Non-Newtonian character of blood. 3 credit hours.

512 **Biomechanical Measurements.** Observation, measurement and analysis of basic biomechanical variables such as stress, strain, pressure and flow. Emphasis on basic experimental examples and using the computer for data acquisitions, processing, analysis and preparation of laboratory reports. 3 credit hours.

517 **Engineering Analysis.** Solutions to engineering problems involving ordinary and partial differential equations; Laplace transforms, power series, Bessel functions, Legendre polynomials, Fourier series, Fourier integral and transform, Sturm-Liouville and separation of variables. 3 credit hours.

520 **Implant-Tissue Interactions**. An overview of implant biocompatibility including tissue histopathology, histology of implant response and the regulatory process for medical devices. 3 credit hours.

523 **Living Systems Analysis.** Basic concepts and techniques of measurement processing and analysis of data from living systems, statistics, analysis of variance, regression analysis. Labs include blood flow data acquisition and analysis, implant biocorrosion testing, evaluation and analysis of cell proliferation and apoptosis. 3 credit hours.

535. **Tissue Engineering.** Principles underlying strategies for regenerative medicine such as stem-cell based therapy, scaffold design, proteins or genes delivery, roles of extracellular matrix, cell-materials interactions, angiogenesis, tissue transplantation, mechanical stimulus and nanotechnology. Prereq: BME 210. 3 hours

542 **Principles of Medical Imaging.** Medical imaging modalities such as x-ray, CT, Nuclear imaging. Principles and physics of interaction of ionizing radiation with matter, bremsstrahlung, attenuation coefficients, compton scatter, nuclear disintegration of radionuclides and generation of medical radionuclides. 3 credit hours.

543 **Medical Image Processing.** A lab-based introduction to processing, analysis and display techniques for medical imaging. 3 credit hours.

546 **Principles of MRI.** Technical fundamentals of NMR imaging and applications. Governing physics, MR imaging techniques and clinical role of MR imaging. 3 credit hours.

550 **Computational Neuroscience.** Computational principles used by the nervous system. Topics include biophysics of axon and synapse, sensory coding with emphasis on vision and audition, planning

and decision-making and synthesis of motor responses. Emphasis on a systems approach throughout. Simulations. 3 credit hours.

561 **Bioelectric Phenomena.** Quantitative methods in the electrophysiology of neural, cardiac and skeletal muscle systems. 3 credit hours.

562 **Cardiac Electrophysiology.** Semi-quantitative methods in cardiac electrophysiology. Analysis of the electrocardiogram, cellular dynamics, propagation in the heart including spiral waves, and the effect of electric fields on the heart. 3 credit hours.

571 **Continuum Mechanics of Solids.** Matrix and tensor mathematics, fundamentals of stress, momentum principles, Cauchy and Piola-Kirchoff stress tensors, static equilibrium, invariance, measures of strain, Lagrangian and Eulerian formulations, Green and Almansi strain, deformation gradient tensor, infinitesimal strain, constitutive equations, finite strain elasticity, strain energy methods, 2-D Elasticity, Airy Method, viscoelasticity, mechanical behavior of polymers. 3 credit hours.

580 **Biomolecular Modeling:** Principles and applications for biomolecular modeling: protein structure, molecular dynamics, force field, docking, electrostatics, biomolecular diffusion. Throughout the course, the students are offered hands-on exercises in molecular modeling tools and software. Co-req: BME 517 or the permission of Instructor. 3 credit hours.

601, 701. **Seminars in Biomedical Engineering**. Current topics in biomedical engineering technology and applications. Pass/Fail. 1 hour each.

616, 716. **Instrumental Methods of Analyses**. Techniques used to evaluate biomaterials: FTIR, AES/XPS, AFM/STM, electrochemical corrosion evaluations, and mechanical testing. 3 credit hours.

619 **Advanced Biofluids**. Bioelectric signals, transduction devices and processes; analog and digital signal processing; system response characteristics. 3 credit hours.

623, 723. **Biocompatibility. Wound Healing**. Study of principles of healing and methods to enhance, and clinical applications. 3 credit hours.

633, 733. **Biomechanics:** Tissue Mechanics I Fundamentals of hard and soft tissue mechanics. Biomechanical problems, with emphasis on bone, ligament, tendon and cartilage. 3 credit hours.

637, 737. **Biomechanics: Tissue Mechanics II** . Advanced topics in tissue mechanics, including structure-function analysis and modeling of trabecular bone, biphasic theory for articular cartilage. 3 credit hours.

646/746 **Biomedical Optics: Principle & Imaging.** Fundamentals of light-matter interactions and principles of biomedical optics imaging techniques, such as light spectroscopy, light microscopy, confocal microscopy, multi-photon microscopy, optical coherence tomography, photoacoustic tomography, etc. 3 credit hours.

647, 747. **Medical Imaging: Advanced MRI and fMRI**. Advanced MRI techniques, functional MRI methods including spectroscopy, perfusion and diffusion imaging. 3 credit hours.

664, 764. **Neural Computation**. The principal theoretical underpinnings of computation in neural networks, understanding the relationship between the different approaches: dynamical systems, statistical mechanics, logic, Kalman filters, and likelihood/Bayesian estimation. 3 credit hours.

665, 765. **Computational Vision**. Study of biological and artificial vision from a theoretical perspective. Begins with a comparative survey of visual systems and examines vision algorithms and architectures. 3 credit hours.

670, 770. **Quantitative Physiology**. Study of physiological problems using advanced mathematical techniques. Topics covered include: mechanics, fluid dynamics, transport, electrophysiology of cell membranes, and control systems. Prereq: BME 517 *OR* ME 567. 3 credit hours.

676, 776 **Fracture Mechanics**. Linear elastic mechanics, Griffin energy balance, Airy & Westergaard solutions, elastic-plastic fracture mechanics, materials testing and applications. 3 credit hours.

691, 791 **Special Topics in (Area).** Course syllabus and grading policy required. 1-6 hours.

693, 793 **Internship in BME.** Course syllabus and grading policy required. 1-6 hours.

697 **Journal Club in (Area).** 1 hour each.

698. **Non-thesis Research**. Pass/Fail, 1-12 hours.

699. **Thesis Research**. Prerequisite: Admission to candidacy. Pass/Fail. 1-12 hours.

706. **Introduction to Biomedical Instrumentation**. Instrumentation used in measurement of physiological parameters. Prerequisites: EE 351. 3 credit hours.

707 **Biomedical Instrumentation and Signal Processing I, II**. Bioelectric signals, transduction devices and processes, analog and digital signal processing, system response characteristics. Prerequisite: BME 630. 3 hours each.

798. **Non-dissertation Research**. Pass/Fail. 1-12 hours.

799. **Dissertation Research**. Prerequisite: Admission to candidacy. Pass/Fail. 1-12 hours.

Civil Engineering (M.S.C.E., Ph.D.*)

*The Ph.D. is offered through a joint program with the University of Alabama in Huntsville.

Degree Offered: M.S.C.E., Ph.D.

Director: Dr. Robert W. Peters

Phone: (205) 934-8430

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Web site: **www.eng.uab.edu/cee**

Primary Faculty

Fouad H. Fouad, Chair and Professor (Civil, Construction, and Environmental Engineering); Structural Engineering Concrete Structures, Precast Concrete Products, Concrete Materials; Sustainable Engineering Design

Wilbur A. Hitchcock, Professor (Civil, Construction, and Environmental Engineering); Construction Engineering Management, Structural Engineering

Jason T. Kirby, Associate Professor (Civil, Construction, and Environmental Engineering); Environmental Engineering, Hydraulics, Hydrology, Sustainable Engineering Design

Melinda M. Lalor, Associate Professor (Civil, Construction, and Environmental Engineering); Environmental Engineering, Surface Water Quality, Watershed Management, Pollution Prevention, Sustainable Development

Robert W. Peters, Professor (Civil, Construction, and Environmental Engineering); Environmental Engineering, Water and Wastewater Treatment, Physical/Chemical Treatment, Soil and Ground Water

Remediation, Sonication/Acoustic Cavitations, Advanced Oxidation Processes, Water Chemistry, Energy Conservation; Sustainable Engineering Design

Talat F. Salama, Assistant Professor (Civil, Construction, and Environmental Engineering); Construction Engineering Management, Structural Engineering, Finite Element Modeling; Sustainable Engineering Design

Virginia P. Sisiopiku, Associate Professor (Civil, Construction, and Environmental Engineering); Traffic Engineering, Intelligent Transportation Systems, Traffic Operations, and Safety, Simulation Modeling

Nasim Uddin, Associate Professor (Civil, Construction, and Environmental Engineering); Structural Engineering, Structural Dynamics, Infrastructure Rehabilitation, Hazard Mitigation

Christopher J. Waldron, Assistant Professor (Civil, Construction, and Environmental Engineering) Structural Engineering, Bridge Design

Secondary Appointment Faculty

Heshmat Aglan, Professor & Associate Dean (Tuskegee University); Mechanical Engineering, Structural Mechanics, Polymer Modified Pavement

Ashraf Z. Al-Hamdan, Lecturer (University of Alabama in Huntsville); Subsurface Remediation, Contaminant Transport Modeling & Waste Resources Planning & Management

Bo Dowswell, PhD., P.E.; Structural and Steel Design, Shell Structures

Alan Eberhardt, Associate Professor (Biomedical Engineering); Solid Mechanics, Biomechanics, Analytical and Numerical Methods

Tarek El-Misalami, PhD, Assistant Professor (Misr University for Science and Technology, Cairo, Egypt); Construction Engineering Management

Joseph J. Gauthier, Associate Professor (Department of Biology); Applied and Environmental Microbiology

Wood Herren, Attorney at Law (Bradley Arant Law Firm); Corporate and International Law

Lee Moradi, PhD., PE, Director of Engineering (Center for Biophysical Sciences and Engineering); Structural Engineering and Analyst, Constitutive Properties of Concrete Masonry Units Subjected to Blast, System Performance and Design.

Loring Rue, Professor (Department of Surgery); Chief, Section of Trauma, Burns, and Surgical Critical Care (injury and crash injury research)

Edmund P. Segner, Jr., Professor Emeritus, (Civil, Construction, and Environmental Engineering); Structural Engineering, Structural Mechanics

Admission Requirements

In addition to the Graduate School admission requirements, requirements for admission to the program leading to the Master of Science in Civil Engineering degree include the following five criteria:

1. An undergraduate engineering degree from a program accredited by the Accreditation Board for Engineering and Technology (ABET). Applicants who do not meet this criterion but who have an outstanding academic record in an engineering degree program not accredited by ABET, or in a baccalaureate degree program in a related field, may be admitted on probation. Students admitted in this category will be required to complete a sequence of undergraduate courses in addition to the normal requirements of the M.S.C.E. degree. This set of extra requirements will be specified in writing at the time of admission to the program.

1. GPA of 3.0 or better (A = 4.0) in all undergraduate degree major courses attempted;

1. Three letters of evaluation concerning the applicant's previous academic and professional work; and

1. Submission of scores achieved on the GRE General Test. Admission to the program is competitive and is based on all available evidence; for admission in good academic standing, scores above 500 on each component of GRE General Test are preferred. Minimum scores of 550 on the Test of English as a Foreign Language (TOEFL) and a 3.5 on the Test of Written English (TWE) are also required for those applicants whose native language is not English. These test scores will be used primarily if an applicant fails to meet minimum standards for admission in good standing and is being considered for admission on probation.

1. Verification of registration by examination as a Professional Engineer (P.E.) will satisfy criteria 2, 3, and 4 above.

M.S.C.E. Program Requirements

The following minimum requirements apply to the plan of study for a student who has earned a baccalaureate degree in civil engineering. A student with an undergraduate degree in another field may also be accepted into the civil engineering program but will normally have to take additional preparatory coursework as part of an expanded plan of study. Continuous enrollment for at least 3 credit hours per term is required. Students receiving an assistantship are required to be enrolled as full-time students every semester. A full-time student is one who is enrolled in at least 9 credit hours per term. ***Enrollment in Civil Engineering Graduate Seminar (CE 641) is required at least once per academic year.***

Plan I (Thesis Option)

1. In addition to the general Graduate School requirements, the student must successfully complete at least 33 semester hours of graduate credit, including:

(a) A minimum of 18 semester hours in civil engineering;

(b) Up to 6 semester hours in disciplines outside civil engineering, such as other engineering disciplines, mathematics, biology, earth science, physics, urban affairs, or public health.

(c) A minimum of 9 hours of CE 699 - Masters Thesis Research.

2. The student must pass a comprehensive examination on the content of the program. This examination may be written, oral, or both and shall include an oral defense of a thesis.

Plan II (Nonthesis Option): Research/Design Emphasis

1. The student must successfully complete at least 33 semester hours of graduate credit including:

a) A minimum of 24 semester hours in civil engineering;

b) Up to 6 semester hours in disciplines outside civil engineering, such as; other engineering disciplines, mathematics, biology, earth sciences, physics, chemistry, or public health; and

c) A minimum of 3 hours of CE 698 – Nonthesis Research under the direction of the graduate study committee chair, resulting in a committee approved written report.

2. The student must pass a comprehensive examination on the content of the program. This examination may be written, oral, or both and shall include an oral defense of the nonthesis research project.

Areas of Specialization

Specialization programs are available in the fields of environmental engineering, structural engineering/structural mechanics, construction engineering management; and transportation engineering. Supporting courses are offered in geotechnical engineering, optimization, engineering law and other areas. ***Enrollment in the Civil Engineering Graduate Seminar series (CE 641/741) is required of all graduate students at least once per academic year.***

Required Courses for Specialization in Environmental Engineering

In addition to the M.S.C.E. program requirements, the following undergraduate classes (plus all associated prerequisites) are generally required of all M.S.C.E. students specializing in environmental engineering:

CE 236 Environmental Engineering

CE 337 Hydraulics

CE 344 Civil Engineering Analysis

CE 430 Water Supply and Drainage Design

or

CE 480 Water and Wastewater Treatment

Required Courses for Specialization in Structural Engineering/Structural Mechanics

In addition to the M.S.C.E. program requirements, the following undergraduate classes (plus all associated prerequisites) are generally required of all M.S.C.E. students specializing in structural engineering/structural mechanics:

CE 332 Soil Engineering

CE 344 Civil Engineering Analysis

CE 360 Structural Analysis

CE 450 Structural Steel Design

CE 455 Reinforced Concrete Design

Required Courses for Specialization in Construction Engineering Management

In addition to the M.S.C.E. program requirements, the following undergraduate classes (plus all associated prerequisites) are generally required of all M.S.C.E. students specializing in construction management.

CE 395 Engineering Economics

CE 497 Construction Engineering Management

Required Courses for Specialization in Transportation Engineering

In addition to the M.S.C.E. program requirements, the following undergraduate classes (plus all associated prerequisites) are generally required of all M.S.C.E. students specializing in transportation engineering.

CE 344 Civil Engineering Analysis

CE 345 Transportation Engineering

Ph.D. Programs

This is a joint program with the University of Alabama in Huntsville (UAH). A typical student entering the program would already have a degree in Civil Engineering from an ABET accredited program. Students with outstanding records in related fields or from a non-accredited engineering program will be considered for admission on conditional standing, and must remedy deficiencies in their preparation after the start of their academic program. They may then be granted unconditional standing in the doctoral program.

The program requires 48 credit hours of coursework beyond the baccalaureate level or 24 credit hours of coursework beyond the master's degree, plus a minimum of 24 credit hours of dissertation research. ***Enrollment in the Civil Engineering Graduate Seminar (CE 741) at least once per academic year is required.*** A minimum of 6 credit hours must be taken from the UAH campus, and may be taken through the Intercampus Interactive Telecommunications (IITS) System here at UAB, Distance Learning courses from UAH (DL) or Web-based Instruction from UAH.

A comprehensive examination is required of all doctoral candidates. This examination is given after (a) all coursework is completed, and (b) the student's Graduate Committee, which consists of faculty representatives from both campuses, deems the student to have adequate preparation in the major and minor fields of study. The examination is conducted by the student's Graduate Committee and

administered on the resident campus. The examination consists of a written part and an oral part. During the oral portion of the examination, the student also presents his/her dissertation proposal. The Comprehensive Examination may only be taken twice.

For additional details, please refer to the CCEE website: http://www.eng.uab.edu/cee

Additional Information

For detailed information, contact Jennifer A. Vinson, Administrative Associate (jav@uab.edu), UAB Department of Civil, Construction, and Environmental Engineering, HOEN 140, 1530 3rd Ave., S., Birmingham, AL 35294-4440. Physical location: 140 Hoehn Building, 1075 13th Street South, Birmingham, AL, Telephone # (205) 934-8430.

CE Specialty Certificate Program

Category A certificates are offered by the Civil, Construction, and Environmental Engineering Department. Any undergraduate or graduate student in good standing who is pursuing a Civil Engineering degree (B.S.C.E., M.S.C.E., Ph.D.) may elect to simultaneously complete the requirements of his or her degree program and the Certificate Program. These certificates are listed on student transcripts and in the university graduation bulletin. Certificates can be earned in:

1. Construction Engineering Management

1. Sustainable Engineering Management

1. Structural Engineering

1. Environmental Engineering

1. Transportation Engineering

1. Geotechnical Engineering

Civil Engineering (B.S.C.E.) graduates who complete the Certificate Program will have greater depth in specific technical area. The certificates also allow a means for practicing engineers to acquire expertise beyond a Bachelor degree, and have it formally recognized, without completing a program leading to a

master's degree. This technical expertise will enhance their proficiency and marketability. Up to 12 graduate level credit hours taken for a certificate may be applied toward the M.S.C.E. degree.

Students who wish to pursue a CE Certificate must be admitted to the Department as either undergraduate or graduate students (B.S.C.E. or M.S.C.E. program). Students who are not currently enrolled in the civil engineering program may be admitted as a non-degree seeking student to earn a Certificate.

Certificates require a minimum of 15 semester hours. They consist of one required course (which may also count toward the B.S.C.E. degree at UAB) and four graduate level elective courses in the area of specialization. Courses that can be applied towards the Certificate can be found at www.eng.uab.edu/cee.

For more information, please contact Jennifer A. Vinson, Administrative Associate, 140 Hoehn Engineering Building, 1075 13th Street South, telephone (205) 934-8430, e-mail jav@uab.edu

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit.

Civil Engineering (CE)

Environmental Engineering

530. **Water Supply and Drainage Design**. Water requirements; wastewater characteristics. Hydraulics and design of sewers; distribution, and reuse of water. Development of water supplies; design considerations. Prerequisite: CE 337.

533. **Solid and Hazardous Waste Management**. Overview of waste characterizations, regulations, and management options.

534. **Air Quality Modeling and Monitoring**. Atmospheric pollutants, effects, reactions, and sources. Air pollution meteorology and dispersion modeling. Ambient monitoring.

537. **Environmental Experimental Design and Field Sampling**. Experimental design, sensitivity analyses, water sampling, and flow monitoring. Receiving water chemical reactions. Field investigations. Lecture and laboratory. Prerequisite: CE 344.

580. **Water and Wastewater Treatment**. Physical unit operations, and chemical / biological unit processes for water and wastewater treatment. Design of facilities for treatment. Treatment and disposal of sludge. Prerequisite: CE 236.

631. **Environmental Law**. Law as it applies to the practicing environmental engineer. New and emerging regulations.

632. **Industrial Water and Wastewater Treatment**. Solid wastes and wastewaters from various industries. Assessment of treatability, system design, and equipment selection. Prerequisite: CE 480.

636. **Stormwater Pollution Management**. Quality and quantity of stormwater. Receiving water problems and sources of pollutants. Runoff quality and quantity characterizations. Erosion control. Selection and design of controls; regulations. Prerequisite: CE 430.

638. **Water and Wastewater Chemistry**. Aquatic chemistry. Chemical behavior of pollutants in receiving waters. Fate of common pollutants. Chemical kinetics in natural waters. Photochemical reactions. Modeling of wastewater discharges. Prerequisite: ENH 601 or CH 235.

639. **Sediment Sources and Controls**. Erosion and sediment transport in urban areas; design of common erosion control practices. Prerequisite: CE 430.

640. **Wastewater Treatment Engineering**. Wastewater sources and characteristics. Design and operation of wastewater treatment facilities, including grit removal, oil and grease removal, dissolved air floatation, activated study process, trickling filters, and rotating biological contactors, stabilization ponds and aerated lagoons, anacrobic processes for wastewater treatment and sludge digestion. Ultimate disposal of wastewater residues and considerations of discharge criteria. Prerequisite: CE 480.

641. **Civil Engineering Graduate Seminar.** Seminar focusing on guest presentations of various civil, construction, and environmental engineering topics of interest for CE Masters students. Mandatory enrollment at least once per academic year. 1 hour.

681. **Environmental Chemistry**. Chemical equilibrium, acid/base, chemical concepts in pollutant behavior. Chemical kinetics, redox system, hydrolysis; pesticides, chemical wastes. Prerequisite: CE 638.

682. **Water Treatment Engineering**. Water sources and characteristics. Design and operation of water treatment facilities including lime softening operations, coagulation, flocculation, clarification, dissolved air flotation, filtration, disinfection, absorption, ion exchange, and sludge disposal. Prerequisite: CE 480.

683. **Water and Wastewater Treatment Processes Laboratory**. Construction and evaluation of bench-scale treatment processes. Treatability of water and wastewater. Coagulation of sedimentation, settleability of biological sludges, aerobic biological treatment, chemical treatment, water softening toxicity, disinfection; and sludge treatment processes. Prerequisite: CE 682.

685. **Engineering Hydrology**. Hydrologic principles: hydrologic cycle, precipitation data, stream flow measurements. Applications to engineering problems: stream flow analysis, watershed management. Prerequisite: CE 236.

686. **Engineering Hydrogeology**. Groundwater movement, natural quality, contamination, and restoration. Physical and chemical properties of groundwater. Well hydraulics and flow net analyses. Prevention and control of groundwater contamination. Prerequisites: CE 485 & MA 252.

687. **Stormwater Detention Pond Design**. Stormwater problems and control methods, urban hydrology prediction procedures for drainage and water quality studies. Detention pond design basics, limitations and multiple benefits. Prerequisite: CE 430.

731. **Environmental Law**. Law as it applies to the practicing environmental engineers. New and emerging regulations.

732. **Industrial Water and Wastewater Treatment**. Solid wastes and waste waters from various industries; assessment of treatability, system design and equipment selection. Prerequisite: CE 480.

736. **Stormwater Pollution Management**. Quality and quantity of urban stormwater. Receiving water problems and sources of pollutants. Runoff quality and quantity characterizations. Erosion control. Selection and design of controls; regulations. Prerequisite: CE 430.

738. **Water and Wastewater Chemistry**. Aquatic chemistry. Chemical behavior of pollutants in receiving waters. Fate of common pollutants. Chemical kinetics in natural waters. Photochemical reactions. Modeling of wastewater discharges. Prerequisite: ENH 601 or CH 235.

739. **Sediment Sources and Controls**. Erosion and sediment transport in urban areas; design of common erosion control practices. Prerequisite: CE **430**.

740. **Wastewater Treatment Engineering**. Wastewater sources and characteristics. Design and operation of wastewater treatment facilities, including grit removal, oil and grease removal, dissolved air floatation, activated study process, trickling filters, and rotating biological contactors, stabilization ponds and aerated lagoons, anacrobic processes for wastewater treatment and sludge digestion. Ultimate disposal of wastewater residues and considerations of discharge criteria. Prerequisite: CE 480.

741. **Civil Engineering Graduate Seminar.** Seminar focusing on guest presentations on various civil, construction, and environmental engineering topics of interest for CE Ph.D. students. Mandatory enrollment at least once per academic year. 1 hour.

781. **Environmental Chemistry**. Chemical equilibrium, acid/base, chemical concepts in pollutant behavior. Chemical kinetics, redox system, hydrolysis, pesticides, chemical wastes. Prerequisite: CE 638 or CE 738.

782. **Water Treatment Engineering**. Water sources and characteristics. Designs and operation of water treatment facilities including lime softening operations, coagulation, flocculation, clarification, dissolved air flotation, filtration, disinfection, adsorption, ion exchange, and sludge disposal. Prerequisite: CE 480.

783. **Water and Wastewater Treatment Processes Laboratory**. Construction and evaluation of bench-scale treatment processes. Treatability of water and wastewater. Coagulation of sedimentation, settleability of biological sludges, aerobic biological treatment, chemical treatment, water softening toxicity, disinfection, sludge treatment processes. Prerequisite: CE 682 or CE 782.

785. **Engineering Hydrology**. Hydrologic principles: hydrologic cycle, precipitation data, stream flow measurements. Applications to engineering problems; stream flow analysis, watershed management. Prerequisite: CE 236.

786. **Engineering Hydrogeology**. Groundwater movement, natural quality, contamination, and restoration. Physical and chemical properties of groundwater. Well hydraulics and flow net analyses. Prevention and control of groundwater contamination. Prerequisites: CE 485 & MA 252.

787. **Stormwater Detention Pond Design.** Stormwater problems and control methods, urban hydrology prediction procedures for drainage and water quality studies. Detention pond design basics, limitations and multiple benefits. Prerequisite CE 430.

Structural Engineering and Structural Mechanics

516. **Mechanical Vibrations**. Free and forced single-degree-of-freedom systems. Multiple-degree-of-freedom systems. Damped, forced two-degree-of-freedom systems. Single continuous systems. Prerequisites: CE 215 and CE 220.

520. **Advanced Mechanics**. Variation of stress at a point, including determination of principal and maximum shear stress. Basic problems involving symmetrical deformation; thick-wall cylinders, sphere, and rotating disk. Torsions of noncircular sections. Curved beams. Failure theories. Unsymmetrical bending, shear center. Prerequisites: CE 220.

526. **Foundation Engineering**. Application of principles of soil mechanics to determine bearing capacity and settlement of spread footings, mats, single piles and pile groups; site investigation, evaluate data

from field and laboratory tests; estimate stresses in soil masses; lateral resistance of piles and pile group; retaining walls, sheetpiles and coffer-dams. Prerequisite: CE 332 and CE 455.

553. **Design of Wood Structures**. Design and detailing of timber structures. Properties and specifications for dimension and glulam timbers. Design of beams, columns, beam-columns, connections (nails and bolts), roof diaphragms, and shear walls. Design of timber structures to meet the requirements of the National Design Specification standards. Prerequisite: CE 360.

554. **Design of Masonry Structures**. Design and detailing of masonry structures. Nomenclature, properties, and specifications for components. Design of assemblages, simple masonry structures, unreinforced and reinforced elements, and complex masonry structures. Prerequisite: CE 360.

556. **Prestressed Concrete Design**. Principles and concepts of design in prestressed concrete including elastic and ultimate strength analyses for flexural, shear, bond, and deflection. Principles of concordancy and linear transformation for indeterminate prestressed structures. Prerequisite: CE 455.

557. **Concrete Technology**. Properties of concrete in relation to specifying, purchasing and evaluating concrete materials. Fresh and hardened concrete properties. Concrete mix design procedures. Effects of finishing, curing, weather conditions, and various construction procedures. Ready mix concrete production and field placement techniques. Specification writing to ensure good quality concrete and field inspection procedures. Case studies of problems in concrete construction. Prerequisite: CE 222.

561. **Introduction to the Finite Element Method**. Concepts and applications of the finite element method. Development and applications of basic finite elements. Software use. Prerequisite: CE 220.

564. **Structural Dynamics**. Closed form and numerical solutions to single degree-of-freedom structural modals. Analysis of multistory frames. Computer applications and seismic analysis. Techniques of modal analysis. Prerequisites: CE 215 and CE 360.

567. **Wind and Seismic Loads**. Methods of calculating loads on structures caused by extreme winds and earthquakes. Calculation of wind loads on various types of structures according to theory and code. Determination of earthquakes loads on structures using structural dynamics and codes. Prerequisite: CE 360.

568. **Bridge Engineering**. Bridge loads, steel beam bridges, composite beam bridges, bridge bearings, reinforced and prestressed concrete slab and T-beam bridges, bridge evaluations and ratings, upgrade methodologies, computer applications. Prerequisites: CE 450 and CE 455.

612. **Theory of Elasticity**. Equations of linear reduction to plane stress, plane strain, and generalized plane strain. Airy and Love stress functions in solution of problems. Prerequisite: CE 220.

615. **Theory of Elastic Stability**. Static stability of bars, beams, trusses, and rigid frames. Dynamic stability of bars. Energy method applied to buckling problems. General theory of elastic stability. Prerequisite: CE 220.

617. **Theory of Plates and Shells**. Linear theory and solutions of plates of various shapes. Large deflection theory and solutions of rectangular and circular plates. Membrane and bending theories of shells. Solutions of problems in conical, cylindrical, and spherical shells. Prerequisite: CE 220.

641. **Civil Engineering Graduate Seminar.** Seminar focusing on guest presentations of various civil, construction, and environmental engineering topics of interest for CE Masters students. Mandatory enrollment at least once per academic year. 1 hour.

650. **Advanced Structural Steel Design**. Beams, columns, tension members, and connections; current research. Prerequisite: CE 450.

655. **Advanced Reinforced Concrete**. Beam, column, and slab actions; current research. Prerequisite: CE 455.

660. **Structural Mechanics**. Elastic beam deflections, beam columns, lateral torsional buckling, column stability, plastic design, plate bending, yield line theory. Prerequisite: CE 360.

662. **Advanced Structural Analysis**. Analysis of indeterminate structures using classical and matrix methods. Use of large-scale computer programs. Prerequisite: CE 360.

663. **Finite Element Methods**. Theory and applications in structural mechanics. Plane stress, plane strain, axisymmetric problems, solids, plates, shells, nonlinear systems. Prerequisite: CE 561.

712. **Theory of Elasticity**. Equations of linear reduction to plane stress, plane strain, and generalized plane strain. Airy and Love stress functions in solution of problems. Prerequisite: CE 220.

715. **Theory of Elastic Stability**. Static stability of bars, beams, trusses, and rigid frames. Dynamic stability of bars. Energy method applied to bucking problems. General theory of elastic stability. Prerequisite: CE 220.

717. **Theory of Plates and Shells**. Linear theory and solutions of plates of various shapes. Large deflection theory and solutions of rectangular and circular plates. Membrane and bending theories of shells. Solutions of problems in conical, cylindrical, and spherical shell. Prerequisite: CE 612 or CE 712.

741. **Civil Engineering Graduate Seminar.** Seminar focusing on guest presentations on various civil, construction, and environmental engineering topics of interest for CE Ph.D. students. Mandatory enrollment at least once per academic year. 1 hour.

750. **Advanced Structural Steel Design**. Beams, columns, tension members, and connections; current research. Prerequisite: CE 450.

755. **Advanced Reinforced Concrete**. Beam, column, and slab actions; current research. Prerequisite: CE 455.

763. **Finite Element Methods**. Theory and applications in structural mechanics. Plane stress, plane strain, axisymmetric problems, solids, plates, shells, nonlinear systems. Prerequisite: CE 561.

Transportation Engineering Courses

621. **Transportation Engineering Seminar.** Seminar focusing on student research and guest presentations of various topics of interest to Masters Transportation Engineering students. 1 hour.

622. **Traffic Flow Theory**. Microscopic and macroscopic traffic flow characteristics. Traffic flow analytical techniques including car following models, traffic stream models, shock wave analysis. Queuing analysis and gap acceptance. Simulation models for network analysis. Prerequisite: CE 345.

623. **Non-Motorized Transportation Design and Planning**. Urban planning principles that support non-motorized transportation, local bicycle or pedestrian plans, non-motorized transportation safety related considerations, non-motorized transportation design including traffic calming techniques, procedures for capacity analysis of pedestrian facilities.

624. **Simulations Models for Transportation Applications**. Basic concepts of simulation models for analysis and optimization of transportation systems. Experimentation with planning simulation models and traffic models for signal timing and capacity analysis. Prerequisite: CE 345.

625. **Intelligent Transportation Systems**. Legal, institutional and planning issues. system architecture, telecommunication technologies. Advanced user services, intermodal systems. Deployment programs, cost and benefit evaluation.

641. **Civil Engineering Graduate Seminar**. Seminar focusing on student research and guest presentations of various civil, construction, and environmental engineering topics of interest for CE Masters students. Mandatory enrollment at least once per academic year. 1 hour.

642. **Highway Materials and Construction**. Properties of materials used in highway construction. Construction methods and management. Prerequisites: CE 322 and CE 345.

643. **Pavement Design and Construction**. Analysis of stresses and strains in pavement systems. Design and construction of flexible and rigid pavement, base courses and subgrades. Effects of loading on pavement life. Prerequisites: CE 345.

644. **Civil Engineering Analysis**. Sampling and experimental design. Hypotheses testing. Decision analyses. Multiple regression analyses. Nonparametric methods. Analysis of experimental data in civil engineering research; hypothesis testing, regression, experimental design, nonparametrical analysis. Prerequisite: CE 344.

646. **Traffic Engineering Operations**. Highway and intersection capacity analysis, traffic signal timing and phasing, coordination, signal networks, freeway operations, nonsignalized traffic control techniques. Prerequisite: CE 345.

647. **Engineering Optimization and Modeling**. Mathematical techniques for analysis of systems. Project scheduling, optimization, and simulation applied to civil engineering system analysis. Prerequisite: CE 344, EE 130 or EE 134.

648. **Urban and Transportation Planning**. Land use planning for transportation systems; trip generation, trip distribution, and traffic assignment. Prerequisite: CE 345.

693. **Applied Research in Civil and Environmental Engineering**. Research tools, including elements of experimental design and proposal preparation. Effective communication, literature searches, and exploratory data analysis. Prerequisite: Permission of instructor.

721. **Transportation Engineering Seminar**. Seminar focusing on student research and guest presentations of various topics of interest to PhD. Transportation Engineering students. 1 hour.

722. **Traffic Flow Theory**. Microscopic and macroscopic traffic flow characteristics. Traffic flow analytical techniques including care-following models, traffic stream models, shock wave analysis. Queuing analysis and gap acceptance. Simulation models for network analysis. Prerequisite CE 345.

723. **Non-Motorized Transportation Design and Planning**. Urban planning principles that support non-motorized transportation, local bicycle or pedestrian plans, non-motorized transportation safety related considerations, non-motorized transportation design including traffic calming techniques, procedures for capacity analysis of pedestrian facilities.

724. **Simulation Models for Transportation Applications**. Basic concepts of simulation models for analysis and optimization of transportation systems. Experimentation with planning simulation models and traffic models for signal timing and capacity analysis. Prerequisite: CE 345.

725. **Intelligent Transportation Systems**. Legal, institutional and planning issues. System Architecture, telecommunication technologies. Advanced user services, intermodal systems. Deployment programs, cost and benefit evaluation.

741. **Civil Engineering Graduate Seminar**. Seminar focusing on guest presentations on various civil, construction, and environmental engineering topics of interest for CE PhD. students. Mandatory enrollment at least once per academic year. 1 hour.

Construction Engineering Management Courses

600. **Sustainable Construction**. Study of sustainable construction techniques and best practices. Provides an understanding of the interdependencies between planning, designing, building, operating, and demolishing the built environment and their impacts on the natural environment. Course topics will include: (1) Issues of recourse efficiency, economics, ethics, waste, human health, environmental justice, and industrial ecology; (2) Alternative practices that significantly reduce adverse environmental impacts of built infrastructures, and (3) Explore past and present thinking of engineering practitioners in this newly emerging discipline.

601. **Construction Methods.** This course provides an overview of construction methods, building systems, material and equipment used in the construction of buildings, earthwork, bridges and roads. Excavation, formwork, concrete, masonry, and steel erection methods. Types of foundations that can be used for a project are presented.

602. **Construction Contracting, Bidding, and Estimating.** Estimation of construction project costs: direct and indirect, labor, material, and equipment costs. Overhead and profit, bidding computer-based estimating. Introduction to the U.S. legal system as it applies to civil engineering and construction. Fundamental concepts of contract and tort law, claims, risk management, business formation and licensing, agency, insurance and bonding, and real property.

603. **Construction Accounting and Financial Management.** This course covers financial accounting and cost control concepts dealing with the integration and management of both company and project-level revenue and expense. It shows how effective cost control methodology and data is essential to monitoring and controlling current project budgets as well as developing accurate future bids. The course covers accounting systems unique to construction companies and financial analysis methods typically employed; progress payment disbursement; forecasting and trends; cash flow life cycle theory; computer applications; project funding; and the use of cost information and associated reports.

604. **International Construction Contracts and Law.** Provides an overview of the fundamental aspects of the law that affects construction and engineering companies as well as the project owners. Particular emphasis is placed on contract forms and provisions related to liability for engineering design and construction companies, the roles of the typical participation in the process, and dispute resolution. Required bonding and other risk allocation vehicles are discussed.

605. **Project Management.** This course presents the theory and practice of project management as a distinct discipline with applications in time, cost, and performance management. Managerial, organizational, behavioral and cost benefit aspects of project management are covered, as well as various applied models for organizing, executing, and monitoring a project. Basic estimating techniques to determine cost and time for construction work packages are discussed followed by scheduling model techniques to include the Critical path Method (CPM), Precedence Diagramming Method (PDM), Program Evaluation and Review Technique (PERT), and Gantt charts.

606. **Advanced Project Management.** Directed study of selected topics in construction management. The schedule of classes will list topics selected. Topics will include: business policy and problems relating to construction companies, contractors' organization, financial management, project management, supervision, costs analysis and equipment economics, team building, professional ethics, leadership and topics in construction law.

607. **Engineering Entrepreneurship.** The course focuses on the entrepreneurial engineer – a type of engineer who needs a broad range of business skills and knowledge above and beyond a strong science and engineering background. The course will introduce engineering students to the key aspects of engineering entrepreneurship including business planning, solving problems, risk taking, financing, marketing, and entrepreneurial leadership. The students will also be introduced to the many opportunities and challenges that accompany starting and operating an entrepreneurial venture. Entrepreneurial company leaders will present their experiences and share their leadership styles as part of the course.

608. **Green Building Design**. Quantitative introduction to the principles of “Green Building Design”. Provides students an understanding of the interdependencies between economics, technology, design, building occupation and the subsequent impact on the natural environment. Course will emphasize green building materials, new technologies, and sustainable construction methods. Course will also include LEED Case Studies (Industrial, commercial, residential, and institutional examples).

609. **Advanced Topics in Engineering Law.** The course will cover advanced topics in engineering law as it relates to sustainable design and construction practices. Examples include BIM, crane regulations, safety, international contracts and joint ventures, term sheets, etc.

610. **The Engineered Environment.** The course will cover the fundamental of environmental engineering as they apply to the construction of the built environment and contemporary issues faced by engineers in developing nations such as Egypt. Topics to be addressed include: air pollution, solid waste management, water treatment, environmental ethics, etc.

631. **Environmental Law**. Law as it applies to the practicing environmental engineer. New and emerging regulations.

649. **Engineering Liability.** Laws related to liability for engineering design in the context of projects liability and construction projects; roles and liabilities between various parties involved in construction projects.

658. **Engineering Management.** Management techniques for practicing engineers. Students will learn management and leadership skills, how to work in teams, as well as professional issues on ethics.

692. **Civil Engineering Capstone**. The course covers specific contemporary topics related to civil engineering practice and knowledge. Capstone project using case studies to apply skills, knowledge, techniques, and concepts developed in prior courses.

731. **Environmental Law**. Law as it applies to the practicing environmental engineer. New and emerging regulations.

749. **Engineering Liability.** Laws related to liability for engineering design in the context of products liability and construction projects, roles and liabilities between various parties involved in construction projects.

758. **Engineering Management**. Management techniques for practicing engineers. Students will learn management and leadership skills, how to work in teams, as well as professional issues on ethics.

Other Courses

690. **Special Topics in (Area)**. 3 hours.

691. **Individual Study in (Area)**. 3 hours.

698. **Nonthesis Research**. 3, 6, 9 hours.

699. **Thesis Research**. Prerequisite: Admission to candidacy. 3, 6, 9 hours.

790. **Special Topics in (Area)**. 3 hours.

791. **Individual Study in (Area)**. 3 hours.

798. **Nondissertation Research**. 3, 6, 9, 12 hours.

799. **Doctoral Dissertation**. Prerequisite: Admission to candidacy. 3, 6, 9, 12 hours.

Master in Engineering - Construction Management

The Department of Civil, Construction, and Environmental Engineering is pleased to announce its newest program, a Masters in Engineering – Construction Management. This graduate degree program is designed to enhance the engineering and business qualifications of working professionals interested in project and company management.

In addition to the Graduate School admission requirements, requirements for admission to the program leading to the Master in Engineering – Construction Management degree include the following:

1. Must have a Bachelors degree from an accredited U.S. College or University;

2. Must have an Undergraduate GPA of 3.0 or higher (individuals not meeting this requirement may start o a probationary status with strong interview and recommendations);

3. No GRE required for U.S. Citizens;

4. Must submit at least two letters of recommendation

5. Must schedule an interview with the Program director or coordinator.

6. Student must successfully complete at least 33 semester hours of graduate credit;

Master in Engineering - Construction Management Courses

The course listing below only applies to students who are enrolled in the Masters in Engineering – Construction Management program.

628. Construction Management Capstone Case Study, Part 1. Students review case studies involving project planning and risk assessment or individual topical study (1 hour).

629. Construction Management Capstone Case Study, Part 2. Students review case studies emphasizing project control and coordination or individual topical study (1 hour).

630. Construction Management Capstone Case Study, Part 2. Students review case studies emphasizing technology advancements in construction methods and project management, or individual topical study (1 hour).

669. Advanced Project Management. Skills generally required for sound project management in a variety of management settings are studied in addition to specific management issues typically associated with engineering and construction companies. A discussion of corporate organizational structures and the evolving use of project management processes helps establish an appreciation for the role of a Project Manager. The elements of a project and the role and responsibilities of the Project Manager are studied in depth. Students are also acquainted with risk management concepts, financial, labor, safety, equipment, contracting issues facing managers in the engineering and construction environment. Particular emphasis is placed on individual management strengths and weakness, team building, and characteristics of successful companies. One of the primary vehicles for discussion will be small case studies from real companies and the outside reading of one or two relevant topical books (3 hours).

670. Construction Estimating and Bidding. Provides an overview of typical construction delivery systems, and the planning and contracting associated with each. A broad study of estimating methodology ranging from rough ball park estimates to detailed unit pricing is presented focusing on labor, equipment, materials, subcontractors, job conditions, location, overhead and profit. This course is intended to establish a basic understanding of the estimating process, and therefore substantial course focus will be placed on the term group project which consists of the development of a bid estimate for a small construction project (3 hours).

671. Construction Liability and Contracts. Provides an overview of the fundamental aspects of the laws that affect construction and engineering companies as well as the project owners. Particular emphasis is placed on contract forms and provisions related to liability for engineering design and construction companies, the roles of the typical participation in the process, and dispute resolution (Prerequisites CE 669 and CE 670 or approval by the Project Director) (3 hours).

672. Construction Methods and Equipment. Provides students a big-picture understanding of the construction methods employed to bring the concepts and designs of architects and engineers to physical realty. The focus areas include earthmoving, heavy construction, building construction, and process plants. Students will understand the planning and deployment of equipment, materials, labor, and subcontractors required in the construction process. The course is strengthened with guest lectures from industry practitioners and student interaction with construction industry participants as parts of the group semester project. (Prerequisites: CE 669 or approval by the Program Director) (3 hours).

673. Techniques of Project Planning and Control. Provides a thorough understanding of the project scheduling process in construction planning and control. Students learn the relationship between the work breakdown structure, organization breakdown structure, and the activities used in developing project schedules. The Critical Path Method (PM) and the Precedence Diagram Method (PDM) are discussed in detail to include hand calculations and powerful computer software products. The use of scheduling techniques for project control, resources constraint management, cash flow management, and project completion date management are investigated and the importance of communications in the planning and controlling process emphasized. (Prerequistes: CE 669, and CE 670) (3 hours).

674. Overview of Green Building Design and Construction (LEED). This course provides an introduction to the emerging trends in green building sustainable design and construction. The course will include instruction suitable to prepare students for the Leadership in Energy and Environmental (LEED©) Green Building Rating System ™certification exam (Prerequisite: CE 672) (3 hours).

675. Fundamentals of Financial & managerial Accounting for Non-Financial Managers. Provides an extensive overview of accounting concepts for non-financial managers. Students will learn the basic elements of accounting (Generally Accepted Accounting Practices). They will understand typical financial records and financial statements are established for companies. Once the basics are understood, students will study how financial data is used for internal cost controlling, planning, and budgeting. (Prerequisite: CE 669, CE 670, CE 673, and CE 677) (3 hours).

676. Construction Project Risk Management. This course addresses the methodologies employed in the engineering and construction industries to assist in national decision making in the face of uncertainty. The course reviews the fundamentals of common probabilistic theories and models, data sampling, hypothesis testing and the basics of Bayesian Decision Theory. In addition, basic financial analysis tools will be reviewed. Theoretical models will then be applied to specific examples encountered in engineering and construction decision making with emphasis on engineering economics applications. (Prerequisites: CE 669, CE 670, and CE 673) (3 hours).

677. Accounting and Finance in Construction. Introduces students to some of the particular accounting needs, practices and methods unique to construction companies. Students will understand the details of budget preparation, cost tracking and reporting systems. Emphasis is placed on understanding the importance of linking detailed project planning, scheduling with cost accounting and reporting in the management of individual construction projects and the company as a whole. A broad overview of financial management of construction companies and the specific tools used to operate the enterprise are discussed. Business planning, financing and contracting strategies suitable for a cyclical demand industry are discussed (Prerequisites: Ce 669, CE 670, and CE 672) (3 hours).

678. Construction Business Systems and Information Technology. The use of information management systems design and construction operations is studied in detail. Emerging technology and state-of-the-art equipment and software will be discussed. The importance of information technology and equipment, and benefit cost tradeoffs for different company and project sizes will be discussed and investigated by students. A large portion of the course effort is the student group investigative topical research project and oral presentation (Prerequisites: CE 669, CE 670, and CE 672) (3 hours).

679. Construction Methods – Detailing and Finishing. This course is an extension of the concepts and technical terminology introduced in Construction Methods and Equipment. Topics explored in this course include green desing/sustainable constructin, finishing systems, windows and cladding, HVAC/plumbing, and roofing. The International Building Code will be examined, as well as, fundamental engineering, design, and construction methods. Upon completion students will be better equipped to read and understand drawings and specifications, necessary skills for detailed estimating of cost and time (Prerequisite: CE 671) (3 hours).

680. Construction Management Capstone Studies. Students review case studies involving project planning and risk assessment, or individual topical study, case studies emphasizing project control and coordination or individual topical study, case studies emphasizing technology advancements in construction methods and project management, or individual topical study (3 hour).

684. Construction Project Administration. This course is designed to provide a comprehensive overview of the important business, legal, and management aspects of construction management with emphasis on administrative procedures. The course is an extension of Advanced Project Management concepts with specific focus on the construction management issues facing owners, engineers, constructors, architects, and students. International business topics will also be discussed (Prerequisite: CE 669) (3 hours).

688. Strategic Management & Leadership Applications in a Global Environment. This course is designed to prepare students to face the demanding management and leadership challenges facing industry leaders as competition becomes ever more globalized. Strategic planning, management and leadership in the built environment requires savvy leaders with exceptionally developed analytical and communications skills suitable for multi-disciplinary and multi-national ventures. Organization design and management, selection and use of technology, and methodologies for measuring and monitoring performance are all fundamental working concepts necessary to think strategically in a changing world business environment. This course will provide the opportunity for students to discuss and research these concepts and to recognize the necessity to think independently, challenge conventional thinking, and visualize alternatives (3 hours).

689. Building Information Modeling (BIM) Techniques. This course provides students with an overview of the evolution of BIM Technology in the construction industry followed by hands-on training in the basic application of contemporary BIM Software. Students will learn basic modeling skills and how to produce graphical presentations. Advanced applications of BIM Technology will be discussed and demonstrated (3 hours).

694. Sustainable Construction. Provides students an understanding of the interdependencies between planning, designing, building, operating, and demolishing the built environment and their impacts on the natural environment. Course topics will include: (1) Issues of recourse efficiency, economics, ethics, waste, human health, environmental justice, and industrial ecology; (2) Alternative practices that significantly reduce adverse environmental impacts of built infrastructure, and (3) Explore past and present thinking of engineering practitioners in this newly emerging discipline (3 hours)

695. International Construction Contracts & Liability. Provides an overview of the fundamental aspects of the law that affects construction and engineering companies as well as the project owners. Particular emphasis is placed on contract forms and provisions related to liability for engineering design and construction companies, the roles of the typical participation in the process, and dispute resolution (3 hours)

Computer Engineering (Ph.D.*)

Degree Offered: Ph.D.

Director: Dr. Mohammad Haider

Phone: (205) 934-8440

E-mail: mrhaider@uab.edu

Web site: **www.uab.edu/engineering/graduate**

Faculty

Gregory A. Franklin, Assistant Professor (Electrical and Computer Engineering); Electric Utility Power Systems, Power System Protection and Control, Power Line Communication

Mohammad. R. Haider, Assistant Professor and Graduate Program Director (Electrical and Computer Engineering); Analog, Mixed-signal, and RF Circuit and System Design, Low-power Electronics, Implantable Systems, Inductive Powering, Energy Harvesting, Impulse-based Wireless Communication

Thomas C. Jannett, Professor (Electrical and Computer Engineering); Intelligent Control, Biomedical Instrumentation, Modeling and Simulation, Intelligent Sensor Networks

Karthikeyan Lingasubramanian, Assistant Professor (Electrical and Computer Engineering), Digital Integrated Circuits design, Design of Secure and Reliable VLSI Systems, Low Power Digital VLSI Design

Dalton Nelson, Assistant Professor (Electrical and Computer Engineering); Control systems, Fuzzy Logic, Intelligent Control, and Medical Instrumentation

Murat M. Tanik, Professor (Electrical and Computer Engineering); Software Systems Engineering, Integrated Systems Design, Process Engineering.Quantum Computing and Quantum Electrodynamics

Allen R. Tannenbaum, Professor and Interim Chair (Electrical and Computer Engineering); Systems and Control; Image Processing, Computer Vision, Medical Imaging

Gregg L. Vaughn, Professor (Electrical and Computer Engineering); Digital Signal Processing, Applications of Microprocessors, Digital Communication

See the graduate catalog of the University of Alabama at Huntsville (UAH) for the Electrical and Computer Engineering faculty of that university.

Program Information

The Ph.D. degree prepares students for professional and research careers in industry and academia. The Ph.D. in Computer Engineering is awarded by UAB and is offered through a program shared with the University of Alabama in Huntsville (UAH), allowing both UAB and UAH to contribute to the program.

Admission Requirements

Requirements for admission to the Ph.D. program include the following:

1. A bachelor's degree in an accredited electrical or computer engineering program or a bachelor's degree in a related program acceptable to the graduate faculty in Electrical and Computer Engineering;

2. A score of at least 550 on the verbal and quantitative sections of the Graduate Record Examination (GRE);

3. An acceptable score on the TOEFL examination for international students whose native language is not English;

4. An overall GPA of at least 3.0 on a 4.0 point scale, or at least 3.0 for the last 60 semester hours completed; and

5. Three letters of evaluation concerning the applicant's previous academic and professional work.

Students not having a bachelor's degree in electrical or computer engineering may be required to complete prerequisite courses.

Financial Support

Fellowships and/or assistantships may be available for well-qualified students admitted into the PhD program. In order to be considered for financial aid for the coming academic year, the completed application materials must usually be received at UAB by April 1.

There are a number of minority fellowships available through the Graduate School. Contact the UAB Graduate School directly for further information.

Program Requirements

The course of study leading to the Ph.D. includes a minimum of 48 semester hours of course work beyond the bachelor's degree (excluding dissertation research). A student's advisory committee may allow appropriate course work pursued in completing a master's degree to be counted towards the 48 hour course work requirement, but a maximum of nine semester hours credit in thesis/research work from the master's degree may be allowed to count toward the 48 hour course work requirement for the Ph.D. Requirements include the following:

1. A major consisting of a minimum of 18 semester hours of approved coursework in computer engineering;

2. A minor consisting of a minimum of 12 semester hours of approved coursework in mathematics, theoretical or formal methods as related to computer engineering;

3. A minor consisting of a minimum of 12 semester hours of approved coursework in electrical or computer engineering;

4. Additional coursework consisting of a minimum of 6 semester hours of approved coursework in supportive fields;

5. Successful completion of a preliminary examination;

6. Successful completion of a qualifying examination that includes a presentation of the dissertation research proposal. Successful completion of the qualifying examination leads to admission to candidacy;

7. Successful completion of a minimum of 18 semester hours in EE 799-Dissertation Research); and

8. Successful completion of a final examination on the dissertation.

Additional Information

Deadline for Entry Term(s):	Each semester
Deadline for All Application Materials to be in the Graduate School Office:	Six weeks before term begins
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)
Graduate Catalog Description	**www.uab.edu/**engineering/graduate

For detailed information, contact

Dr. Mohammad Haider Graduate Program Director

UAB Department of Electrical and Computer Engineering. BEC 255E

1720 Second Avenue South, Birmingham, Alabama 35294-1170.

Telephone 205-934-8440

E-mail **ElecCompEng@uab.edu**

Web **www.uab.edu/engineering/graduate**

Course Descriptions

See the graduate catalog of the University of Alabama at Huntsville (UAH) for doctoral courses that university.

See the listing for the master's degree in electrical engineering (M.S.E.E.) for courses at the 500 level.

Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

Electrical and Computer Engineering (EE)

601. **Electrical and Computer Engineering Seminar.** Research presentations delivered by faculty, students, and invited guests. Technical writing and development of verbal presentations. Writing a research paper. Maximum of 3 credit hours applicable toward the M.S.E.E. degree. Prerequisite: permission of instructor. 1-3 hours.

610. **Technical Communication for Engineers.** Workshop-oriented course producing technical memoranda, proposals, and conference and/or refereed-journal papers with oral presentations related to these work products. Prerequisite: Graduate standing in Engineering and successful performance on a written pretest.

621. **Random Variables and Processes**. Theory underlying analysis and design of communication, stochastic control, data gathering, and data analysis systems. Prerequisite: Coursework in communication systems or permission of instructor.

622. **Advanced Communication Theory**. Analysis of performance of analog modulation techniques in presence of noise. Prerequisites: Coursework in communication systems and random variables and processes.

624. **Digital Communication**. Design of digital communication systems. Prerequisites: Coursework in communication systems and random variables and processes.

625. **Coding and Information Theory**. Entropy, channels and channel capacity, RLL codes, error correcting codes, cyclic codes, cryptography, convolutional codes, trellis coded modulation. Prerequisite: Coursework in random variables and processes.

626. **Digital Image Processing**. Digital image processing fundamentals, image transformations, image enhancement, image restoration, image compression, image segmentation, and image presentation. Prerequisite: Coursework in systems analysis.

628. **Telecommunications I**. Advanced topics. Prerequisite: Permission of instructor.

629. **Telecommunications II**. Advanced topics. Prerequisite: Permission of instructor.

632. **Introduction to Computer Networking**. Computer networking fundamentals. Layered network model and correspondence to real systems. Discussion of Ethernet, token ring, TCP/IP LAN and other protocols. Exploration of Internet and similar systems. Network application models. Simulation of networks. Permission of instructor.

633. **Experiments in Computer Networking**. Detailed exploration of particular issues in network protocols and network application models. Development of series of programs to explore the details of network protocols and network application models. Prerequisite: Coursework in computer networking including TCP/IP protocols.

635. **Telecommunication Systems**. System organization and structure. Data transmission. Prerequisite: Permission of instructor.

639. **Advanced Microprocessors**. Topics covering both hardware and software issues. Individual or group term project. Prerequisite: Permission of instructor.

640. **Object-Oriented Design**. Study and practice of the object-oriented methodology for developing software designs. Implementation consequences. Application of object-oriented methodologies to specific problems using object-oriented language. Prerequisite: Coursework in object-oriented programming.

641. **Modern Control I.** Discrete-time and sampled-data and systems. State variable models, state feedback and estimation. Optimal control and estimation. Predictive control.. Prerequisite: Coursework in control systems or permission of instructor.

642. **Intelligent Systems**. Organization and characteristics of intelligent systems. Optimization. Evolutionary algorithms. Neural network and fuzzy logic algorithms. Intelligent control. Prerequisite: Permission of instructor.

643. **System Identification and Adaptive Control**. Modeling of systems using structure identification, parameter estimation, and model validation. Controller design based on input-output models. Parameter adaptive control. Prerequisite: Permission of instructor.

650. **Software Engineering**. Introduces classical software lifecycles and software development paradigms. Provides state of the art practical experience in proposal development and software design. Develops integrated skills drawing experience from computer engineering, computer science, communication, systems engineering, and problem solving. Prerequisite: Permission of instructor.

651. **Software Engineering Large Systems I.** Introduces advanced integrated software systems development paradigms. Notions of process and integrated system views. Modeling-in-the-large and modeling-in-the-small are discussed and related to levels in Object Oriented Design and programming. Prerequisite: Permission of instructor.

652. **Software Engineering Large Systems II**. Builds on the advanced **integrated software systems development paradigms.** Components are introduced as elements of large system implementations. In the context of a design taxonomy, advanced Object-Oriented design and development techniques are reviewed. Prerequisites: Permission of instructor.

657. **Enterprise Information Architecture Engineering.** Study and practice of the enterprise architecture engineering for developing multi-tiered enterprise level systems. Methodologies for design and implementation of large-scale information systems. Distributed computing, clients, servers, operating systems and databases. Prerequisite: Permission of instructor.

661. **Advanced Electrical Machinery I. Synchronous machine theory. Prerequisites: Permission of** instructor.

662. **Advanced Electrical Machinery II**. Induction machine theory. Prerequisite: Permission of instructor.

663. **Control of Synchronous Machines**. Methods for control of synchronous machines. Prerequisite: Permission of instructor.

671. **Computer Applications in Power Systems**. Analysis of power systems operation. Prerequisite: Permission of instructor.

672. **Power System Overvoltages**. Events causing overvoltages. System protection. Prerequisite: Permission of instructor.

673. **Reliability of Power Systems**. Component reliability using standard industrial techniques. Prerequisite: Permission of instructor.

674. **Economic Operation and Control of Power Systems**. Economic control of thermal generating stations and hydrothermal stations. Computer control of power systems. Prerequisite: Permission of instructor.

*690. **Special Topics in (Area)**. Prerequisite: Permission of instructor. 1-12 hours.

*691. **Special Problems in (Area)**. Prerequisite: Permission of instructor. 1-12 hours.

*697. **Project.** Graduate project for Plan II Master's students. Prerequisite: Permission of instructor. 3 hours.

*698. **Nonthesis Research**. Does not count towards a degree. 1-12 hours.

*699. **Master's Thesis**. Master's thesis for Plan I Master's students. Prerequisite: Admission to candidacy. 1-12 hours.

701. **Electrical and Computer Engineering Seminar**. Research presentations delivered by faculty, students, and invited guests. Technical writing and development of verbal presentations. Writing a research paper. Maximum of 3 credit hours applicable toward the Computer Engineering Ph.D. degree. Prerequisite: permission of instructor. 1-3 hours.

724. **Digital Communications**. Design of digital communications systems. Prerequisites: Coursework in communication systems and random variables and processes.

725. **Coding and Information Theory**. Entropy, channels and channel capacity, RLL codes, error correcting codes, cyclic codes, cryptography, convolutional codes, trellis coded modulation. Prerequisite: Coursework in random variables and processes.

726. **Digital Image Processing**. Digital image processing fundamentals, image transformations, image enhancement, image restoration, image compression, image segmentation, and image presentation. Prerequisite: Coursework in systems analysis.

728. **Telecommunications I**. Advanced topics. Prerequisite: Permission of instructor.

729. **Telecommunications II**. Advanced topics. Prerequisite: Permission of instructor.

733. **Experiments in Computer Networking**. Detailed exploration of particular issues in network protocols and network application models. Development of series of programs to explore the details of network protocols and network application models. Prerequisite: Coursework in computer networking including TCP/IP protocols.

740. **Object-Oriented Design**. Study and practice of the object-oriented methodology for developing software designs. Implementation consequences. Application of object-oriented methodologies to specific problems using object-oriented language. Prerequisite: Coursework in object-oriented programming.

742. **Intelligent Systems**. Organization and characteristics of intelligent systems. Optimization. Evolutionary algorithms. Neural network and fuzzy logic algorithms. Intelligent control. Prerequisite: Permission of instructor.

743. **System Identification and Adaptive Control**. Modeling of systems using structure identification, parameter estimation, and model validation. Input/output models. Parameter adaptive control. Prerequisite: Permission of instructor.

750. **Software Engineering**. Introduces classical software lifecycles and software development paradigms. Provides state of the art practical experience in proposal development and software design. Develops integrated skills drawing experience from computer engineering, computer science, communication, systems engineering, and problem solving. Prerequisite: Permission of instructor.

751. **Software Engineering Large Systems I.** Introduces advanced integrated software systems development paradigms. Notions of process and integrated system views. Modeling-in-the-large and modeling-in-the-small are discussed and related to levels in Object Oriented Design and programming. Prerequisite: Permission of instructor.

752. **Software Engineering Large Systems II**. Builds on the advanced **integrated software systems development paradigms.** Components are introduced as elements of large system implementations. In the context of a design taxonomy, advanced Object-Oriented design and development techniques are reviewed. Prerequisites: Permission of instructor.

761. **Advanced Electrical Machinery I. Synchronous machine theory. Prerequisites: Permission of** instructor.

762. **Advanced Electrical Machinery II**. Induction machine theory. Prerequisite: Permission of instructor.

763. **Control of Synchronous Machines**. Methods for control of synchronous machines. Prerequisite: Permission of instructor.

771. **Computer Applications in Power Systems**. Analysis of power systems operation. Prerequisite: Permission of instructor.

772. **Power System Overvoltages**. Events causing overvoltages. System protection. Prerequisite: Permission of instructor.

773. **Reliability of Power Systems**. Component reliability using standard industrial techniques. Prerequisite: Permission of instructor.

774. **Economic Operation and Control of Power Systems**. Economic control of thermal generating stations and hydrothermal stations. Computer control of power systems. Prerequisite: Permission of instructor.

*790. **Special Topics in (Area)**. 1-12 hours.

*791. **Individual Study in (Area)**. 1-12 hours.

*798. **Nondissertation Research**. Does not count towards a degree.1-12 hours.

*799. **Dissertation Research**. Prerequisite: Admission to candidacy. 1-12 hours.

Electrical Engineering (Ph.D.*, M.S.E.E.)

Degree Offered:	M.S.E.E.
Director:	Mohammad Haider
Phone:	(205) 934-8440
E-mail:	mrhaider@uab.edu
Web site:	**www.uab.edu/engineering/graduate**

Faculty

Dale W. Callahan, Associate Professor (Electrical and Computer Engineering); Wireless Communication, Digital Signal Processing, Telecommunication

David A. Conner, Professor and Chair Emeritus (Electrical and Computer Engineering); Electrical Networks, Electromagnetics, Mathematical Modeling of Electrical Phenomena

Gregory A. Franklin, Assistant Professor (Electrical and Computer Engineering); Electric Utility Power Systems, Power System Protection and Control, Power Line Communication

David G. Green, Instructional Associate Professor (Electrical and Computer Engineering); Computer Networking, Software Engineering, Embedded Computer Systems

Mohammad. R. Haider, Assistant Professor and Graduate Program Director (Electrical and Computer Engineering); Analog, Mixed-signal, and RF Circuit and System Design, Low-power Electronics, Implantable Systems, Inductive Powering, Energy Harvesting, Impulse-based Wireless Communication

Thomas C. Jannett, Professor (Electrical and Computer Engineering); Control Systems, Biomedical Instrumentation, Modeling and Simulation, Intelligent Sensor Networks

Karthikeyan Lingasubramanian, Assistant Professor (Electrical and Computer Engineering), Digital Integrated Circuits design, Design of Secure and Reliable VLSI Systems, Low Power Digital VLSI Design

Jon R. Marstrander, Instructor (Electrical and Computer Engineering); Electronics, Digital Systems, Digital Signal Processing, Image Processing

Dalton Nelson, Assistant Professor (Electrical and Computer Engineering); Control systems, Fuzzy Logic, Intelligent Control, and Medical Instrumentation

Allen R. Tannenbaum, Professor and Interim Chair (Electrical and Computer Engineering); Systems and Control; Image Processing, Computer Vision, Medical Imaging

Murat M. Tanik, Professor (Electrical and Computer Engineering); Software Systems Engineering, Integrated Systems Design, Process Engineering, Quantum Computing and Quantum Electrodynamics

Gregg L. Vaughn, Professor (Electrical and Computer Engineering); Digital Signal Processing, Applications of Microprocessors, Digital Communication

Program Information

The Master of Science in Electrical Engineering (M.S.E.E.) prepares students for a professional career in industry or entry into a doctoral program or professional school. The M.S.E.E. program builds upon the broad foundation provided by a Bachelor of Science in Electrical Engineering by supplying depth in specific areas of electrical and computer engineering through advanced coursework and a thesis or project experience.

Admission Requirements

Requirements for admission to the electrical engineering master's degree program include the following:

1. A bachelor's degree in electrical or computer engineering.
2. A 3.0 (A = 4.0) or better GPA in all junior and senior electrical and computer engineering and mathematics courses attempted;
3. Three letters of evaluation concerning the applicant's previous academic and professional work; and
4. An acceptable score on the GRE General Test and the TOEFL, if applicable.

Financial Support

Limited financial assistance may be available for well-qualified students admitted into the M.S.E.E. program. In order to be considered for financial aid for the coming academic year, the completed application materials must usually be received at UAB by April 1.

There are a number of minority fellowships available through the Graduate School. Contact the UAB Graduate School directly for further information.

Program Requirements

Assuming that a student possesses appropriate academic preparation for this degree, 33 semester hours of course work will be required beyond the bachelor's degree. This work must be distributed as follows:

Plan I (Thesis Option)

1. Twelve semester hours of graduate-level courses appropriate to the student's area of technical specialization;
2. Six semester hours of graduate-level courses in an area related to the student's area of technical specialization; and
3. Six semester hours of courses having a mathematical emphasis; and
4. Successful completion and oral defense of a thesis developed through registration for at least nine semester hours of EE 699.

Plan II (Nonthesis Option)

1. Twelve semester hours of graduate-level courses appropriate to the student's area of technical specialization;

2. Twelve semester hours of graduate-level courses in an area related to the student's area of professional emphasis (these courses may address technical subjects or subject matter appropriate to an emphasis in engineering management or entrepreneurship);

3. Six semester hours of courses having a mathematical emphasis; and

4. Successful completion of a project developed through registration for at least 3 semester hours of EE 697.

Additional Information

Deadline for Entry Term(s):	Fall, Spring, Summer
Deadline for All Application Materials to be in the Graduate School Office:	Six weeks before term begins
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)
Comments	GRE and evaluation forms requirements waived for persons holding registration as professional engineers
Graduate Catalog Description	**www.uab.edu/engineering/graduate**

For detailed information, contact

Dr. Mohammad Haider, Graduate Program Director
UAB Department of Electrical and Computer Engineering. BEC 255E
1720 Second Avenue South, Birmingham, Alabama 35294-1170.

Telephone 205-934-8440

E-mail mrhaider@uab.edu

Web **www.uab.edu/engineering/graduate**

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

Electrical and Computer Engineering (EE)

518. **Wireless Communications**. Wireless communication system topics such as propagation, modulation techniques, multiple access techniques, channel coding, speech and video coding, and wireless computer networks. Prerequisite: Coursework in systems analysis or permission of instructor.

523. **Digital Signal Processing**. Digital filter analysis and design. FFT algorithms. Applications of digital signal processing in engineering problems such as data acquisition, control, and I/O. Lecture and computer laboratory. Prerequisite: Coursework in systems analysis or permission of instructor.

527. **Industrial Control**. Power control devices and applications. Relay logic and translation to other forms. Programmable logic controllers. Proportional-integral-derivative and other methods for control techniques. Modern laboratory instrumentation and man-machine interface software. Lecture and laboratory. Prerequisites: Coursework in programming, systems analysis, and basic electronics, or permission of instructor.

531. **Analog Integrated Electronics**. Advanced analysis and design using op-amps, with emphasis on error analysis and compensation. Applications include signal conditioning for instrumentation, instrumentation amplifiers, nonlinear and computational circuits, Butterworth and Chebyshev filter design, power amplifier design, voltage regulator design, and oscillators. A-to-D and D-to-A conversion methods. Laboratory exercises emphasize design techniques. Lecture and laboratory. Prerequisites: Coursework in systems analysis and basic electronics, or permission of instructor. 4 hours.

532. **Introduction to Computer Networking**. Computer networking and engineering standards related to networking. Networking hardware, software, and protocols including TCP/IP protocol suite. Internetworking, LANs, and typical applications. Required use of computer laboratory's networking. Lecture and computer laboratory. Prerequisites: Coursework in programming and digital logic.

533. **Engineering Software Solutions**. Project planning, specification, design, implementation, and testing of software solutions for engineers. Waterfall model of development and agile development methods.Lecture and computer laboratory. Prerequisite: Coursework in object-oriented programming or permission of instructor.

537**. Microprocessor Applications.** Application of microprocessors in engineering problems such as data acquisition, control, and real-time input/output. Lecture and laboratory. Prerequisite: Coursework in microprocessors and assembly language programming, or permission of instructor.

538. **Intermediate Microprocessors**. Advanced microprocessor topics including cache design, pipelining, superscalar architecture, design of control units, microcoding, and parallel processors.

Comparison of advanced contemporary microprocessors. Prerequisite: Coursework in microprocessors and assembly language programming, or permission of instructor.

542. **Computer Networking Protocols.** Hands-on laboratory course covering topics in networking. TCP/IP, routing, LAN configurations, Windows and Linux configurations, protocol analysis. Lecture and computer laboratory. Prerequisite: Coursework in networking.

544. Real-Time Process and Protocols. Hands-on laboratory course covering topics in real-time computer systems such as algorithms, state-machine implementations, communication protocols, instrumentation, hardware interfaces, multitasking, and interrupt handling.Prerequisite: Coursework in programming and microcomputers.

547. **Internet/Intranet Application Development.** Development of model and applications using Internet/Intranet technologies such as Java, JavaScript, Dynamic HTML, server side scripting, multi-tier models, and XML. Lecture and computer laboratory. Prerequisite: Coursework in object-oriented programming or permission of instructor.

548. **Software Engineering Projects.** Object-Oriented concepts and design. Unified Modeling Language and Design Patterns. Provides a project environment for implementation of systems using object-oriented techniques. Lecture and computer laboratory. Prerequisite: Coursework in object-oriented programming or permission of instructor.

552. **VHDL Digital Systems Design**. Digital system design, verification, and simulation using VHDL. Lecture and laboratory. Prerequisite: Coursework in microprocessors and assembly language programming.

558. **Medical Instrumentation**. Fundamental operating principles, applications, and design of electronic instrumentation used in measurement of physiological parameters. Class design project. Prerequisite: Coursework in electronics.

561. **Machinery II**. Physical principles of DC machines. Mathematical analysis of generator designs using equivalent circuits and magnetization curves. Calculation of motor speed, torque, power, efficiency, and starting requirements. Solid-state speed control systems. Prerequisite: Coursework in electrical machinery.

571. **Power Systems I**. Components of power systems. Performance of modern interconnected power systems under normal and abnormal conditions. Calculation of inductive and capacitive reactances of three-phase transmission lines in steady state. Prerequisite: Coursework in electrical machinery.

572. **Power Systems II**. Modeling of generators, transformers, and transmission lines for system studies. Introduction to symmetrical components. Calculation of short-circuit currents due to balanced and unbalanced faults. Determination of interrupting ratings of circuit breakers. Transient stability of power systems. Derivation of swing equation and solution by numerical method. Equal area criterion. Power system design project required. Prerequisite: Permission of instructor.

573. **Protective Relaying of Power Systems**. Symmetrical components, sequence networks, and short-circuit calculations. Instrument transformers and their performance under fault conditions. Protective devices and protective relaying units. Protection schemes and relay coordination for transformers, transmission lines, buses, and generators. Prerequisite: Coursework in electrical machinery.

574. **Industrial Power Systems**. One-line diagrams/load analysis. Medium and low voltage feeder design, voltage regulation, and short-circuit analysis. Selection of protective devices. Grounding and lightning protection. Term project. Prerequisite: Permission of instructor.

585. **Engineering Operations**. Economic, procedural, planning, and control aspects of engineering projects. Ethics and Civic Responsibility are significant components of this course (QEP). Prerequisite: Permission of instructor.

*590. **Special Topics in (Area)**. Prerequisite: Permission of instructor. 1-12 hours.

*591. **Special Problems in (Area)**. Prerequisite: Permission of instructor. 1-12 hours.

*595. **Integrated System Design**. Successful completion and oral defense of a team design project. Prerequisite: Permission of instructor.

601. **Electrical and Computer Engineering Seminar.** Research presentations delivered by faculty, students, and invited guests. Technical writing and development of verbal presentations. Writing a research paper. Maximum of 3 credit hours applicable toward the M.S.E.E. degree. Prerequisite: permission of instructor. 1-3 hours.

610. **Technical Communication for Engineers.** Workshop-oriented course producing technical memoranda, proposals, and conference and/or refereed-journal papers with oral presentations related to these work products. Prerequisite: Graduate standing in Engineering and successful performance on a written pretest.

621. **Random Variables and Processes**. Theory underlying analysis and design of communication, stochastic control, data gathering, and data analysis systems. Prerequisite: Coursework in communication systems or permission of instructor.

622. **Advanced Communication Theory**. Analysis of performance of analog modulation techniques in presence of noise. Prerequisites: Coursework in communication systems and random variables and processes.

624. **Digital Communications**. Design of digital communication systems. Prerequisites: Coursework in communication systems and random variables and processes.

625. **Coding and Information Theory**. Entropy, channels and channel capacity, RLL codes, error correcting codes, cyclic codes, cryptography, convolutional codes, trellis coded modulation. Prerequisite: Coursework in random variables and processes.

626. **Digital Image Processing**. Digital image processing fundamentals, image transformations, image enhancement, image restoration, image compression, image segmentation, and image presentation. Prerequisite: Coursework in systems analysis.

628. **Telecommunications I**. Advanced topics. Prerequisite: Permission of instructor.

629. **Telecommunications II**. Advanced topics. Prerequisite: Permission of instructor.

632. **Introduction to Computer Networking**. Computer networking fundamentals. Layered network model and correspondence to real systems. Discussion of Ethernet, token ring, TCP/IP LAN and other protocols. Exploration of Internet and similar systems. Network application models. Simulation of networks. Permission of instructor.

633. **Experiments in Computer Networking**. Detailed exploration of particular issues in network protocols and network application models. Development of series of programs to explore the details of network protocols and network application models. Prerequisite: Coursework in computer networking including TCP/IP protocols.

635. **Telecommunication Systems**. System organization and structure. Data transmission. Prerequisite: Permission of instructor.

639. **Advanced Microprocessors**. Topics covering both hardware and software issues. Individual or group term project. Prerequisite: Permission of instructor.

640. **Object-Oriented Design**. Study and practice of the object-oriented methodology for developing software designs. Implementation consequences. Application of object-oriented methodologies to specific problems using object-oriented language. Prerequisite: Coursework in object-oriented programming.

641. **Modern Control I.** Discrete-time and sampled-data and systems. State variable models, state feedback and estimation. Optimal control and estimation. Predictive control.. Prerequisite: Coursework in control systems or permission of instructor.

642. **Intelligent Systems**. Organization and characteristics of intelligent systems. Optimization. Evolutionary algorithms. Neural network and fuzzy logic algorithms. Intelligent control. Prerequisite: Permission of instructor.

643. **System Identification and Adaptive Control**. Modeling of systems using structure identification, parameter estimation, and model validation. Controller design based on input-output models. Parameter adaptive control. Prerequisite: Permission of instructor.

650. **Software Engineering**. Introduces classical software lifecycles and software development paradigms. Provides state of the art practical experience in proposal development and software design. Develops integrated skills drawing experience from computer engineering, computer science, communication, systems engineering, and problem solving. Prerequisite: Permission of instructor.

651. **Software Engineering Large Systems I.** Introduces advanced integrated software systems development paradigms. Notions of process and integrated system views. Modeling-in-the-large and modeling-in-the-small are discussed and related to levels in Object Oriented Design and programming. Prerequisite: Permission of instructor.

652. **Software Engineering Large Systems II**. Builds on the advanced integrated software systems development paradigms**.** Components are introduced as elements of large system implementations. In the context of a design taxonomy, advanced Object-Oriented design and development techniques are reviewed. Prerequisites: Permission of instructor.

657. **Enterprise Information Architecture Engineering.** Study and practice of the enterprise architecture engineering for developing multi-tiered enterprise level systems. Methodologies for design and implementation of large-scale information systems. Distributed computing, clients, servers, operating systems and databases. Prerequisite: Permission of instructor.

661. **Advanced Electrical Machinery I.** Synchronous machine theory. Prerequisites: Permission of instructor.

662. **Advanced Electrical Machinery II**. Induction machine theory. Prerequisite: Permission of instructor.

663. **Control of Synchronous Machines**. Methods for control of synchronous machines. Prerequisite: Permission of instructor.

671. **Computer Applications in Power Systems**. Analysis of power systems operation. Prerequisite: Permission of instructor.

672. **Power System Overvoltages**. Events causing overvoltages. System protection. Prerequisite: Permission of instructor.

673. **Reliability of Power Systems**. Component reliability using standard industrial techniques. Prerequisite: Permission of instructor.

674. **Economic Operation and Control of Power Systems**. Economic control of thermal generating stations and hydrothermal stations. Computer control of power systems. Prerequisite: Permission of instructor.

682. **Multivariable Systems**. Analysis and design of multiple-output, multiple-input control systems. Prerequisite: Permission of instructor.

*690. **Special Topics in (Area)**. Prerequisite: Permission of instructor. 1-12 hours.

*691. **Special Problems in (Area)**. Prerequisite: Permission of instructor. 1-12 hours.

*697. **Project.** Graduate project for Plan II Master's students. Prerequisite: Permission of instructor. 3 hours.

*698. **Nonthesis Research**. Does not count towards a degree. 1-12 hours.

*699. **Master's Thesis**. Master's thesis for Plan I Master's students. Prerequisite: Admission to candidacy. 1-12 hours.

Interdisciplinary Engineering (Ph.D)

Concentrations offered: Computational Engineering, Environmental Health & Safety Engineering

Faculty - Because of the interdisciplinary nature of this program, participating faculty come from various areas of engineering. A complete listing of all engineering faculty can be found at http://www.uab.edu/engineering/school-profile/fac-staff-dir.

Program Objectives

For more than a decade, research-focused centers at UAB and elsewhere have brought together expertise from many disciplines to solve problems. This same problem-solving approach is now finding its way into academic programs through the implementation of interdisciplinary graduate education. It is the premise of these interdisciplinary programs that students must be educated in more than one area to remain competitive and have successful careers whether they choose to stay in academia or work in industry. Industries are particularly interested in graduate education that emphasizes breadth of knowledge as well as depth in a particular field. Today's professional must be able to change, focus, and move between disciplines in order to keep up with rapid market shifts and technological advances.

The Ph.D. program in Interdisciplinary Engineering takes advantage of unique resources and strengths at UAB. This program fosters interdisciplinary interactions between the School of Engineering and medical and biomedical units and the Schools of Business and Public Health and the College of Arts and Sciences. Students in Interdisciplinary Engineering will have the opportunity to develop a plan of study and research topic which incorporates course work and faculty expertise from two or more of these disciplines.

The students enrolled in the Interdisciplinary Engineering Ph.D. program will gain the skills needed to succeed as independent and productive investigators in multidisciplinary analysis and design, with applications over a wide spectrum of science, engineering, health, and medical fields. The interdisciplinary program will:

- provide a rigorous academic curriculum including course work in two or more disciplines,
- provide collaborative interactions with students and faculty from a variety of disciplines,
- provide unique opportunities for interdisciplinary research, and
- facilitate continued development of high quality research programs supported by external funding.

Two tracks are available in the Interdisciplinary Engineering Ph.D. program – **Computational Engineering** and **Environmental Health & Safety Engineering**.

Admission Requirements

Students applying to the Interdisciplinary Engineering Ph.D. program have completed an undergraduate degree in a supporting field and must submit official transcripts and Graduate Record Exam (GRE) scores with their application. In general, GRE quantitative and verbal scores of at least 151 and 150, respectively, and a minimum undergraduate or master's degree grade point average of 3 on a 4 point scale are required for admission. Students for whom English is a second language should have a TOEFL (Test of English as a Foreign Language) score no less than 100 on the Internet Based TOEFL. The Interdisciplinary Engineering Admissions Committee reviews all applications completed and submitted and will make all admission decisions.

Degree Requirements

The Ph.D. in Interdisciplinary Engineering promotes a research-based curriculum. A minimum number of core courses will be required of all students in the program, with additional course work directed by the student's graduate research committee based on the student's area of interest. Committee members must be selected from at least two different disciplines, and the planned curriculum must result in cross-training in two or more disciplines.

Students entering the Ph.D. program with a baccalaureate degree must, in keeping with UAB Graduate School Policies, complete at least 48 hours of course work prior to admission to candidacy. Up to 16 credits of the 48 can be as non-dissertation research credits, and up to 10 credits can be as lab rotations, seminars or directed study credits. Students entering the Ph.D. program with a Master's degree in a related field, M.D., DMD, etc., must complete at least 27 credit hours of course work prior to candidacy. Up to 6 credits of the 27 can be non-dissertation research credits, and up to 6 credits can be as lab rotations, seminars, or directed study credits.

The UAB Graduate School also requires that students complete at least two semesters as a full time student in candidacy or accumulate at least 24 credits in research hours or course work in candidacy prior to granting of degree. At least 24 hours of dissertation research will be required for Ph.D. program graduates in Interdisciplinary Engineering.

All students in the IE program must complete the following core courses:

EGR 710 Introduction to Interdisciplinary Engineering (3 credit hours) - introduction to current trends and cutting-edge research in areas related to engineering that require interdisciplinary approaches

EGR 711 Methodology for Interdisciplinary Research (3 credit hours) – presentation of a more detailed perspective on methods of approach for interdisciplinary problems, including experimental design, laboratory experimentation, physical modeling, simulation and analysis.

EGR 796 Interdisciplinary Engineering Journal Club (1 credit hour; continuous enrollment) - Because students are engaged in research throughout several departments, this regular meeting is important to maintain cohesion within the group and to encourage exchange of ideas from a variety of perspectives.

A Comprehensive Exam is required of all doctoral candidates. The exam may include both written and oral components and will include presentation of the student's dissertation proposal. The exam will be administered by the student's graduate research committee. Upon successful completion of the

Qualifying Exam and completion of at least 48 hours of course work (in keeping with Graduate School requirements), a student is admitted into doctoral candidacy.

A dissertation showing the ability to conduct independent research and organizational and presentation skills must be prepared on a topic in the research field of interest. Dissertation results are expected to be submitted for refereed scholarly publication. The dissertation must comply with UAB dissertation preparation guidelines. When the dissertation has been completed, doctoral candidates will present and defend their work before their graduate research committee and the public. This defense will constitute the candidate's final exam. The results of the examination must be reported to the Graduate School at least six weeks before the commencement at which the degree is to be conferred.

Program Resources

High Performance Computing (HPC), High Fidelity Simulations (HFS), Tera/Penta-scale data mining/management/analysis, image processing, feature extraction, pattern recognition, and geometry reconstruction are the key enabling technologies in addressing 21st century science and engineering problems. These technologies are necessary for the development of cross-cutting toolkits to enhance research and development in interacting biological, chemical, medical, physical, business and finance, and engineering phenomena associated with interdisciplinary engineering research.

In response to this need, UAB has made a strategic investment in establishing an Enabling Technology Laboratory (ETLab). The ETLab provides software and hardware infrastructure and support for high-performance parallel and distributed computing, numerical tools, information technology-based computing environments, and computational simulation to UAB and Southern Research Institute (SRI) researchers. In collaboration with UAB interdisciplinary investigators, the ETLab has established 6.0+ Teraflops high performance computing clusters, including an IBM Blue gene with 2048 processors and a visualization infrastructure with stereoscopic and high resolution large displays. Both hardware and software essential for interdisciplinary engineering research can be fully supported by this equipment.

A 3D laser scanner necessary for full three-dimensional modeling and reconstruction was acquired by a collaborative team including faculty from the Schools of Engineering and Medicine. Access to this and other equipment, as well as clinical data available in the Radiology, Orthopedic, and Surgery departments and the School of Dentistry will be available to the students and interdisciplinary teams of faculty members participating in the interdisciplinary engineering program. These teams have already been collaborating on several sponsored and un-sponsored research programs in both computational engineering and environmental health and safety engineering tracks.

Additional equipment to facilitate engineering research is available to Interdisciplinary Engineering students through the laboratories of the Departments of Materials Science & Engineering, Mechanical Engineering, Electrical & Computer Engineering, Biomedical Engineering, and Civil, Construction, & Environmental Engineering. Additional equipment is available to students through participating faculty from other Schools across campus.

Program Curriculum

The Ph.D. in Interdisciplinary Engineering program encompasses a broad spectrum of possible fields of expertise in engineering and science, and as such, curriculums vary depending on the specific fields of research and background of the student.

Computational Engineering (CME) Track

The CME track of the Interdisciplinary Engineering program takes advantage of UAB's diversified Schools of Engineering, Public Health, Dentistry and Medicine and College of Arts and Sciences to produce Ph.D. candidates cross-trained in computational engineering from a variety of disciplines. The program provides students an in-depth foundation and innovation opportunities in interdisciplinary aspects of enabling technologies - geometry generation and computer-aided geometry design, mesh generation and adaptation, visualization, augmented reality and virtual reality, image processing and pattern recognition, design optimization, computational fluid dynamics, computational structural mechanics, high performance and parallel computing, and molecular dynamics applicable to disparate time and length-scale problems encountered in biomedical, biology, medicine and surgery, physics and biophysics, manufacturing, combustion, aeronautics and astronautics, and energy, environment and power.

Environmental Health and Safety Engineering (EHSE) Track

The EHSE track of the Interdisciplinary Engineering program takes advantage of UAB's diversified Schools of Engineering and Public Health, and College of Arts and Sciences as well as the nationally renowned health sciences center, to produce Ph.D. candidates cross-trained in public health, environmental, and safety engineering from a variety of disciplines. The program provides students with an understanding of basic mechanisms through which agents alter environmental, human, and ecosystem health, and the skills needed to evaluate and implement remediation for environmental problems, in the context of engineering and public health.

Coursework

In addition to EGR 710, EGR 711, and EGR 796, course selection is based on the research and career goals of the student, and curricula will vary between students. Students are guided by their faculty mentor

(committee chair) and a graduate study committee composed of faculty representing an interdisciplinary team in the student's area of research interest. The coursework must include courses from at least two disciplines.

This work will be completed under the guidance of the student's faculty mentor (graduate study committee chair). An approved 6 hour internship may be substituted for 6 of the required dissertation research hours. Non-dissertation Research and Dissertation Research hours will be taken through the department of the student's faculty mentor.

Additional Information:

Deadline for Entry Term(s):	Fall: July 1· Spring: November 1, Summer: April 1
Deadline for All Application Materials to be in the Graduate School Office:	Six weeks before term begins
Number of Evaluation Forms Required:	Three
Entrance Tests:	GRE General Test (TOEFL is also required for international applicants whose native language is not English.)

Contacts:

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Leonardo Art & Engineering Graduate Certificate

This information is not official and is offered strictly as a convenience. For official UAB Course Catalog information please visit the UAB Academic Programs and Policy site.

PROGRAM DESCRIPTION

Leonardo da Vinci is recognized as embodying the concept of the Renaissance Man as he was a painter, sculptor, architect, musician, scientist, mathematician, engineer, and inventor - an accomplished artist of the 16th century and a perfect example of interdisciplinary endeavors.

In this spirit of the *Renaissance Person*, the Departments of Mechanical Engineering and Art & Art History bring their collective expertise and experience together to offer a new interdisciplinary Category A certificate program involving an integrated art and engineering curriculum.

The *Leonardo* Art & Engineering program crosses traditional boundaries between academic disciplines and forges new collaborations to create a scholar/scientist/artist ready to meet the demands of the 21st century.

The objectives for the program are to:

- Provide cross-disciplinary training in simulation, art, visualization, and virtual reality to students with a BS/BA degree in Arts and Sciences, Engineering, Business, or Healthcare-related disciplines for addressing marketing, education/training, entertainment, product development, and design application demand of the 21st century growth area in 3D and VR technologies.
- Offer a mechanism for the large number of practicing artists, engineers, healthcare professionals, business managers, and game developers in Alabama and Birmingham to acquire additional training and education in simulation, 3D visualization, and VR.
- Provide a specialized education suitable to the needs of in-state, out-of-state, and international students interested in the application of 3D visualization, VR, and simulation to the industry or business segment of their preference. The program will provide the students with highly specialized and marketable skills.

PROGRAM REQUIREMENTS

- Students must be admitted to either Department in either the undergraduate or graduate program or to the UAB Graduate School as a non-degree seeking student. (Undergraduates may begin work on the certificate in their senior year provided they have satisfied prerequisite requirements and obtained

approval from the Graduate School to take graduate level courses. A certificate can only be awarded after completion of the BA or BS degree requirements.)

- Students must be admitted to the Leonardo Art & Engineering Certificate program using the degree-seeking application found on the UAB Graduate School website.
- Certificate requires a minimum of 18 semester hours.
- Relevant courses taken towards the certificate may be applied to the MS degree offered by the Department of Mechanical Engineering or MA degree offered by the Department of Art & Art History.
  - One course, up to three semester hours, may be transferred from another institution. This may be the required course or one of the graduate level courses.
  - Courses taken from UA and UAH by IITS may be applied to certificates.

COURSE REQUIREMENTS

Total of 18 credit hours, as follows:

* **ME 521** Introduction to Computational Fluid Dynamics or **ME 564** Introduction to Finite Element Method (3 credit hours)
* **ME 581** Visualization and Virtual Reality Fundamentals & Tools (3 credit hours)
* **ARS 520** Sculpture (3 credit hours)
* **ARS 561** 3D Computer Modeling (3 credit hours)
* **ME 698** Non-Thesis Research (3 credit hours)
* **ARS 588** Seminar in Time Based Media (3 credit hours)

CONTACTS

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Master of Engineering: Advanced Safety Engineering and Management (MEng-ASEM)

Note that this program is totally online.

Degree Offered:	MEng
Director:	Martha W. Bidez
Phone:	(205) 934-6528
E-mail:	mbidez@uab.edu
Web site:	http://www.uab.edu/asem

Instructors

The MEng-ASEM graduate program is taught by a team of practicing safety and health professionals with Dr. Martha Bidez serving as overall Course Master. Practitioner-Scholars facilitate online discussions on key topics of interest in their industry sector and provide industry-specific case studies. Students participate in peer to peer learning activities discussing current topics of interest and real world experiences using on line discussion boards.

Faculty

Martha Warren Bidez, PhD, Professor and Graduate Program Director; President & CEO, BioEchoes, Inc.

Jennifer M. Bailey, MSPH, CIH, CHMM, Adjunct Professor, Safety Manager, AMERICAN (American Cast Iron Pipe Company

Randy E. Cadieux, MS, MEng, Adjunct Professor; Marine Officer Control Officer-In-Charge, Marine Aviation Training Support Group-21

Judith Etterer, MSPH, Adjunct Professor; Staff Assistant, Mine Safety and Health Administration

Edward H. Kiessling, III, MSME, MSISE, MSEE, PE, Adjunct Professor; Manager, Safety, Waulity, and Management Services, Marshall Space Flight Center – NASA

Charles Herbert Shivers, PhD, PE, CSP, Professor and Associate Director, ASEM; Deputy Director Safety and Mission Assurance (retired), Marshall Space Flight Center - NASA

ASEM Admission Requirements

Admission to the UAB MEng-ASEM program requires the following:

- An undergraduate degree with a minimum 3.0 GPA from a regionally accredited school and a minimum of five years of professional work experience as evidenced by resume and recommendations.
    - Undergraduate degree does not have to be in engineering.
    - One of the recommendations must be a self-recommendation and one must be from a current, direct supervisor
    - Applicants not satisfying the grade point average requirement and/or holding a

To apply, go to **Apply Yourself** and complete and submit your online application. Please refer to the Advanced S
Acceptance

Additional Information

Application Submission Deadline for Entry Term(s):	Fall: July 1 Spring: November 1 Summer: April 1
Deadline for All Application Materials to be in the Graduate School Office:	Six weeks before term begins (see UAB academic calendar - https://www.uab.edu/students/academics/academic-calendar)
Number of Recommendations Required:	Three (including self-recommendation and recommendation from your current, direct supervisor)
Entrance Tests:	None
Comments:	The ASEM program is totally online. There are no on-campus classes, meetings, or activities. Course delivery includes asynchronous and synchronous learning modes.

For detailed program information, contact:

Martha Warren Bidez, PhD, Professor and Graduate Program Director
MEng in Advanced Safety Engineering and Management
UAB School of Engineering, HOEN 101
1720 2nd Avenue South, Birmingham, AL 35294-4440
Telephone: 205-934-6528
E-mail: mbidez@uab.edu

Web: http://www.uab.edu/asem

Course Descriptions

All courses are for 3 semester hours of credit.
The table below shows recommended course loading and sequence to complete within 24 months with no more than 6 credits per semester; however, it is possible to finish in 5 semesters if EGR 619 and EGR 620 are taken together. EGR 610 must be taken in the first semester.

Semester	Live Classroom Sunday 1:30-3:00 pm CDT	Live Classroom Sunday 3:00-4:30 pm CDT	Live Classroom Sunday 4:45 pm CDT
First	EGR 610	EGR 614	
Second	EGR 611	EGR 615	
Third	EGR 612	EGR 616	
Fourth	EGR 613	EGR 617	
Fifth		EGR 618	EGR 619
Sixth			EGR 620

Advanced Safety Engineering and Management – ASEM (EGR)

NOTE:

- Day and time of live classrooms are subject to change.
- Students are given some "free" live classroom misses and faculty will work individually with those who have an unavoidable work conflict to find a solution.

EGR 610 Introduction to System Safety – Prevention through Design. Best practice in any business sector requires the pursuit of a triple bottom line – protecting people, planet, and profit. This course provides an overview of system safety, in general, and Prevention through Design, in particular and explores their efficacy in helping companies achieve a bottom line that is socially, environmentally, and financially rewarding. Topics of inquiry include the processes of hazard analysis and risk assessment, the concept of "acceptable" risk, the safety decision hierarchy of controls, safety standards (the mandatory minimum vs. the voluntary best practice), safety as a cost control strategy, and the critical elements of a comprehensive, advanced safety program. Course content is presented within the framework of real-world case studies from a variety of industry sectors, including, but not limited to, manufacturing, utilities, and health care and includes several guest lectures by leaders in the profession. Students apply course content to their own business environment. Live participation in a weekly 1.5 hour online forum is required. The EGR 610 forum is typically held on Sunday from 1:30-3:00 CDT. EGR 610 must be taken during the first semester.

EGR 611 Hazard Analysis and Waste Elimination. Hazards have the potential to cause harm to people, planet, and profits. Hazard analysis is a process that begins with the identification of a hazard and proceeds into an estimate of the severity of harm or damage that could result if the potential is realized and a hazard-related incident occurs (ASSE TR-Z790.001 – 2009). This course examines engineering techniques utilized to systematically and logically identify and analyze hazards in the workplace. These techniques include preliminary hazard list (PHL), preliminary hazard analysis (PHA), system hazard analysis (SHA), subsystem hazard analysis (SSHA) and others. Students work in teams to use these techniques to retrospectively analyze a real-world disaster. Live participation in a weekly 1.5 hour online forum is required. The EGR 611 forum is typically held on Sunday from 1:30-3:00 CDT. Prerequisites: EGR 610 & EGR 614.

EGR 612 Engineering Risk: Assessment, Reduction, and Liability. Engineering risk is defined both quantitatively and qualitatively as an estimate of the probability that a hazard-related incident will occur and of the severity of harm or damage that could result. This course provides students with tools to assess and reduce safety risks in their own company. These tools include risk assessment matrices, probabilistic risk assessment (PRA) measures, including event tree analysis, fault tree analysis, and other prevention through design concepts. The role of a structured, formalized decision analysis process in preventing serious injuries and fatalities is also explored. Students engage in a risk mitigation decision analysis project, which is specific to their company and/or business sector. Guest lecturers from diverse

industries discuss their experiences in assessing and managing risk. Live participation in a weekly 1.5 hour online forum is required. The EGR 612 forum is typically held on Sunday from 1:30-3:00 CDT. Prerequisites: EGR 610, EGR 611 & EGR 614.

EGR 613 Human Performance and Engineering Design. Companies can miss important opportunities to eliminate waste if they rely primarily on training to prevent human error. This course explores the historical perspective on human error and serious injury. The course material will provide a solid understanding of the principles of occupational biomechanics and human tolerance to injury with focus on human anthropometry and mechanical work capacity. This course also includes studies of human reliability, static analysis of systems in equilibrium and mechanical systems' design and performance. Due to the quantity of back related injuries and related lost time in the workplace, back pain and injury is studied along with the effect of vibration on the human body. Real-world case studies provide for application of the engineering hierarchy of controls: hazard elimination, hazard substitution, engineering controls, warnings, administrative behavior controls, and personal protective equipment. The course also examines the design aspects of ergonomics, the biomechanical engineering basis of injury prevention, and the long term economic consequences of seemingly minor injuries. In semester projects, students perform incident investigations using biomechanical and other data. After gathering and analyzing data to determine injury causation, they will identify and re-design error-provocative environments in their own workplaces. Live participation in a weekly 1.5 hour online forum is required. The EGR 613 forum is typically held on Sunday from 1:30-3:00 CDT. Prerequisites: EGR 610 & EGR 614.

EGR 614 Cross Road: Engineering Ethics and Acceptable Risk. This course explores the economic, social, and political consequences of safety risk and considers provocative real world dilemmas: What is acceptable risk? Are the fundamental canons of engineering ethics contrary to the concept of acceptable risk? What is the worth of human life? Students will conduct critical reviews of corporate safety and ethics policies from market leaders in all major industries as well as their own company. Real-world case studies provide the framework for exercises in resolving conflicts of interest and avoiding the dilemma of "whistle blowing." Live participation in a weekly 1.5 hour online forum is required. The EGR 614 forum is typically held on Sunday from 3:00-4:30 CDT. Prerequisite: EGR 610 or concurrent enrollment.

EGR 615 Leading through Climates of Change. All progressive companies are moving toward greater sustainability – protecting people, planet, and profits. To guide their companies through these changes and integrate safety into the priorities at the executive level, safety engineers and professionals must have strong leadership skills. This course explores leadership best practices, including the eight steps of transformational leadership, change management strategies and the characteristics of High Reliability Organizations. The concept of "resilience engineering" is also explored.. Guest lecturers from diverse

industries discuss their experiences in managing change in today's global business environment. Live participation in a weekly 1.5 hour online forum is required. The EGR 615 forum is typically held on Sunday from 3:00-4:30 CDT. Prerequisites: EGR 610 & EGR 614.

EGR 616 Policy Issues in Prevention through Design. This course provides an overview of best practices in four major policy areas: (1) cost-benefit analysis; (2) corporate culture and the "HR Department"; (3) standards, codes, and regulations; and (4) strategic alliance development. Case studies are used to illuminate both the role of engineers and other safety professionals in shaping public policy on the local, national and international levels and the ethical challenges they encounter. The significance of an organization's corporate culture in developing and implementing advanced safety management plans is also explored. Students conduct "gap analyses" of their company's policies by comparing them to best practices and identifying unintended consequences of poor safety policy in their own business and industry sector. Students will engage in discussion board posts on contemporary policy issues and participate in exercises related to federal rulemaking. Live participation in a weekly 1.5 hour online forum is required. The EGR 616 forum is typically held on Sunday from 3:00-4:30 CDT. Prerequisites: EGR 610 & EGR 614.

EGR 617 Crisis Leadership and Safety-Critical Design. Unique technical and leadership skills are required to avert or manage a crisis. This course teaches students those skills in an experiential learning environment. Case studies of real-world industrial and environmental disasters provide the framework for exploring critical human-machine interfaces; crisis communication; coping with people in recovery and developing and implementing a business continuity response. Guest lecturers from diverse backgrounds will discuss their experiences in managing crisis events. Students will engage in discussion board posts and develop a Business Impact Analysis report for their work environment or business unit. Live participation in a weekly 1.5 hour online forum is required. The EGR 617 forum is typically held on Sunday from 3:00-4:30 CDT. Prerequisites: EGR 610 & EGR 614.

EGR 618 Intrapreneurship and Calculated Risk Taking. Intrapreneurs are innovative change agents inside an existing corporation -- insider entrepreneurs. This course prepares students to become and/or identify effective intrapreneurs within their own business environment. Topics include the history of intrapreneurial success inside technology-based corporations and the fundamentals of recognizing opportunity and launching a new, promising enterprise within an existing business. Students also learn to recognize and effectively manage intrapreneurial risk, including the safety readiness of technology for the market place and the corporate "immune response" to new ideas and inside innovators. Case studies of real-world intrapreneurial success and failure provide a framework for group discussion and student

exercises. Live participation in a weekly 1.5 hour online forum is required. The EGR 618 forum is typically held on Sunday from 3:00-4:30 CDT. Prerequisites: EGR 610 & EGR 614.

EGR 619 Capstone Project – Part 1: Development of an Advanced Safety Engineering and Management Plan. Bringing to bear the competencies acquired through the program, students develop a proposal, outline, schedule and rough draft of a comprehensive, advanced safety engineering and management plan for their business unit/specialty area that is consistent with the ANSI/AIHA Z10-2005, Occupational Health and Safety Management Systems standard. Judicious selection of the Capstone topic and of projects throughout the ASEM curriculum allows students to build on and use earlier course products to support their Capstone report. Live participation in a quarterly 1.25 hour online forum is required. The EGR 619 forum is typically held on Sunday at 4:45-6:00 CDT. Prerequisites: EGR 610, EGR 611, EGR 612, EGR 613, EGR 614, EGR 615, EGR 616 and EGR 617. EGR 619 must be taken during the penultimate or final semester.

EGR 620 Capstone Project – Part 2: Development of an Advanced Safety Engineering and Management Plan. Students complete the development of their comprehensive, advanced safety engineering and management (ASEM) plan that was begun in EGR 619, including background information of the project, an ASEM plan (management and employee participation, planning, implementation and operation, evaluation and corrective action and management review), and rollout strategy. Students must submit completed report with detailed attachments, and orally present project highlights to the class in a live online classroom setting. Live participation in a quarterly 1.25 hour online forum is required. The EGR 620 forum is typically held on Sunday at 4:45-6:00 CDT. Prerequisites: EGR 610, EGR 611, EGR 612, EGR 613, EGR 614, EGR 615, EGR 616 and EGR 617. EGR 620 must be taken during the final semester.

Master of Engineering: Information Engineering and Management (M.Eng.)

Degree Offered:	M.Eng.
Director:	Dr. Dale W. Callahan, PE
Phone:	(205) 934-8480
E-mail:	iem@uab.edu

Web site: **http://www.uab.edu/iem**

Faculty

Don Appleby, Instructor and Director of Strategic Planning. President, Incur Consulting **Dr. Dale W. Callahan**, PE, IEM Director and Associate Professor, UABElectrical and Computer Engineering.

Rusty Hyde, Instructor. Chief Engineer, Hyde Engineering

David G. Green, Instructional Associate Professor, UAB Electrical and Computer Engineering**Brian M. Rabon**, Instructor. President, The Braintrust Consulting Group

Jennifer Skjellum, Instructor. President, RunTime Computing Solutions, LLC

IEM Admission Requirements

Admission to UAB Information Engineering and Management requires

1. An undergraduate degree from a regionally accredited university.
2. Preference is given to engineering, math, science or technical-related undergraduate degrees.
3. Original transcripts from every institution attended should be requested by the applicant and sent directly to the UAB Graduate School.
4. Relevant industry work experience as evidenced by your resume and three recommendations.
5. An essay containing a short paragraph addressing each of the following questions:
    1. Why do you want to be a part of IEM and what do you expect to gain?
    2. Describe your area(s) of technical expertise.
    3. Tell us about one major accomplishment and one major setback you have faced in your career and how that impacted you.
    4. Why will your classmates be glad you are on their team?
6. A video introducing yourself to IEM. The video should be less than 5 minutes in length. Please tell us a little about yourself, what you've done and why you want to be admitted to IEM. The video should be posted to YouTube, marked private with a limited access URL and the link e-mailed to iem@uab.edu.
7. An interview with the IEM admissions committee may also be required.
8. No GMAT/GRE required for admission to IEM!

To apply:

Whether you are on campus or online, or some of both, here is what all entering clients need to do:

Go to ***Apply Yourself*** for the UAB Graduate School and fill out application.

- Use the area on the left and choose "**Application for Admission as a Degree-Seeking Student**".
- Under the link **Application Information** and the option **Program Applying to:** choose **Information Engineering and Management**.
- Under **Additional Information** you will be asked to upload a resume.

- Applications will be processed in rounds. We encourage applicants to complete their application early to make sure they are considered for admission as soon as possible. A complete application means that all materials (transcripts, essay, resume, etc.) have been received by the Graduate School and the video should be uploaded to YouTube. Applications must be complete by the following deadlines or the application will be delayed to the next evaluation round:

	Application Complete by:	**Notification of status by:**
Round 1	January 1	March 1
Round 2	March 1	May 1
Round 3	May 1	July 1
Round 4	July 1	July 31

- Due to limited openings, applications completed after July 1 may not be accepted for the current year. If space is unavailable, the application may be deferred to the next Fall Semester.
- Acceptance is determined by the IEM Admissions Committee.
- Scholarships may be available to those that complete their paperwork before May 1 – see the IEM website at for more information.

Applications Submitted after July 1

If you are applying after the graduate school deadline (July 1 for Fall), the system will only allow you to apply for the following year. Go ahead and apply, then email IEM.

Late applicants may apply as “non-degree seeking” and pay an additional application fee. If approved by the Graduate School deadline, they may start classes in the Fall semester. Applicants are still required to submit the paperwork shown above. The non-degree seeking deadline is typically two weeks before classes begin.

Additional Information

Deadline for Entry Term(s):	Fall: July 1
Deadline for All Application Materials to be in the Graduate School Office:	Approximately 3 weeks after deadline for entry
Number of Evaluation Forms Required:	Three
Entrance Tests:	N/A

For more information, contact IEM Director-Dr. Dale Callahan, PE or IEM Program Manager-Maria Whitmire, CAP-OM; IEM, Hoehn 370, 1530 3rd Avenue South, Birmingham, Alabama 35294-4440.

Telephone: 205-934-8480

E-mail: iem@uab.edu or mwhitmire@uab.edu

Web: www.uab.edu/iem

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit.

Information Engineering and Management – IEM (EGR)

FALL 1

EGR 640 Teambuilding. This course will focus on the effective building and management of teams. Topics include team communication, facilitation skills, building consensus, and handling common problems. (2 hours)

EGR 641 Professional Communications. This course focuses on recognizing, developing, and putting into practice effective communication skills. Lectures provide insights into presentation structure, style, and content. Self-evaluation exercises combined with personal coaching will help clients improve their professional speaking and presentation skills.

EGR 642 Entrepreneurship. This course is an introduction to entrepreneurship that begins with the development of personal insights and work habits that are fundamental to success within any organization.

SPRING 1

EGR 643 Information Management. This course focuses on the critical role of data analytics and quantitative methods in the area of information engineering. Operational and strategic challenges will be viewed from an engineering perspective. A core set of analytical tools will be presented and discussed. Topics will include decision analysis, optimization, modeling, simulation, and data analysis.

EGR 644 Business Processes. This course provides a broad understanding of business process modeling with a focus on how to recognize inefficient business processes and revamp them utilizing the latest technologies and management techniques.

SUMMER

EGR 645 Project Leadership. This course teaches the fundamental concepts of leading projects. The course will consider all aspects of project leadership including the use of standard methodologies. Best

practices will be reviewed along with practical insights based on real-world project leadership experience. Trends and directions will also be discussed.

EGR 646 Management of Technology. This course focuses on the application of systems engineering methods to the management of technological change within the organization. Topics include systems thinking, managing complexity, the systems engineering lifecycle, reliability and availability, quality control, and measuring effectiveness.

FALL 2

EGR 650 Leadership. This course will focus on the development of professional leadership skills. Topics include the nature of leadership, leadership styles, and the essential principles of effective leadership. (1 hour)

EGR 651 Technology Ventures. This course builds upon the topic of entrepreneurship with a focus on the process of developing and managing a successful venture. The objective is for clients to emerge with the knowledge and confidence needed to successfully manage, or start, a technology venture.

EGR 652 Financial Analysis. This course introduces financial concepts including the interpretation of financial statements, managing cash flow, time value of money, capital budgeting, and investment analysis.

SPRING 2

EGR 653 Strategy and Innovation. This course examines technological innovation as an element of organizational strategy. Topics include the nature and management of innovation, the product design and development process, and aligning technical groups with overall organizational strategy. Exercises will include the development of a new product rollout plan and the design of a strategic planning process.

EGR 655 IEM Design Project. This course is focused upon a final design project that incorporates the technical and entrepreneurial coursework taken previously. Projects will be assessed based on their technical design and financial justification.

Master of Engineering: Construction Engineering Management (M.Eng.)

Degree Offered: M.Eng.

Director: Wilbur Hitchcock

Phone: (205) 975-5848

E-mail: wah@uab.edu

Web site: http://www.uab.edu/engineering/professional-programs/cem

Faculty

Wilbur A. Hitchcock, Professor (Civil, Construction, and Environmental Engineering); Construction Engineering Management, Structural Engineering

Dianne Gilmer, Instructor

CEM Admission Requirements

Admission to the UAB CEM requires

1. Bachelors degree from an accredited U.S. College or University
2. Personal interview with program manager
3. Two letters of recommendation
4. NO GRE REQUIRED

To apply:

Go to ***Apply Yourself*** for the UAB Graduate School and fill out application.

- Should apply as **Graduate Application**.
- Please make sure you use an email and phone number where you can be contacted for an interview.
- Use the area on the left and choose "**Application for Admission as a Degree-Seeking Student**".
- Under the link **Application Information** and the option **Program Applying to:** choose **Information Engineering and Management**.
  Under **Additional Information** you will be asked to upload a resume.

Once your application is complete, a member of the committee will contact you for an interview.

Additional Information

Deadline for Entry Term(s):	Spring: November 1, Summer: March 31
Deadline for All Application Materials to be in the Graduate School Office:	Six weeks before term begins

Number of Evaluation Forms Required:	Two
Entrance Tests:	N/A

For detailed information, contact Dianne Gilmer, IEM, Hoehn 130B, 1530 3rd Avenue South, Birmingham, Alabama 35294-4440.

Telephone: 205-975-5848.

E-mail: digilmer@uab.edu

Web: http://www.uab.edu/engineering/professional-programs/cem

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit.

Construction Engineering Management (CE)

CE 669 Advanced Project Management. Skills generally required for sound project management in a variety of management settings are studied in addition to specific management issues typically associated with engineering and construction companies. A discussion of corporate organizational structures and the evolving use of project management processes helps establish an appreciation for the role of a Project Manager. The elements of a project and the role and responsibilities of the Project Manager are studied in depth. Students are also acquainted with risk management concepts, financial, labor, safety, equipment, contracting issues facing managers in the engineering and construction environment. Particular emphasis is placed on individual management strengths and weakness, team building, and characteristics of successful companies. One of the primary vehicles for discussion will be small case studies from real companies and the outside reading of one or two relevant topical books. 3 hours

CE 670 Construction Estimating and Bidding. Provides an overview of typical construction delivery systems and the planning and contracting associated with each. A broad study of estimating methodology ranging from rough ball park estimates to detailed unit pricing is presented focusing on labor, equipment, materials, subcontractors, job conditions, location, overhead and profit. This course is intended to establish a basic understanding of the estimating process, and therefore substantial course focus will be placed on the term group project which consists of the development of a bid estimate for a small construction project. 3 hours

CE 671 Construction Liability and Contracts. Provides an overview of the fundamental aspects of the laws that affect construction and engineering companies as well as the project owners. Particular emphasis is placed on contract forms and provisions related to liability for engineering design and construction companies, the roles of the typical participation in the process, and dispute resolution. (Prerequisites: CE 669 and CE 670 or approval by the Program Director). 3 hours

CE 672 Construction Methods and Equipment. Provides students a big-picture understanding of the construction methods employed to bring the concepts and designs of architects and engineers to physical reality. The focus areas include earthmoving, heavy construction, building construction, and process plants. Students will understand the planning and deployment of equipment, materials, labor, and subcontractors required in the construction process. The course is strengthened with guest lectures from industry practitioners and student interaction with construction industry participants as parts of the group semester project. (Prerequisites: CE 669 or approval by the Program Director). 3 hours

CE 673 Techniques of Project Planning and Control. Provides a thorough understanding of the project scheduling process in construction planning and control. Students learn the relationship between the work breakdown structure, organization breakdown structure and the activities used in developing project schedules. The Critical Path Method (CPM) and the Precedence Diagram Method (PDM) are discussed in detail to include hand calculations and powerful computer software products. The use of scheduling techniques for project control, resources constraint management, cash flow management and project completion date management are investigated and the importance of communications in the planning and controlling process emphasized. (Prerequisites: CE 669 and CE 670). 3 hours

CE 674 Overview of Green Building Design and Construction (LEED). This course provides an introduction to the emerging trends in green building sustainable design and construction. The course will include instruction suitable to prepare students for the Leadership in Energy and Environmental (LEED©) Green Building Rating SystemTM certification exam. (Prerequisite: CE 672). 3 hours

CE 675 Fundamentals of Financial & Managerial Accounting for Non-Financial Managers. Provides an extensive overview of accounting concepts for non-financial managers. Students will learn the basic elements of accounting (Generally Accepted Accounting Practices). They will understand typical financial records and financial statements are established for companies. Once the basics are understood,

students will study how financial data is used for internal cost controlling, planning, and budgeting. (Prerequisite: CE 669, CE 670, CE673, CE 677). 3 hours.

CE 676 Construction Project Risk Management. This course addresses the methodologies employed in the engineering and construction industries to assist in rational decision making in the face of uncertainty. The course reviews the fundamentals of common probabilistic theories and models, data sampling, hypothesis testing and the basics of Bayesian Decision Theory. In addition, basic financial analysis tools will be reviewed. Theoretical models will then be applied to specific examples encountered in engineering and construction decision making with emphasis on engineering economics applications. (Prerequisites: CE 669, CE 670, CE 673). 3 hours.

CE 677 Construction Accounting and Finance. Introduces students to some of the particular accounting needs, practices and methods unique to construction companies. Students will understand the details of budget preparation, cost tracking and reporting systems. Emphasis is placed on understanding the importance of linking detailed project planning, scheduling with cost accounting and reporting in the management of individual construction projects and the company as a whole. A broad overview of financial management of construction companies and the specific tools used to operate the enterprise are discussed. Business planning, financing and contracting strategies suitable for a cyclical demand industry are discussed. (Prerequisites: CE 669, 670, 672). 3 hours.

CE 679 Construction Methods – Detailing and Finishing. This course is an extension of the concepts and technical terminology introduced in Construction Methods and Equipment. Topics explored in this course include green design/sustainable construction, finishing systems, windows and cladding, HVAC/plumbing, and roofing. The International Building code will be examined, as well as fundamental engineering, design, and construction methods. Upon completion students will be better equipped to read and understand drawings and specifications, necessary skills for detailed estimating of cost and time. (Prerequisite CE 672) 3 hours

CE 680 Construction Management Capstone Case Study. (Prerequisites: CE 669, CE 670) (3 hours) Students review case studies in three areas:

- Part 1: Students review case studies involving project planning and risk assessment or individual topical study.
- Part 2: Students review case studies emphasizing project control and coordination or individual topical

study.
- Part 3: Students review case studies emphasizing technology advancements in construction methods and project management, or individual topical study.

Also set up as three – 1 hour courses:

CE 628 Construction Management Capstone Case Studies, Part 1 (1 hour)
CE 629 Construction Management Capstone Case Studies, Part 2 (1 hour)
CE 630 Construction Management Capstone Case Studies, Part 3 (1 hour)

CE 684 Construction Project Administration. This course is designed to provide a comprehensive overview of the important business, legal, and management aspects of construction management with emphasis on administrative procedures. The course is an extension of Advanced Project Management concepts with specific focus on the construction management issues facing owners, engineers, constructors, architects, and students. International business topics will also be discussed. (Prerequisite: CE 669 Advanced Project Management) 3 hours

CE 688 Strategic Management and Leadership Applications in a Global Environment. This course is designed to prepare students to face the demanding management and leadership challenges facing industry leaders as competition becomes ever more globalized. Strategic planning, management and leadership in the built environment requires savvy leaders with exceptionally developed analytical and communications skills suitable for multi-disciplinary and multi-national ventures. Organization design and management, selection and use of technology, and methodologies for measuring and monitoring performance are all fundamental working concepts necessary to think strategically in a changing world business environment. This course will provide the opportunity for students to discuss and research these concepts and to recognize the necessity to think independently, challenge conventional thinking, and visualize alternatives. (Prerequisite: CE 670 Estimating and Bidding) 3 hours

CE 689 Building Information Modeling (BIM) Techniques. This course provides students with an overview of the evolution of BIM technology in the construction industry followed by hands-on training in the basic application of contemporary BIM software. Students will learn basic modeling skills and how to produce graphical presentations. Advanced applications of BIM technology will be discussed and demonstrated. (Prerequisite: CE 670 Estimating and Bidding) 3 hours

Materials Engineering (Ph.D., M.S.Mt.E.)

Degree Offered:	Ph.D., M.S.Mt.E.
Director:	Dr. Uday Vaidya
Phone:	(205) 934-9199
E-mail:	**uvaidya@uab.edu**
Web site:	**www.eng.uab.edu**

Faculty

J. Barry Andrews, Professor and Chair (Materials Science and Engineering); Polymer and Metal Matrix Composites, Solidification, Physical Metallurgy, and Electronic Properties

Krishan K. Chawla, Professor Emeritus (Materials Science and Engineering); Metal-, Ceramic-, and Polymer- Matrix Composite Materials; Fibers; Interfacial Phenomena; Foams, and Microballoons

Derrick R. Dean, Associate Professor and Undergraduate Program Director (Materials Science and Engineering); Structure-Property Relationships of Polymers and Multiphase Polymer Systems, including Blends, Nano- and Micro-Composites

Zoe E. B. Dwyer Associate Professor, Director of Outreach and Retention (Materials Science and Engineering)

Robin D. Foley, Associate Professor (Materials Science and Engineering); Materials Characterization, Physical Metallurgy, and Metals Casting

Amber L. Genau, Assistant Professor (Materials Science and Engineering); Solidification, Physical Metallurgy, Microstructure Characterization, and 3D Image Reconstruction and Analysis

Gregg M. Janowski, Professor (Materials Science and Engineering); Interim Faculty Director of Academic Assessment, Office of the Vice Provost for Student and Faculty Success; X-Ray Diffraction, Composite Materials, Physical Metallurgy, and Structure-Processing-Property Relationships

Charles A. Monroe, Assistant Professor (Materials Science and Engineering); Solidification, Metals Casting, Design for Manufacture, Simulation and Modeling

Haibin Ning, Research Assistant Professor (Materials Science and Engineering); Polymer Matrix

Composite Materials, Metal; Design and Modeling, Manufacturing and Processing, Testing and Characterization

Selvum "Brian" Pillay, Associate Professor (Materials Science and Engineering); Polymer Matrix Composites, Multiscale, Multiphase Composite Systems; Manufacturing and Processing, Design for Manufacture, Testing and Characterization

Rosalia N. Scripa, Professor (Materials Science and Engineering); Ceramics and Glass, Extractive Metallurgy, Semiconductor Crystal Growth, and Electronic-Magnetic Materials

Uday Vaidya, Professor and Graduate Program Director (Materials Science and Engineering); Polymer Matrix Composites, Processes & Process Modeling, Nondestructive Evaluation and Dynamic Response

Admission Requirements

In addition to the general Graduate School admission requirements, requirements for admission to the M.S.Mt.E. and Ph.D. graduate programs include the following criteria:

1. A 3.0 (A = 4.0) or better GPA on all undergraduate degree major courses attempted
2. MSE evaluates the three scores reported on the GRE revised General Test (as of August 2012):
    - a Verbal Reasoning score reported on a 130-170 score scale, in 1-point increments
    - a Quantitative Reasoning score reported on a 130-170 score scale, in 1-point increments
    - an Analytical Writing score reported on a 0-6 score scale, in half-point increments
    - MSE recommends that a student receive a minimum quantitative score of 148/170 (600/800 on the old scale); a verbal score of 153/180 (500/800 on the old scale) and a score of 3/6 on the analytical writing
3. TOEFL is an additional requirement for international students. The revised TOEFL scoring scale for an internet based TOEFL test (iBT) is 0-120 which includes:
    - Reading Section (Score of 0-30)
    - Listening Section (Score of 0-30)
    - Speaking Section (Score of 0-30)
    - Writing Section (Score of 0-30)

MSE requires a minimum TOEFL score of 80-120 (20 in each section) to be considered for admission and financial support. For applicants who report TOEFL scores based on a paper test or a computer test, the

scores will be compared to the iBT scale.

Preparatory Courses

A student seeking a graduate degree in Materials Engineering without a Baccalaureate degree in Materials Engineering or similarly named program accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org, must demonstrate competence at the undergraduate level in the areas of physical behavior of materials, thermodynamics, mechanical behavior of materials, instrumentation, and characterization. He/she may do this by passing all or some of the following courses depending on the student's academic background. Students may be exempted from individual courses if they demonstrate that they possess the knowledge from that course. However, the burden of proof is on the student. The decisions are based on a balance between assuring a sufficient background and imposing more extensive course demands. The preparatory courses must be taken on a pass/fail basis, with a "pass" being equivalent to a grade of B or better in the course. The courses that fulfill the preparatory requirements are:

MSE 280-Engineering Materials
MSE 281-Physical Materials I

MSE 380-Thermodynamics of Materials (Not required if graduate students takes MSE 603/703)
MSE 381-Physical Materials II
MSE 382-Mechanical Behavior of Materials.
MSE 565-Characterization of Materials

M.S.Mt.E. Program

The following minimum requirements for a Master of Science in Materials Engineering apply to a student who has earned a baccalaureate degree from a program accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org, in materials or metallurgical engineering or in a similarly named engineering program. A student with an undergraduate degree in another field of engineering or in the physical sciences may also be accepted into the Materials Engineering program. However, such a student will be required to demonstrate competence in fields of study that emphasize the interrelationship among structure, processing, performance, and properties of materials. This can be accomplished by one of the methods described under "Preparatory Courses." All full-time master's students must take MSE 601-Materials Science and Engineering Seminar every term.

Plan I (Thesis Option)

The student must successfully complete at least 24 semester hours of (primarily) materials engineering graduate course work.

- Of these 24 hours, 3 to 6 semester hours will be approved courses in mathematics, physical sciences, another engineering discipline or management (a maximum of 3 hours are allowed in management).
- Up to 9 of the 24 hours may be at the 500 level.
- The student must successfully complete and defend a thesis.
- The student must register for and successfully complete at least 9 semester hours of MSE 699-Master's Degree Thesis Research in addition to the 24 semester hours of course work.

Plan II (Nonthesis Option): Research/Design Emphasis

The student must successfully complete at least 30 semester hours of (primarily) materials engineering graduate course work.

- Of these 30 hours, 3 to 6 semester hours will be approved courses in mathematics, physical sciences, another engineering discipline or management (a maximum of 3 hours are allowed in management).
- Up to 9 of the 30 hours may be at the 500 level
- The student must complete 3 semester hours of MSE 699-Nonthesis Research, involving an on-site research project (usually taken after completion of all coursework) and
- Successfully complete a written comprehensive examination on all course work taken in the program or a comprehensive examination on the on-site research project topic. The latter option requires a publication-quality manuscript and oral presentation (with questions) deemed acceptable by the graduate committee.

Plan II (Nonthesis Option): Technology/Engineering Management Emphasis

The student must successfully complete at least 30 semester hours of graduate credit, including 12 semester hours of course work in a specific area of materials science and engineering (at least 6 of these 12 hours must be at the 600 level);

- 6 semester hours of approved management course work
- 9 semester hours of engineering-oriented management coursework and
- 3 hours of MBA 631-Administrative Theory and Practice.
- The student must also complete 3 semester hours of MSE 698-Nonthesis Research involving an on-site design or research project (usually undertaken after completion of all course work) Successfully complete a written comprehensive examination on all course work taken in the program or a comprehensive examination on the on-site research project topic. The latter option requires a publication-quality manuscript and oral presentation (with questions) deemed acceptable by the graduate committee.

Ph.D. Program

The Ph.D. program in Materials Engineering is offered jointly with the Department of Metallurgical and Materials Engineering at the University of Alabama (Tuscaloosa). All full-time doctoral students must take MSE 701-Materials Science and Engineering Seminar every term.

PhD Track (For students entering with a BS):

The following minimum requirements for a PhD in materials engineering apply to a student who has earned a baccalaureate degree from a program accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org, in materials or metallurgical engineering or in a similarly named engineering program. A student with an undergraduate degree in another field of engineering or in the physical sciences may also be accepted into the Materials Engineering program. However, such a student will be required to demonstrate competence in fields of study that emphasize the interrelationship among structure, processing, performance, and properties of materials. This can be accomplished by one of the methods described under "Preparatory Courses."

The requirements for a Ph.D. for a student entering with a BS degree are:

- A minimum of 48 hours of approved graduate course work in metallurgical engineering, materials engineering, or fields supportive of these (15 hours may be at the 500 level and at least 6 semester hours but no more than 12 must be in supportive fields (a maximum of 6 hours can be in management)). Additional course work may be required at the discretion of the mentor and program director.
- Successful completion of a written qualifying examination covering the preparatory course sequence. (Students will receive a Plan II Master's upon successful completion of the Qualifying Exam and 30 hours of coursework.)
- Successful completion of a Dissertation Research Proposal and examination on topics related to the student's research. (Completion of this step is required for Admission to Candidacy.)
- A minimum of 24 semester hours in MSE 799-Dissertation Research.
- Successful defense of a research dissertation in metallurgical/materials engineering.

PhD Track (For students entering with a MS):

This track is for students entering the program with a master's degree in Materials Engineering or a closely related field. The requirements are:

- A minimum of 24 hours of approved graduate course work in metallurgical engineering, materials engineering, or fields supportive of these (6 hours may be at the 500 level and at least 3 semester hours but no more than 6 must be in supportive fields (a maximum of 3 hours can be in

management)). Additional course work may be required at the discretion of the mentor and program director.

- Successful completion of a written qualifying examination covering the preparatory course sequence.
- Successful completion of a Dissertation Research Proposal and examination on topics related to the student's research. (Completion of this step is required for Admission to Candidacy.)
- A minimum of 24 semester hours in MSE 799-Dissertation Research.
- Successful defense of a research dissertation in metallurgical/materials engineering.

Additional Information

Deadline for Entry Term(s):	Each semester and summer
Deadline for All Application Materials to be in the Graduate School Office:	*Fall semester-March 1st Spring semester-November 1st
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)
Comments	*To be considered for funding

For detailed information, contact Dr. Uday Vaidya, Graduate Program Director, The University of Alabama at Birmingham, Department of Materials Science and Engineering, BEC 254, 1720 2nd Avenue South, Birmingham, AL 35294-0113.

Telephone 205-934-9199

Web **www.eng.uab.edu**

Course Descriptions

For doctoral courses at the University of Alabama (Tuscaloosa), see the graduate catalog of that

university. Unless otherwise noted, all courses are for 3 semester hours of credit.

Materials Science and Engineering (MSE)

501. Materials Processing. Processing of metals, glasses, ceramics, and composites. Powder processing, casting, welding, rapid solidification, and other advanced methods. 3 hours.

502. Frontiers of Materials. Recent advances in materials technology and application. Novel processing, structures, properties, and performance issues. 3 hours.

503. Degradation of Materials. Issues in long-term utilization of materials. Corrosion, high temperature oxidation, creep, fatigue, and their interactions. 3 hours.

505. Frontiers of Automotive Materials. Advanced lightweight automotive materials, manufacturing and modeling techniques. Technology advancements in cost-effective carbon, glass and related reinforcements; 'green' and sustainable materials, crashworthiness and injury protection of occupants and pedestrians, metal castings, heavy truck, mass transit, fuel cell and hybrid vehicles. Students taking this class will receive a GATE certificate of training in automotive materials technologies upon successful completion. 3 hours.

507. Interpretation of Microstructure. Interpretation of metal and ceramic microstructures with respect to their general type and origin and their relationship to their composition, type of phase diagram, processing, and the driving forces and kinetics of their evolution. The student will learn to identify the prior processing of a material and design means for modification to produce alternate structures. 3 hours.

508. Nanomaterials. The emphasis of this course will be to introduce the basic tools of nanotechnology, building blocks of nanostructured materials, the behavior of materials with nanoscale structures and their technological applications, including automotive, medical, and electronic, etc. 3 hours.

509. Principles of Metal Casting. Production and evaluation of cast ferrous metals (gray iron, ductile iron, steel) and non-ferrous metals (brass, bronze, aluminum). Design of castings and molds. Laboratory on the gating, risering and molten metal treatment, analysis and handling techniques required to produce high quality castings. 3 hours.

513. Composite Materials. Processing, structure, and properties of metal-, ceramic-, and polymer-matrix composite materials. Roles of interfacial bond strength, reinforcement type and orientation, and matrix selection in physical and mechanical properties of composite materials. 3 hours.

530. Polymeric Materials. (Also CH 580.) Processing methods, structure-engineering-property

relationships, and applications of polymeric materials. 3 hours.

533. Nondestructive Evaluation of Materials. Principles, applications and limitation of ultrasonic, vibration, acoustic emission, radiographic, magnetic particle, eddy current and other nondestructive testing methods. Intelligent sensors and health monitoring of real structures. 3 hours.

564. Metals and Alloys. Microstructures, properties, heat treatment, and processing of ferrous and nonferrous materials. 3 hours.

565. Characterization of Materials. Theory and practice of materials characterization, with emphasis on optical metallography, quantitative metallography, scanning electron microscopy, crystallography, and x-ray diffraction. Specific application in metals and ceramics considered. 4 hours.

570. Ceramic Materials. Structure, processing, properties, and uses of ceramic compounds and glasses. Mechanical, thermal, and electrical behavior of ceramic materials in terms of microstructure and processing variables. 3 hours.

584. Electronic, Magnetic and Thermal Properties of Materials. Mechanisms behind rectifying junctions, transistors, paramagnetism, diamagnetism, and ferromagnetism. 3 hours.

601. Materials Science and Engineering Seminar. Required of all full-time M. S. students. 1 hour.

603. Thermodynamics of Materials. Atomistic and classical approaches to the understanding of the thermodynamics of solids, phase transformations, chemical reactions, and alloy systems. 3 hours.

613. Mechanical Behavior of Materials. Microstructural effects on the deformation mechanisms responsible for mechanical behavior of engineering materials. 3 hours.

614. Process Quality Engineering. Application of the concepts and tools of total quality to develop, implement, and maintain an effective quality assurance system in a materials processing and manufacturing environment. Students will be exposed to probability models, statistical tools, linear and multiple regression, DOE, TQM and six sigma. 3 hours.

615. Nucleation and Growth. Nucleation, growth, and phase transformations in materials. The roles of heterogeneities, boundaries, temperature, and free energy are addressed. 3 hours.

616. Microstructural Processes. Theory and application of the principal microstructural processes in materials, including recrystallization, grain growth, coarsening, and sintering. 3 hours.

623. Solidification. Plane-front, cellular, and dendritic growth of single and polyphase alloys as applied to normal and directional solidification. Influence of epitaxy and convection on solidification structures. 3 hours.

630. Soft Materials: Synthesis, Characterization and Applications. This course deals with the synthesis and characterization of high molecular weight polymers using a range of polymerization reactions. Polymerization techniques will include addition, condensation and copolymerization. The associated kinetic and mechanistic studies will be presented. Characterization of solution properties, molecular weight and molecular structure will also be covered. 3 hours.

631. Polymer Structures/Morphology. Application of x-ray and electron diffraction, light electron and atomic force microscopy to crystal structure and morphology of polymers. Morphology-processing-property relationships, deformation mechanisms and orientation characterization. 3 hours.

632. Polymer Processing. Introduction to polymer processing. Design and analysis of plastic products and processes based on knowledge of the composition and physical and rheological behavior of the polymers. Product properties will be correlated with processing-induced morphology. 3 hours.

633. Advanced Mechanics of Deformation. Basics and intermediate mechanics of deflection of beams and columns, mechanics of impact, failure theories, plastic deformation of materials, fracture mechanics, fatigue, creep and vibration. The topic will be supported by industry relevant case studies. Suggested prerequisites: CE 220 Mechanics of Solid and MSE 382 Mechanical Behavior. 3 hours.

634. Design and Manufacture Technologies for Automotive Applications. Basics of lightweight materials, avenues on automotive component designs, emerging processing technologies in lost foam casting, thermoplastic composites and testing methodologies. 3 hours.

635. Advanced Mechanics of Composites. Classical lamination theory, analysis and failure of reinforced composite material systems, anisotropic elasticity, stress analysis and design of laminated composites including 3D effects, stress concentrations, free-edge effects, hygrothermal behavior, adhesive and mechanical connections. 3 hours.

636. Engineering Fibers. Processing-microstructure-properties of different fibrous materials: natural polymeric fibers (jute, sisal, silk, etc.), synthetic polymeric fibers (aramid and polyethylene, etc.), metallic fibers, and high performance ceramic fibers (alumina and silicon carbide). Application of Weibull statistics to strength of fibrous materials, techniques of mechanical testing of fibers and applications of fibers in various fields. 3 hours.

637. Quantitative Microscopy. Quantitative description of microstructural features. Relationships between microstructural characteristics and properties. 3 hours.

643. Scanning Electron Microscopy. Characterization of materials using scanning electron microscopy. Microscope construction and operation, interaction of electrons and signal production, imaging, and x-ray spectroscopy are addressed. Lecture and laboratory. 3 hours.

644. Crystallography and X-Ray Diffraction. Characterization of materials using diffraction. Crystallographic descriptions and databases, diffraction theory, X-ray diffractometer construction and operation, and experimental techniques are addressed. Comparisons of diffraction techniques are made. Lecture and laboratory. 3 hours.

653. Phase Diagrams. Analysis and interpretation of binary, ternary, and more complex phase diagrams including thermodynamic basis and construction. 3 hours.

667. Process Modeling and Simulation. Theory and practice of analytical methods and computational modeling for manufacturing processes of metals, ceramics, polymers and composites. Applications on processes such as metal cutting, welding, casting, massive forming, solidification, rapid prototyping, injection molding, and resin transfer molding. 3 hours.

668. Applied Finite Element Analysis. Finite Element Anaylsis (FEA) is widely used to design optimization and failure prediction in automobile, energy, aerospace and other industries. This course primarily looks at how to practically set up static structural models and get meaningful results. The focus will be on applying loading and boundary conditions, good meshes, convergence of results, and correct interpretation of results. Students will learn how to set up models using programs such as Pro/Engineer and ANSYS. 3 hours.

690. Special Topics in (Area). Prerequisite: Permission of graduate study committee. 1-6 hours.

691. Individual Study in (Area). Prerequisite: Permission of graduate study committee. 1-6 hours.

698. Nonthesis Research. Prerequisite: Permission of mentor. 1-12 hours.

699. Thesis Research. Prerequisite: Admission to candidacy and permission of mentor. 1-12 hours.

701. Materials Science and Engineering Seminar. Required of all full-time Ph.D. students. 1 hour.

703. Thermodynamics of Materials. Atomistic and classical approaches to the understanding of the

thermodynamics of solids, phase transformations, chemical reactions, and alloy systems. 3 hours.

713. Mechanical Behavior of Materials. Microstructural effects on the deformation mechanisms responsible for mechanical behavior of engineering materials. 3 hours.

714. Process Quality Engineering. Application of the concepts and tools of total quality to develop, implement, and maintain an effective quality assurance system in a materials processing and manufacturing environment. Students will be exposed to probability models, statistical tools, linear and multiple regression, DOE, TQM and six sigma. 3 hours.

715. Nucleation and Growth. Nucleation, growth and phase transformations in materials. The roles of heterogeneities, boundaries, temperature, and free energy are addressed. 3 hours.

716. Microstructural Processes. Theory and application of the principal microstructural processes in materials, including recrystallization, grain growth, coarsening, and sintering. Prerequisite: MSE 615 or 715. 3 hours.

723. Solidification. Plane-front, cellular, and dendritic growth of single and polyphase alloys as applied to normal and directional solidification. Influence of epitaxy and convection on solidification structures. 3 hours.

730. Soft Materials: Synthesis, Characterization and Applications. This course deals with the synthesis and characterization of high molecular weight polymers using a range of polymerization reactions. Polymerization techniques will include addition, condensation and copolymerization. The associated kinetic and mechanistic studies will be presented. Characterization of solution properties, molecular weight and molecular structure will also be covered. 3 hours.

731. Polymer Structures/Morphology. Application of x-ray and electron diffraction, light, electron and atomic force microscopy to crystal structure and morphology of polymers. Morphology-processing-property relationships, deformation mechanisms and orientation characterization. 3 hours.

732. Polymer Processing. Introduction to polymer processing. Design and analysis of plastic products and processes based on knowledge of the composition and physical and rheological behavior of the polymers. Product properties will be correlated with processing-induced morphology. 3 hours.

733. Advanced Mechanics of Deformation. Basics and intermediate mechanics of deflection of beams and columns, mechanics of impact, failure theories, plastic deformation of materials, fracture mechanics, fatigue, creep and vibration. The topic will be supported by industry relevant case studies. Suggested

prerequisites: CE 220 Mechanics of Solid and MSE 382 Mechanical Behavior. 3 hours.

734. Design and Manufacture Technologies for Automotive Applications. Basics of lightweight materials, avenues on automotive component designs, emerging processing technologies in lost foam casting, thermoplastic composites and testing methodologies. 3 hours.

735. Advanced Mechanics of Composites. Classical lamination theory, analysis and failure of reinforced composite material systems, anistropic elasticity, stress analysis and design of laminated composites including 3D effects, stress concentrations, free-edge effects, hygrothermal behavior, adhesive and mechanical connections. 3 hours.

736. Engineering Fibers. Processing-microstructure-properties of different fibrous materials: natural polymeric fibers (jute, sisal, silk, etc.), synthetic polymeric fibers (aramid and polyethylene, etc.), metallic fibers, and high performance ceramic fibers (alumina and silicon carbide). Application of Weibull statistics to strength of fibrous materials, techniques of mechanical testing of fibers and applications of fibers in various fields. 3 hours.

737. Quantitative Microscopy. Quantitative description of microstructural features. Relationships between microstructural characteristics and properties. 3 hours.

743. Scanning Electron Microscopy. Characterization of materials using scanning electron microscopy. Microscope construction and operation, interaction of electrons and signal production, imaging, and x-ray spectroscopy are addressed. Lecture and laboratory. 3 hours.

744. Crystallography and X-Ray Diffraction. Characterization of materials using diffraction. Crystallographic descriptions and databases, diffraction theory, X-ray diffractometer construction and operation, and experimental techniques are addressed. Comparisons of diffraction techniques are made. Lecture and laboratory. Prerequisite: MSE 643 or 743. 3 hours.

753. Phase Diagrams. Analysis and interpretation of binary, ternary, and more complex phase diagrams including thermodynamic basis and construction. 3 hours.

767. Process Modeling and Simulation. Theory and practice of analytical methods and computational modeling for manufacturing processes of metals, ceramics, polymers and composites. Applications on processes such as metal cutting, welding, casting, massive forming, solidification, rapid prototyping, injection molding, and resin transfer molding. 3 hours.

768. Applied Finite Element Analysis. Finite Element Analysis (FEA) is widely used to design

optimization and failure prediction in automobile, energy, aerospace and other industries. This course primarily looks at how to practically set up static structural models and get meaningful results. The focus will be on applying loading and boundary conditions, good meshes, convergence of results, and correct interpretation of results. Students will learn how to set up models using programs such as Pro/Engineer and ANSYS.

790. Special Topics in (Area). Prerequisite: Permission of graduate study committee. 1-6 hours.

791. Individual Study in (Area). Prerequisite: Permission of graduate study committee. 1-6 hours.

798. Nondissertation Research. Prerequisite: Permission of mentor. 1-12 hours.

799. Dissertation Research. Prerequisite: Admission to candidacy and permission of mentor. 1-12 hours.

Graduate Automotive Technology Education (GATE)

The Graduate Automotive Technology Education (GATE) program is a Department of Energy funded initiative at UAB for advancing the state of the art in lightweight materials and manufacturing technologies for automotive, mass transit and truck. There is increasing emphasis on reducing weight in vehicles as a means to meet stringent Corporate Average Fuel Economy (CAFÉ) standards. The GATE program recruits graduate students from materials, mechanical, biomedical, civil and interdisciplinary engineering with a GPA of 3.5 or above. The GATE scholars work towards their research on GATE topics and enroll in GATE courses.. A GATE certificate of completion is issued by the MSE department upon successful completion of GATE courses. Please visit www.uab.edu/composites for additional information and the application process for the GATE program.

Mechanical Engineering (M.S.M.E.)

Degree Offered: M.S.M.E.

Director: Bharat Soni

Phone: (205) 934-8460

E-mail: bsoni@uab.edu

Web site: http://www.uab.edu/engineering/departments-research/me/graduate

Faculty

Gary Cheng, Associate Professor (Mechanical Engineering); Computational Fluid Dynamics, Multi-phase Combustion

Alan Eberhardt, Professor, (Biomedical Engineering); Solid Mechanics, Analytical and Numerical Methods in Biomechanics

Jong-Eun Kim, Research Associate Professor (Mechanical Engineering): Computational Structural Mechanics, Fluid-Structure Interactions, Multidisciplinary Optimization

Roy P. Koomullil, Associate Professor (Mechanical Engineering); Computational Fluid Dynamics, Unsteady Flows, Generalized Overset Meshes

David L. Littlefield, Professor (Mechanical Engineering); Computational Structural Mechanics, High Impact and Blast analysis, Computational Methods

David McDaniel, Research Assistant Professor (Mechanical Engineering); High Performance Computing, Unstructured Meshes

Robert Meakin, Professor (Mechanical Engineering); Fluid Mechanics, Multiple-Body Dynamics, Computational Geometry, Domain Connectivity, and Computational Science and Engineering Software Project Management

Charles Monroe, Assistant Professor (Materials Science and Engineering); Simulation and Modeling of the Metals Casting Process

Hassan Moore, Assistant Professor (Mechanical Engineering); Mathematical Education, Fiber Optics and LIDAR Research

Lee Moradi, Director of Engineering for Center for Biophysical Sciences and Engineering; Structural Mechanics, Mechanical Systems, Vibrations

Robert H. Nichols, Research Professor (Mechanical Engineering); Computational Fluid Dynamics, Turbulence Modeling, Grid Generation Software

Tina Oliver, Assistant Professor (Mechanical Engineering); Mechanical Systems, Vehicle Dynamics and Design

Selvum Pillay, Associate Professor (Materials Science and Engineering); Composites Manufacturing and Plastics Engineering

Doug Ross, Assistant Professor (Mechanical Engineering); Computer-aided Geometry Design and Mesh Generation

Nick Santoro, Research Associate Professor (Mechanical Engineering); Power Generation, Finite Element Analysis, and Structural Analysis

Bharat Soni, Chair and Professor (Mechanical Engineering); Computational Structures and Fluid Dynamics, Mesh Generation

Hessam Taherian, Assistant Professor (Mechanical Engineering); Energy Efficiency, Solar-Thermal Water and Space Heating and Cooling, Building Energy Modeling, Heat Exchangers

Uday Vaidya, Professor (Materials Science and Engineering); Composite Material Characteristics, Testing, and Manufacturing Processes

Vladimir V. Vantsevich, Professor (Mechanical Engineering); Mechatronics, Vehicle, and Robotics Engineering

Peter M. Walsh, Research Professor (Mechanical Engineering); Combustion and gasification for industrial process heat and electric power generation, Carbon sequestration, Emissions control

M.S.M.E. Program Requirements

A bachelor's degree from an accredited (or equivalent) program in engineering or the physical sciences is required for admission to graduate study in mechanical engineering. The usual criteria for admission in good standing follow:

- Not less than B-level scholarship overall or over the last 60 semester hours of earned credit; and
A minimum of 150 on quantitative and 151 on verbal portions of the GRE revised General Test (630 quantitative and 460 on the GRE General Test prior to August 2011). In addition, for foreign nationals, a minimum score of 80 (IBT) on the TOEFL is required. Other standardized examination scores will also be considered.A student not meeting these requirements may also be admitted, perhaps on probationary status, provided other information indicating likely success in the program is provided.

A student with an undergraduate degree in a field of engineering other than mechanical or in the physical sciences may also be accepted into the mechanical engineering program. However, such a student will normally have to take additional, preparatory coursework as part of an expanded plan of study (see "Preparatory Courses" later in this section).

PLAN I (Thesis Option)

1. The student must successfully complete at least 24 semester hours of coursework, including (in addition to the general Graduate School requirements)
   - Six semester hours in committee-approved* mathematics courses
   - Eighteen semester hours in committee-approved* mechanical engineering courses or approved related courses, including at least three semester hours in a course outside the student's research or specialization area.
2. The student must register for at least 6 hours of ME 699 Thesis Research in addition to the 24 semester hours of course work.
3. The student must successfully complete and defend a thesis.

   * Before the first graduate semester at UAB, the Graduate Coordinator will advise new students regarding courses for the first semester. Before the end of the first semester, students will be assigned a Thesis Director based on research interest, and students will assemble their graduate committees. The committee will consist of the Graduate Coordinator, the Thesis Director, and two graduate faculty members with experience or expertise related to the student's thesis topic. The Thesis Director in coordination with the graduate committee will set the curriculum for the student.

PLAN II (Non-thesis Option): Research/Design Emphasis

Generally, Plan II will be approved for students working full-time and attending UAB on a part-time basis or when the student demonstrates that Plan II offers superior educational benefits. After 15 credit hours of course work are completed, the student should select a project director and begin work on the final project. The election of Plan II must be approved by the student's graduate advisor.

1. The student must successfully complete at least 33 semester hours of coursework, including
   - Six semester hours in approved mathematics courses
   - A minimum of 27 semester hours in approved mechanical engineering courses or approved related courses. Out of these 27 semester hours, students must enroll in:
   - at least three (3) semester hours in a course outside the student's research or specialization area
   - at least three (3) hours of ME 698 Non-Thesis Research involving design or research
2. The student must make a presentation on the research project and submit a final report which must be approved by the project director.

PLAN II (Non-thesis Option): Technology/Engineering Management Emphasis

1. The student must successfully complete at least 33 semester hours of coursework, including
   - At least three semester hours in approved mathematics courses
   - At least six semester hours in approved mechanical engineering courses
   - At least six semester hours in one of the following two management applications areas: MBA 660 Business Statistics and either EC 520 Applied Forecasting or another approved advanced management course
   - Three semester hours in MBA 632 Managerial Process/Behavior
   - At least three semester hours in ME 698 Non-Thesis Research, involving design or research
   - At least nine semester hours of engineering-oriented management coursework. Approved courses include: CE 658 Engineering Management, EE 585 Engineering Operations, EE 686 Technical Entrepreneurship I, EE 687 Technical Entrepreneurship II, and ME 601 Design Measurement and Enhancement of Work Systems
2. The student must make a presentation on the research project and submit a final report which must be approved by the project director.

Preparatory Courses

Students admitted to the graduate program in mechanical engineering without an undergraduate degree in mechanical engineering or who have not had the courses listed below must take the following courses or present equivalent prior coursework. Additional coursework may be required depending on the courses the student has taken during his/her undergraduate degree and the area of specialization for Masters.

ME 241 Thermodynamics I
ME 321 Introduction to Fluid Mechanics
ME 322 Introduction to Heat Transfer
ME 360 System Modeling and Controls
ME 370 Kinematics and Dynamics of Machinery
ME 371 Machine Design
CE 220 Mechanics of Solids

Additional Information

Deadline for Entry Term(s):	Fall: July 1, Spring: November 1, Summer: April 1
Deadline for All Application Materials to be in the Graduate School Office:	Six weeks before term begins

Number of Evaluation Forms Required:	Three
Entrance Tests:	GRE General Test (TOEFL is also required for international applicants whose native language is not English.)

For detailed information, contact Dr. Bharat Soni, Department of Mechanical Engineering, BEC 257, 1530 3rd Avenue South, Birmingham, Alabama 35294-4461.

Telephone: 205-934-8460

E-mail: bsoni@uab.edu

Web: http://www.uab.edu/engineering/departments-research/me/graduate

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit.

Mechanical Engineering (ME)

511. **Intermediate Fluid Mechanics**. Applications of fluid dynamic principles to engineering flow problems such as turbo-machinery flow and one-dimensional compressible flow. Vorticity and viscosity, potential flow, viscous flow, Navier-Stokes, solutions and boundary layers. Introduction to Fluid Mechanics or equivalent is a recommended prerequisite for this course.

521. **Introduction to CFD Basics.** Governing equations for fluid flows, classifications of flow regimes, and approaches to analyze fluid flow problems. Introduction to Computational Fluid Dynamics (CFD), mesh generation, boundary conditions, numerical solution of equations governing fluid flows, and visualization. Hands-on exercises using a commercial CFD solver.

530. **Vehicular Dynamics**. Introduction to the basic mechanics governing vehicle performance, analytical methods, and terminology. Dynamics or equivalent is a recommended prerequisite for this course.

545. **Combustion**. Evaluation of the impact of fuel characteristics and operating conditions on the performance of coal-fired electric utility boiler furnaces and the prospects for continued reliance on coal as fuel for electric power generation. The phenomena emphasized are the behavior of turbulent jets; ignition, devolatilization, and combustion of coal particles; radiative heat transfer and the effect of ash deposits on heat transfer; formation of air pollutants and their removal from combustion products; and

capture and sequestration of carbon dioxide. Thermodynamics II or equivalent and Introduction to Heat Transfer or equivalent are recommended prerequisites for this course.

548. **Internal Combustion Engines**. Fundamentals of reciprocating internal combustion engines: engine types, engine design and operating parameters, thermochemistry of fuel-air mixtures, properties of working fluids, ideal models of engine cycles, engine operating characteristics, gas exchange processes, fuel metering, charge motion within the cylinder, combustion in spark-ignition and compression ignition engines. Thermodynamics II or equivalent is a recommended prerequisite for this course.

549. **Power Generation.** Application of thermodynamics, fluid mechanics and heat transfer to conversion of useful energy. Includes terrestrial and thermodynamic limitations, fossil fuel power plants, renewable energy sources, and direct energy conversion. Thermodynamics or equivalent is a recommended prerequisite of this course.

554. **Heating, Ventilation and AC.** Fundamentals and practice associated with heating, ventilating, and air conditioning; study of heat and moisture flow in structures, energy consumption, and design of practical systems. Introduction to Heat Transfer or equivalent is a recommended prerequisite for this course.

555. **Thermal Fluid Systems Design.** Comprehensive design problems requiring engineering decisions and code/ standard compliance. Emphasis on energy system components: piping networks, pumps, heat exchangers. Includes fluid transients and system modeling. Introduction to Heat Transfer or equivalent is a recommended prerequisite for this course.

564. **Introduction to Finite Element Method**. Concepts and applications of finite-element method. Development and applications of basic elements used in engineering mechanics. Use of finite-element analysis software. Application of finite-element concept to several areas of mechanics. Mechanics of Solids or equivalent is a recommended prerequisite for this course.

575. **Mechanical Vibrations**. Free and forced single-degree-of-freedom systems. Multi-degree-of-freedom systems. Simple continuous systems.

590. **Special Topics in (Area).** 1-4 hours.

601. **Design, Measurement, and Enhancement of Work Systems**. Systems involving human performance.

610. **Inviscid Fluid Mechanics**. Kinematics and dynamics of real and perfect fluids. Potential flow around bodies. Flow-field solution techniques.

611. **Advanced Fluid Mechanics I**. Fundamental laws of motion for viscous fluid, classical solutions of the Navier-Stokes equations, inviscid flow solutions, laminar boundary layers, and stability criteria.

613. **Introduction to Computational Fluid Dynamics**. Review of governing equations of fluid dynamics, mathematical behavior of partial differential equations, basic aspects of discretization, basic CFD techniques, basic grid generation, coordinate transformations, advanced numerical schemes, future CFD methodology. A knowledge of a computer language is required.

614. **Advanced Computational Fluid Dynamics**. Finite Volume Scheme, Eigen values and Eigenvectors, Method of Characteristics, Upwind Schemes, Flux Vector Splitting, Flux Difference Splitting, Explicit and Implicit Schemes, Flux Jacobians, Newton Method, Boundary Conditions, Weak Solutions, TVD, PISO Methods.

615. **Introduction to Turbulent Flows**. Characteristics of turbulence, length and time scales, energy cascade, vorticity stretching, Reynolds averaging technique, Closure problem, Boussinesq hypothesis, Eddy viscosity concepts, introduction to zero-, one-, and two-equation models, Reynolds stress model.

642. **Statistical Mechanics**. Explanation of macroscopic thermodynamic and transport properties, based upon classical and quantum mechanical descriptions of elementary particles, atoms, and molecules. Analysis of the distributions of these objects over their allowed energy states and the relationships between those distributions and macroscopic properties. Thermodynamics II or equivalent is a recommended prerequisite for this course.

650. **Transport Phenomena**. Laminar flow transports: momentum transfer (Couette/Poiseuille flows), energy transfer (free/forced convections and conductions), and mass transfer; equation of state, turbulence, chemical reactions, and numerical methods solving transport equations. Introduction to Fluid Mechanics or equivalent and Introduction to Heat Transfer or equivalent are recommended prerequisites for this course.

653. **Convection Heat Transfer**. Equations of convective heat transfer. Boundary layer equations. Internal and external laminar flows. Turbulent flows. Natural convection and combined convection. Convective heat transfer through porous media.

661. **Math Methods in Engineering I**. Mathematical theory and solutions methods to problems in engineering including advanced ordinary differential equations; eigenvalue problems; multi-variable calculus and implicit functions; curve, surface ad volume representation and integration; Fourier integrals and transforms; separation of variables and transform techniques for solution of partial differential equations. Differential Equations or equivalent is a recommended prerequisite for this course.

662. Math Methods in Engineering II. Mathematical theory and solution methods to problems in engineering including Scalar and vector field theory advanced partial differential equations, analysis using complex variables, conformal mapping, complex integral calculus, Green's functions, perturbation methods, and variational calculus. ME 661 Math Methods in Engineering I or equivalent is a prerequisite for this course.

665. **Computational Methods in Mechanical Engineering.** Applications of computers to solution of problems in engineering, including matrices, roots of equations, solution of simultaneous equations, curve fitting by least squares, differentiation and integration, differential and partial differential equations Differential Equations or equivalent and Introduction to Computational Engineering or equivalent are recommended prerequisites for this course.

670. **Introduction to Continuum Mechanics**. Fundamentals and application of mechanics principles to problems in continuous media. Matrix and tensor mathematics, fundamentals of stress, kinematics and deformation of motion, conservation equations, constitutive equations and invariance, linear and nonlinear elasticity, classical fluids, linear viscoelasticity. Mechanics of Solids or equivalent and Differential Equations or equivalent are recommended prerequisites for this course.

679. **Advanced Finite-Element Analysis**. Concepts and applications of finite-element method. Development and applications of various elements used in engineering mechanics. Use of finite-element analysis software. Application of finite-element concept and model development to fluid, heat transfer, and solid mechanics problems. Introduction to Fluid Mechanics or equivalent, Introduction to Heat Transfer or equivalent, and Mechanics of Solids or equivalent are recommended prerequisites for this course.

680. **Numerical Mesh Generation**. Mesh generation strategies, error analysis, and their role in field simulation systems and engineering applications, Structured and Unstructured meshing algorithms including algebraic, elliptic, parabolic, hyperbolic, advancing front, and Delaunay triangulation methods, computer aided geometry techniques and surface mesh generation schemes.

682. **Computer-Aided Geometry Design**. Bezier curves, polynomial interpolation, splines, NURBS, tensor product Bezier surfaces, composite surfaces, differential geometry, parametric curves and surfaces, decimation and refinement algorithms.

686. **Design Optimization Techniques**. Methods of numerical optimization techniques applied to engineering design. Methods for optimization of constrained and unconstrained, single and multiple variables, multiobjective functions. Surrogate-based statistical optimization and multidisciplinary optimization framework. 690. **Special Topics in (Area)**. 1-4 hours.

691. **Individual Study in (Area)**. 1-4 hours.

693. **Journal Club in Mechanical Engineering**. 1 hour.

694. **Mechanical Engineering Seminar**. 1 hour.

698. **Non-Thesis Research**. 1-12 hours.

699. **Master's Thesis Research**. Prerequisite: Admission to candidacy. 1-12 hours.

Administration Health Services (DSc., Ph.D.)

Degrees Offered:	D.Sc., Ph.D.
Co-Director:	Dr. Robert Hernandez (School of Health Professions)
Co-Director:	Dr. Susan K. Key (School of Business)
Phone:	(205) 934-3113
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Web:	http://main.uab.edu/Shrp/Default.aspx?pid=77128 (School of Health Professions)http://main.uab.edu/sites/business/ (School of Business)

Faculty

Nell Adkins, Associate Professor (Accounting); Corporate Taxation, Market Effects of Taxation, Mergers and Acquisitions, Valuation of Intangible Assets

Eta Berner, Professor (Health Informatics); Evaluation of Clinical Decision Support Systems and Other Health Information Technologies

Janet M. Bronstein, Associate Professor (Health Care Organization and Policy); Public Health Policy, Social and Ethical Issues in Health Care, Medicaid

Jeffrey Burkhardt, Associate Professor (Health Services Administration); Health Care Finance, Applied Health Economics

Vicki Cox-Edmondson, Associate Professor (Management): Strategy, Entrepreneurship, Corporate Social Responsibility and Business Ethics, Organizational Behavior, and Constraints Management

Thomas DeCarlo, Professor, Ben S. Weil Chair in Industrial Distribution (Business); Strategic Issues in Sales Force development and Management, Interpersonal Persuasion and Decision Making, Marketing Communications

W. Jack Duncan, University Scholar and Professor (Management, Health Care Organization and Policy); Administrative Theory, Strategic Management of Health Care Organizations, Organizational Internal Analysis

Peter M. Ginter, Professor (Health Care Organization and Policy, Management); Strategic Management of Health Care Organizations and Government Agencies, Macroenvironmental Analysis

Gerald L. Glandon, Professor (Health Services Administration); Health Economics,Technology Evaluation, Policy Analysis

S. Robert Hernandez, Dr.P.H. (Professor and Director) Doctoral Program in Administration-Health Services for the School of Health Professions. Strategic Planning for Health Care Organizations, Health Care Organization Theory, Human Resources Management

Tee H. Hiett, Professor Emeritus (Health Services Administration); Health Care Computer Applications, Data Processing in Health Care

Robert E. Holmes, Professor (Management); Business Education and Reform, Entrepreneurship, Strategic Management

Howard W. Houser, Professor (Health Services Administration) History of Health Care Systems, General Administration, Comparative Health Systems

Eric Jack, Associate Professor (Operations Management); Project Management, Operations Planning and Management

Karen Kennedy, Associate Professor (Marketing); Cognitive Research, Diversity, Services Marketing, Organizational Culture, Interpersonal Trust Development, Qualitative Research Methods

Joshua C. Klapow, Assistant Professor (Health Care Organization and Policy); Outcome Evaluation, Health Related Quality of Life, Health Care Delivery Systems, Behavioral Medicine, Chronic Illness, Provider Behavior

Seung-Dong Lee, Professor (Economics); Microeconomics in Nonprofit Organizations, Econometric Studies in Health Care, International Economics

Warren S. Martin, Professor (Marketing); Survey Research, Marketing Strategy, Professional Sales Strategy, Decision Making

Stephen Mennemeyer, Associate Professor (Health Care Organization and Policy); Health Economics, Competitive Bidding, Cost-Effectiveness, Outcomes Research

Michael A. Morrisey, Professor (Health Care Organization and Policy); Health Economics, Health Care Markets, Health Insurance, Managed Care

George M. Munchus, Professor (Management); Human Resources Management, Labor Relations, Arbitration and Mediation

Philip Musa, Associate Professor (Information Systems); Knowledge Management; Systems Thinking

Steven J. O'Conner, Associate Professor (Health Services Administration); Health Care Policy and Management, Service Quality and Orientation, Stakeholder Analysis

Thomas L. Powers, Professor (Marketing); International Product Innovation, Marketing Strategy, Services Marketing, Industrial Marketing

Julio C. Rivera, Associate Professor (Information Systems); Telecommunications and Systems Analysis, Student and Faculty Computing Resources

Bisakha Sen, Assistant Professor (Health Care Organization and Policy); Health Economics, Labor Economics, Applied Microeconomics

Richard M. Shewchuk, Professor (Health Services Administration); Community-Based Intervention Development, Health and Long-Term Care Issues in Aging, Quantitative Methods

Tommie Singleton, Associate Professor (Information Systems); Systems Analysis and Design, Forensic Auditing and Systems Structure

Deborah W. Tanju, Professor (Accounting); Internal Auditing, Financial Accounting

Program Information

The Ph.D. program in Administration–Health Services is a degree program offered jointly and cooperatively by the Department of Health Services Administration in the School of Health Professions

and the Graduate School of Management in the School of Business. Faculty associated with the School of Public Health, School of Medicine, Lister Hill Center for Health Policy, Center for Outcomes and Effectiveness Research and Education, and Center on Aging also contribute to student learning.

The Ph.D. program is for those who wish to pursue the conceptual, philosophical, and applied aspects of administrative processes in health services, health policy, and outcomes research in health care. It provides doctoral-level study and research in administration with specific application to health services. The pedagogical focus is on developing a strong research orientation through course work, research seminars, and development of mentoring relationships. Students may choose a specialization in either strategic management or health services research. Students who are interested in pursuing academic careers are also afforded the opportunity to develop their teaching skills through course work and teaching opportunities. Job placement occurs in regional, national, and international markets. To date, over 80 graduates have taken positions in academic institutions as well as health service delivery, governmental, and consulting organizations.

Admission Requirements

An applicant should already possess a master's degree in a relevant discipline or have completed an undergraduate program with an outstanding record. Completed applications of well-qualified candidates received by January 15 may be considered for early admission. The application deadline is March 1st. Although applications may be considered after March 1st, admission and financial aid priority is given to those applicants whose materials are complete by March 1st. Applications submitted after March 1st would be considered on a space-available basis only.

Admission recommendations are made by the Admissions and Policy Committee after examination of the candidate's qualifications, which should include a minimum GRE General Test score of 1,000 (verbal plus quantitative) or a GMAT test score of 550. All applicants whose first language is not English are also required to submit a score for the Test of English as a Foreign Language (TOEFL). A TOEFL score of 80 is required if the TOEFL taken is based on the internet version, if computer-based, the minimum score required is 213 and if the paper-based test version is taken, the minimum acceptable score is 550 or above**.** Consideration will also be given to the quality of the applicant's academic record, previous research experience and productivity, and estimated research potential as indicated by references.

Various forms of financial aid are available to students. Departmental research assistantships are awarded on a competitive basis and carry an obligation of 20 hours of work per week. Assistantships are awarded to incoming students for a period of one year, and may be renewable for a second year based on satisfactory work and academic progress, depending on the availability of funds. Some students are able to secure funding for additional years in the program through research assistant positions or other

part-time jobs funded by faculty members' grants and contract activities. Other forms of financial assistance include minority fellowships offered through the UAB Graduate School, paid teaching opportunities in selected undergraduate programs, and federal student loans.

Prerequisites

Prerequisite requirements include one graduate-level statistics course with computer usage, one graduate-level course on the U.S. health care system, and an introductory healthcare finance course. Incoming students who have not met these prerequisites during a master's program may take courses prior to entering the program or during their first year of study in the program.

>Program of Study

The program of study consists of five components (1) courses in administration and health systems, (2) courses in research methodology and statistics, (3) specialization courses, (4) comprehensive examinations, and (5) the doctoral dissertation. Specializations are currently available in strategic management and health services research. Students must complete all coursework in the first three areas and pass a comprehensive examination in each before work can officially begin on the dissertation. The investigation and other special work leading to the dissertation must be performed directly under the guidance and supervision of a five-person committee of the UAB graduate faculty. The normal minimum period in which the doctoral degree can be earned is three to four years of full-time study.

Degree Completion

The granting of the Ph.D. degree is based on completion of all required coursework, residency requirements, comprehensive examinations, dissertation requirements, and the recommendation of the Administration–Health Services graduate program director and the dissertation committee.

Mission, Vision, and Values Statements

Because outstanding teaching and research are essential to the future of health care delivery in our nation and abroad, the Ph.D. program in Administration–Health Services provides doctoral-level training to individuals who will be our future health care leaders in academic and nonacademic research organizations.

We seek to recruit a diverse and talented group of national and international students who are attracted to careers in research and teaching. The educational experience in the Ph.D. program is characterized by exposure to the various disciplines relevant to health administration and policy from across the university, as well as one-on-one mentorship relationships with faculty. These experiences are expected to serve as a foundation for future research throughout the graduate careers.

Additional Information

Deadline for Entry Term(s):	January 15th
Deadline for All Application Materials to be in the Graduate School Office:	March 15
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE or GMAT (TOEFL also required for international applicants whose native language is not English.)
Comments	Stipend support available

Contact Information

For detailed information, contact the Program Office of the Doctoral Program in Administration–Health Services Program, UAB School of Health Professions, Webb Building, Room 564, 1675 University Boulevard, Birmingham, AL 35294-3361.
Telephone 205-934-3113
Fax 205-975-6608
E-mail **phdha@uab.edu**
Web **www.hsa.uab.edu**

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit. Courses numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

Administration–Health Services (AH)

700. Health Economics. Economic concepts and their relevance to health care industry; financing and delivery arrangements employed in the U.S. health care system; role of economic factors in the development of public policy and implications of changes in public policy.

701. Administrative Theory. Covers the history of administrative theory and management as well as recent contributions and current issues in administrative theory and management; focus is on understanding the evolution of management thought and research and on developing areas of research interest that will contribute to the field.

702. Growth and Development of the U.S. Health Care System. Historical development of U.S. health care system; implications for solutions of current problems.

703. Philosophy of Science. Systems of thought and activities in the theory-building process, deriving hypotheses from the literature, understanding scientific theory, philosophy of science; applications to health services administration.

704. Multivariate Analysis. Survey course on the application of multivariate statistical techniques; emphasis on application to health-related research questions and interpretation.

705. Health Care Finance. Financial management functions, third-party reimbursement, determination of costs and charges, analysis of financial positions, working capital management, budgeting, capital expenditure analysis, and case studies.

706. Strategic Management Theory and Research. Overview of current and historically important research in field of strategic management, including major streams of research, role of strategic management in management disciplines, relationships to other disciplines, and pedagogical approaches used in graduate and undergraduate strategy courses.

707. Research Methods. Issues of research design and research methods for organizational studies and health services research; integrates knowledge from quantitative courses with areas of research interest in the students' chosen fields.

712. Research in Organizational Behavior. Examination of topics and empirical research in organizational behavior; emphasis on important issues in the field, including areas of controversy and contemporary interest.

714. Marketing Strategy and Research. Examination of development of marketing strategy and strategic management process; research topics and implications of literature are explored.

715. Research in Organizational Theory. Topics and research in organization and management theory applied to health services organizations, including organization-environment relations, population ecology, interorganization relations, and strategic alliances.

716. Macroenvironmental Analysis. Examination of research literature that addresses external and internal environmental factors affecting strategic management.

718. Strategic Information Systems. Examination of current research on role of information systems in strategic management.

***720. Doctoral Seminar**. Presentations by faculty and Ph.D. candidates concerning current issues in particular areas of specialization. 1 hour.

722. Regression Analysis. Various approaches to regression analysis, including ordinary least squares and probability models such as logit and probit.

775. Strategic Planning and Management in Health Services. Assessment of strategic management literature applied to health services organizations; exploration of strategy formulation, strategic content, and implementation and evaluation topics for health care organizations.

***790**. **Independent Study and Research**. 1-12 hours.

***798**. **Nondissertation Research**. 1-6 hours.

***799**. **Dissertation Research**. Prerequisite: Admission to candidacy. 1-6 hours.

Biotechnology (M.S.)

Degree Offered:	M.S.
Director:	Dr. Kathy Nugent (Biotechnology)
Phone:	(205) 934-7384
Email:	knugent@uab.edu
Web site:	http://www.uab.edu/cds/academic/graduate/biotech

Faculty

Joanne Brock, Assistant Professor

Michelle Brown, Assistant Professor and Clinical Education Coordinator (CLS-PE); Body Fluids, Immunohematology

Todd Casanova, Associate Professor and Director (Interim; CLS-PE); Hematology, Hemostasis, Molecular Diagnostics

Janelle M. Chiasera, Professor and Acting Chair (Clinical Chemistry)

Joseph Garner, Assistant Professor

Pat Greenup, Associate Professor (CLS-PE); Laboratory Management, , Health and Safety, Instrumentation and Automation, Technology Assessments, Scientific Publications

Linda H. Jeff, Associate Professor (CLS-PE); Clinical Microbiology; Immunology, Educational Methodology, Clinical Correlations

Kathy Nugent, Assistant Professor

Vivian Pijuan-Thompson, Associate Professor

Tino Unlap, Associate Professor (Clinical and Diagnostic Sciences); Biotechnology; Recombinant DNA, Protein Chemistry

Program Information

Program Mission

The faculty members of the Biotechnology Program are devoted to providing an excellent service to the community and its graduates. The faculty, in its concern for the health and safety of the general public, is committed to ensuring that each student develops knowledge, skills, and values essential to the appropriate role providing the basis for continuing intellectual and professional growth.

Out of a great concern for applied technology and the role that it plays in the diagnosis, management and treatment of human disease, and in developing products to solve problems for present and future generations, the Program is designed to provide instruction through didactic and practical training in order to ensure that its graduates possess the critical knowledge and skill sets that are required for intellectual and professional growth in the future.

Biotechnology

The Master of Science degree and certificate options in Biotechnology are designed to prepare a diverse student body for careers in various fields involving biotechnology and its related sciences. This program is designed to provide students with broad training and education in scientific principles and knowledge underlying biotechnology, scientific principles and knowledge underlying emerging diagnostic technologies associated with biotechnology, basic laboratory techniques in biotechnology, instrumentation and automation principles used in the biotechnology industry, and legal, regulatory and marketing issues in biotechnology.

The Biotechnology Program consists of a Master of Science option and a Graduate Certificate option that requiring 3 semesters for completion as full-time students. The Master of Science option requires 34

credit hours and is designed for individuals who hold a Bachelor of Science degree in a related discipline including biology, chemistry, biochemistry, physics, engineering, mathematics, psychology and sociology.

The Graduate Certificate option requires 20 credit hours and is designed for individuals who wish to obtain only a certificate in biotechnology (not an M.S. in CLS) in order to either find a position in the Biotech/Pharma Industry or to advance in their current position in the Biotech/Pharma or related industries.

M.S. Admission Requirements

In addition to the general Graduate School admission requirements, applicants to the M.S. program must:

- have a biology, chemistry, or a related major from an accredited college or university if applying for the Professional Entry Program,
- have a minimum undergraduate GPA of 3.0 (A = 4.0), computed from all undergraduate credits or from the last 60 semester hours of undergraduate course credit,
- have scores of at least 500 in each of the verbal and quantitative sections of the GRE General Test,
- provide a written statement of career goals,
- complete an interview with the program admissions committee,
  If foreign-educated, have a score of at least 550 for paper version (or 80 for Internet version; or 213 for computer version) on the TOEFL, submit a transcript evaluation from World Education Services (WES) at **www.wes.org**

If accepted, students must complete the UAB medical history questionnaire and physical, provide proof of required immunizations, and receive satisfactory screening by the UAB Medical Center Student Health Service before enrollment.

Persons with a Bachelor of Science degree may be eligible to register for courses as non-degree seeking graduate students before acceptance into the M.S. program. If a non-degree seeking graduate student meets the M.S. program admission requirements, up to 12 semester hours of approved non-degree graduate coursework may be accepted for the M.S. degree. Admission of a student to any course as a non-degree student does not constitute admission to the M.S. degree program.

Essential Requirements

Fundamental tasks, behaviors, and abilities necessary to successfully complete the requirements of the Program are available upon request from the CLS program office. If you have a disability, but have not

contacted Disability Support Services (DSS), please call 934-4205 or visit DSS at 516 Hill University Center or **http://students.uab.edu/dss**.

Additional Information:

Entry Term:	Fall semester
Deadline for All Application Materials to be in the Graduate School Office:	Six weeks before term begins
Number of Evaluation Forms Required:	None
Entrance Tests	GRE and for international applicants from non-English speaking countries, scores for the Test of English as a Foreign Language (TOEFL) and the Test of Written English(TWE)
Comments	Financial aid (fellowship, stipend or assistantship) is not available from the program; scholarship availability is limited; transcript evaluation by WES is required for applicants with foreign university degrees

Contact Information

For detailed information, contact the Department of Clinical and Diagnostic Sciences, Clinical Laboratory Sciences Program, UAB School of Health Professions, SHPB 430, 1705 University Blvd., Birmingham, Alabama 35294-1212.

Telephone 205-934-3209.

E-mail AskCDS@uab.edu

Course Descriptions

Clinical Laboratory Sciences (CLS)

Biotechnology Courses

*** Upon approval**

**** Required courses for certificate**

***** Upon Approval**

****CLS 500. Health and Safety Management. – Online Course.** Review of infection control principles focused on bloodborne, airborne, drug-resistant and opportunistic pathogens, and general health and safety guidelines and standards. Prerequisites: Open to all graduate students. 1 hour.

****CLS 506. Laboratory Techniques.** Overview of issues and skills surrounding working in the modern laboratory environment; includes safety, collection of specimens, equipment, mathematics, measurements, microscopy, dilutions, quality assurance, basic spectrophotometry, phlebotomy, automation of laboratory testing and lab computers. 2 hours.

****CLS 526. Instrumentation and Automation.** This course includes the study of the theory and principles of automation and instrumentation used in laboratories. An emphasis will be placed on quality control, quality assurance, instrumentation principles, basic statistics, and the regulatory, and economic issues encountered in laboratories including, clinical labs, health labs, government labs, private labs and other laboratories. 3 hours.

****CLS 527.Instrumentation and Automation Lab**. This course includes the practical application of automation and instrumentation used in laboratories. An emphasis will be placd on quality control, quality assurance, instrumentation principles, basic statistics, and the regulatory, and economic issues encountered in laboratories including, clinical labs, health labs, government labs, private labs and other laboratories. 1 hour.

****CLS 542. Molecular Diagnostics**. Overview of nucleic acid structure, gene expression and genetic disease. Principle and performance of DNA and RNA isolation, amplification, hybridization, and analysis. Applications in microbiology, prenatal diagnosis, cancer management, transplantation, paternity testing, thrombosis risk testing and forensic medicine. 4 hours.

****/***CLS 545. Protein Chemistry.** This course focuses on applications of protein chemistry and examines the structure of proteins, their function, their binding to other molecules and the methodologies for the purification and characterization of proteins. 2 hours.

****/***CLS 555. Immunology.** Overview of the function of the innate defense mechanism, antigens, antibodies, development of the immune system, lymphocytes, immunoglobulins, lymphokines and inflammation. Includes discussion of advanced concepts of B-and T- lymphocyte ontogeny, generation and antibody diversity and genetics of the major histocompatibility complex, cytokine network and immunogenetics. 2 hours.

****CLS 637. Emerging Diagnostic Technologies.** This course covers emerging diagnostic technologies for use in clinical laboratories, including methods for molecular microbiology, oncology, hematology,

genetics, and identity testing; flow cytometry, automation, and robotics. Review of rapid tests and new in vitro methodologies; economic factors; regulations and licensing issues; accreditation criteria; and social, ethical, and legal issues associated with emerging in vitro diagnostic technologies. Prerequisite: Permission of Instructor. 2 hours

CLS 640. Biotechnology Regulations and Quality Systems. This course provides an overview of regulatory and quality systems requirements for drugs, biologics, medical devices or combination products; includes guidance and compliance requirements with GXP (Good Laboratory/Clinical/Manufacturing Practices), Quality Systems Regulations, responsible conduct in human/animal research, inspection processes (FDA, ISO, CLIA), intellectual property and related ethical and legal issues such as dual use biodefense countermeasures development and distribution. 3 hours

****/*****CLS 655. Recombinant DNA.** This course will cover the following general topics: DNA as the primary genetic material, information flow from DNA to protein, control of gene expression, basic tools for recombinant DNA, fundamental features of Eukaryotic genes, mobile DNA sequences in the genome, regulation of gene action by RNA interference, genome analysis, finding human disease genes, understanding the genetic basis for cancer, and DNA fingerprinting and forensics. 3 hours.

CLS 693. Scientific Publications Analysis. Review and scientific critique of current literature related to laboratory medicine, overview of research design and interpretation of statistics, sources of publication journals and government documents, content and style of scientific papers, writing of grant proposal and scientific poster presentation.3 hours

CLS 698. Master's Level Thesis/Non-Thesis Research. Completion of research paper that is based on an original research project. 4 hours

Professional Entry Courses

*** Courses may be repeated for credit with defined stipulations**
**** Courses not open to non-degree graduate students**
***** Upon Approval**

CLS 500. Health and Safety Management. – Online Course. Review of infection control principles focused on bloodborne, airborne, drug-resistant and opportunistic pathogens, and general health and safety guidelines and standards. Prerequisites: Open to all graduate students. 1 hour.

CLS 503. Body Fluids. Diagnosis and monitoring of renal and systemic disease through the physical, biochemical, and microscopic analysis of urine and feces. Diagnosis of central nervous system and systemic disease through cerebrospinal fluid analysis. Diagnosis of metabolic and infectious disease

through analysis of peritoneal fluid, synovial fluid, transudates, and exudates. Fertility testing using semen analysis. 1 hour.

CLS 504. Body Fluids Laboratory. Diagnosis and monitoring renal and systemic disease through the physical, biochemical, and microscopic analysis of urine and feces. Diagnosis of central nervous system and systemic disease through cerebrospinal fluid analysis. Diagnosis of metabolic and infectious disease through analysis of peritoneal fluid, synovial fluid, transudates, and exudates. Fertility testing using semen analysis. 1 hour.

CLS 505. Laboratory Management. Roles and functions of clinical laboratories and practitioners; professionalism and ethics; educational methodology and training; professional and interpersonal communication; behavioral aspects of management; leadership styles and management theory; team-building; legal issues related to employment; recruitment, interview and selection of personnel; organizational culture and behavioral change; laboratory operations; safety, governmental regulations, standards and compliance; marketing, outreach, and business plan; budget, cost analysis, reimbursement; critical pathways, decision-making, test utilization; performance improvement, quality assessment; risk management, evidence-based laboratory medicine. 3 hours.

CLS 506. Laboratory Techniques. Overview of issues and skills surrounding working in the modern laboratory environment; includes safety, collection of specimens, equipment, mathematics, measurements, microscopy, dilutions, quality assurance, basic spectrophotometry, phlebotomy, automation of laboratory testing and lab computers. 2 hours.

CLS 518. Immunology. --Physiology of immune responses to infectious agents, tumors, transplants; abnormal responses: hypersensitivity, autoimmunity, immunoproliferative disorders, and immunodeficiencies; antigen-antibody reactions; complement; applications of immunology tests. 4 hours.

CLS 519. Immunology Lab. Specimen requirements, principle, procedure, clinical significance, and sources of error of common clinical immunology tests; performance and interpretation of tests; application of results to clinical situations. 1 hour.

CLS 523. Clinical Microbiology. Reservoirs, modes of transmission, disease associations, and morphological and biochemical characteristics of microorganisms commonly isolated in the clinical laboratory; methods used to isolate and identify bacteria, parasites, and fungi 3 hours.

CLS 524. Clinical Microbiology Lab. Performance of techniques and tests used in the isolation and identification of bacteria, fungi, and parasites commonly seen in a clinical microbiology laboratory. 1 hour.

CLS 526. Instrumentation and Automation. This course includes the study of the theory and principles of automation and instrumentation used in laboratories. An emphasis will be placed on quality control, quality assurance, instrumentation principles, basic statistics, and the regulatory, and economic issues encountered in laboratories including, clinical labs, health labs, government labs, private labs and other laboratories. 3 hours.

CLS 527. Instrumentation and Automation Lab. This course includes the practical application of automation and instrumentation used in laboratories. An emphasis will be placed on quality control, quality assurance, instrumentation principles, basic statistics, and the regulatory, and economic issues encountered in laboratories including, clinical labs, health labs, government labs, private labs and other laboratories. 1 hour.

CLS 528. Hematology I.--Systematic examination of blood cells: normal function; recognizing their microscopic appearance; blood cell disorders; standard and special clinical hematology laboratory procedures; validation of laboratory data; interpretation of results, quality assurance. 4 hours.

*****CLS 530. Immunohematology.** This course covers blood group antigen-antibody reactions; donor blood collection and testing; serological characteristics and immunogenetics of the major blood group systems; pretransfusion testing, basic and advanced techniques of antibody identification and problem-solving; transfusion therapy; laboratory evaluation of hemolytic disease of the newborn; and the investigation of immune coating of red cells in vivo, including autoimmune hemolytic anemia. Application of theory and problem-solving skills is emphasized. Prerequisites: CLS 500 (or concurrent enrollment). 4 hours.

*****CLS 531. Immunohematology Lab.** This course includes the study of red cell phenotyping, antibody detection and identification, pretransfusion testing, and laboratory investigation of hemolytic anemias. 1 hour.

*****CLS 532. Hematology II.** Structure and function of hematopoietic and lymphatic tissue. Stem cell differentiation, hematopoiesis, erythrocyte and leukocyte kinetics. Laboratory diagnosis and case management of anemia, lymphoma, myeloma, acute and chronic leukemia, myeloproliferative disorders, and myelodysplastic syndromes. Application of cell morphology, cell population scatter plots and histograms, cytochemistry, immunophenotyping, molecular methods, and cytogenetics. Hematology laboratory problem solving. 4 hours.

*****CLS 537. Infectious Diseases.** Pathogenic mechanisms of infectious diseases; normal flora and pathogens of various body sites; methods for collection, transport, and culturing different types of clinical specimens; interpretation of cultures. 3 hours.

*****CLS 538. Infectious Diseases Lab.** Performance and interpretation of direct gram stains; culturing various types of clinical specimens for isolation of bacteria; performing and interpreting tests used in the identification of potential pathogens; reporting culture results; antimicrobial susceptibility and resistance testing. 1 hour.

CLS 542. Molecular Diagnostics. Overview of nucleic acid structure, gene expression and genetic disease. Principle and performance of DNA and RNA isolation, amplification, hybridization, and analysis. Applications in microbiology, prenatal diagnosis, cancer management, transplantation, paternity testing, thrombosis risk testing and forensic medicine. 4 hours.

*****CLS 551. Clinical Chemistry I.** --Principles and methods of analysis of biochemical metabolites used in medical laboratories; problem solving; quality control and quality assurance. Metabolism of carbohydrates, proteins, heme, lipids and enzymes, and correlation of laboratory data. Case studies of common diseases and specimen problems. 3 hours.

*****CLS 552, Clinical Chemistry Lab.** Performance of techniques and tests used in a clinical chemistry lab to diagnose, treat and monitor human diseases. Application of quality control to commonly measured analytes. 1 hour.

****/***CLS 560. Clinical Correlations.** Correlate clinical, technical and analytical proficiencies that comprise clinical laboratory science practice. Analyze and interpret case studies through selection, application, and interpretation of clinical laboratory protocols. Prerequisites: CLS 518, 523, 528, 530, 537, 542 , 551 or concurrent enrollment. 3 hours.

****CLS 570. Professional Development.** Review of medical technology/ clinical laboratory science body of knowledge with required comprehensive trial certification final examination using self-directed online materials. Experience with the development of a personal certification maintenance plan to meet requirements defined by national certification agencies in Clinical Laboratory Sciences. 1 hour.

****CLS 595. Clinical Practice.** Directed clinical practice in immunohematology, Immunology, Hematology, Microbiology, and Chemistry; laboratory procedures and methods, problem-solving, quality assurance, preventive maintenance, and safety. Prerequisite: Admission to the CLS program. 1-12 hours.

CLS 610. Advanced Technology Assessment.--Analysis of technology assessment information for test methods and instruments utilized in diagnostic laboratory medicine services; experience with determining and evaluating performance characteristics and clinical utility information for specific diagnostic test procedures; application of quality management practices to establish the diagnostic accuracy of products sold and to establish process quality for services delivered; application of critical thinking skills to evaluate

methodological and substantive validity of correlation and evaluation studies relevant to laboratory medicine practices. Prerequisites: Biostatistics, CLS 693 or concurrent enrollment.

***CLS 686. Special Topics in Clinical Laboratory Sciences.**--Selected advanced topics of current scientific, clinical, and professional importance; specific topics designed to meet student need and interest. Prerequisite: Permission of Instructor. 1-4 hours.

CLS 693. Scientific Publications Analysis.--Review and scientific critique of current literature related to laboratory medicine, overview of research design and interpretation of statistics, sources of publication journals and government documents, content and style of scientific papers. Prerequisites: CDS 610.

*/****CLS 698. Master's Level Non-Thesis Research.**—Project completion. Prerequisite: Permission of Instructor. 1-6 hours.

*/****CLS 699. Master's Level Thesis Research.**--Implementation of research. Prerequisite: Permission of Instructor. 1-6 hours.

Cytology Courses

*** Courses may be repeated for credit with defined stipulations**
**** Courses not open to non-degree graduate students**
***** Upon Approval**

CT 501. Gynecologic Cytopathology. Study of the anatomy, physiology, histology, cytology and pathophysiology of the female genital tract and corresponding sellular manifestations which provide diagnostic information. Normal biologic variations, atypical changes, premalignancy, and types of malignancy are studied. Patient management and follow-up based on cytologic findings is addressed. 6 hours.

CT 521. Gynecologic Cytopathology Laboratory. Application of diagnostic criteria to develop practical analytical expertise to microscopically evaluate genecologic specimens with sufficient competence to issue the final report for a negative interpretation and prepare preliminary reports for all other cases, for review by the pathologist. Concurrent with CT 521. 6 hours.

CT 611. Non-Gynecologic Cytopathology. Study of the anatomy, histology, cytology and pathophysiology of the respiratory tract, body cavities, nervous system, gastrointestinal tract, urinary tract, and breast. The course will include fine needle aspiration cytology of these body sites and organs commonly sampled with a fine needle (thyroid, salivary glands, lymph nodes, liver, pancreas, kidney) as well as bone, soft tissue and other organs accessible by fine needle aspiration. 4 hours.

CT 624. Non-Gynecologic Laboratory. Application of diafnostic criteria to develop practical analytical expertise to microscopically evaluate cytologic specimens from all non-gynecologic body sites. Cell morphology, clinical history, and immunocytochemsitry will be used to differentiate between inflammatory, benign and malignant disease processes. Students will provide a differential diagnosis based on the synthesis of appropriate data. Concurrent with CT 611. Prerequisite: CT 521. 6 hours.

***CT 680. Gynecologic Cytology Practice**. Microscopic evaluation and interpretaiton of gynecologic class slide specimens in a clinical laboratory setting. Students will evaluate gynecologic specimens with sufficient competence to issue the final report for a negative interpretation and prepare preliminary reports for all other cases, for review by the pathologist. Prerequisite: CT 521. 1 hour.

CT 690. Professional Practice. Clinical internships in a variety of cytopathology laboratories. Students gain proficiency in evaluating and interpreting gynecologic and non-gynecologic specimens, and processing cytology specimens. Students participate in all phases of diagnostic service work and laboratory functions that may include continuing educaiton activities, adjunct diagnostic technologies and seminar attendance. Prerequisite: CT 680. 3-9 hours. Students must complete 9 hours of CT 690.

CT 693. Advanced Diagnostic Cytopathology. Students will have the opportunity to select and design a clinical experience to gain more knowledge and skills in a specific area. 2 hours.

CT 694. Clinical Molecular Pathology. Online course. Molecular basis of disease processes, analysis of current assays used in the clinical laboratory, impact on patient management, and ethical considerations. 2 hours.

CT 695. Certification Examination Review. Review of cytotechnology or molecular biology body of knowledge with required comprehensive trial certification finale examination. 1-3 hours. Prerequisite: CT 690 or permission of instructor; available for qualified non-degree seeking students desiring to prepare for the certification examinations.

CT 610. Research Design and Statistics. Introduction to clinical research methods and review of concepts involved in descriptive and inferential statistics. Topics covered include: overview of the research process, literature review, research hypothesis, research designs, sample selection, measurement methods, descriptive statistics, and inferential statistics. 3 hours.

CLS 500. Health and Safety Management. - Online course. Review of infection control principles focused on bloodborne, airborne, drug-resistant and opportunistic pathogens, and general health and safety guidelines and standards. Prerequisites: Open to all graduate students. 1 hour.

CLS 505. Laboratory Management. Roles and functions of clinical laboratories and practitioners; professionalism and ethics; educaitonal methodology and training; professional and interpersonal communicaiton; behavioral aspects of management; leadership styles and management theory; team-building; legal issues related to employment; recruitment, interview and selection of personnel; organizational culture and behavioral change; laboratory operations; safety, governmental regulations, standards and compliance; marketing, outreach, and business plan; budget, cost analysis, reimbursement; critical pathways, decision-making, test utilization; performance improvement, quality assessment; risk management, evidence-based laboratory medicine. 3 hours.

CLS 506. Laboratory Techniques. Overview of issues and skills surrounding working in the modern laboratory environment; includes safety, collection of specimens, equipment, mathematics, measurements, microscopy, dilutions, quality assurance, basic spectrophotometry, phlebotomy, automation of laboratory testing and lab computers. 2 hours.

CLS 542. Molecular Diagnostics. Overview of nucleic acid structure, gene expression and genetic disease. Principle and performance of DNA and RNA isolation, amplification, hybridization, and analyses. Applications in microbiology, prenatal diagnosis, cancer management, transplantation, paternity testing, thrombosis risk testing and forensic medicine. 2 hours.

CLS 543. Molecular Diagnostics Laboratory. Performance of molecular methods including, but not limited to nucleic acid isolation and purification, polymerase chain reaction, agarose gel electrophoresis, enzymatic manipulation of nucleic acids and metaphase chromosome spreads. 2 hour.

CLS 693. Scientific Publications Analysis.--Review and scientific critique of current literature related to laboratory medicine, overview of research design and interpretation of statistics, sources of publication journals and government documents, content and stule of scientific papers. Prerequisites: CDS 610.

***/**CLS 698. Master's Level Non-Thesis Research**.--Project completion. Prerequisite: Permission of Instructore. 1-6 hours.

Clinical Laboratory Sciences (M.S.)

Degree Offered:	M.S.
Directors:	Dr. Kathy Nugent (Biotechnology) Dr. Vivian Pijuan-Thompson (Cytology)

	Dr. Todd Casanova (Professional Entry
Phone:	(205) 934-7384 (Nugent) (205) 934-3378 (Pijuan-Thompson) (205) 934-1348 (Casanova)
Email:	knugent@uab.edu pijuan@uab.edu tcasanov@uab.edu
Web sites:	http://www.uab.edu/cds/academic/graduate/biotech (Biotechnology) http://www.uab.edu/cds/academic/graduate/ct (Cytology) http://www.uab.edu/cds/academic/graduate/cls (Professional Entry)

Faculty

Joanne Brock, Assistant Professor

Michelle Brown, Assistant Professor and Clinical Education Coordinator (CLS-PE); Body Fluids, Immunohematology

Todd Casanova, Associate Professor and Director (Interim; CLS-PE); Hematology, Hemostasis, Molecular Diagnostics

Janelle M. Chiasera, Professor and Acting Chair (Clinical Chemistry)

Joseph Garner, Assistant Professor

Pat Greenup, Associate Professor (CLS-PE); Laboratory Management, , Health and Safety, Instrumentation and Automation, Technology Assessments, Scientific Publications

Linda H. Jeff, Associate Professor (CLS-PE); Clinical Microbiology; Immunology, Educational Methodology, Clinical Correlations

Kathy Nugent, Assistant Professor

Vivian Pijuan-Thompson, Associate Professor

Tino Unlap, Associate Professor (Clinical and Diagnostic Sciences); Biotechnology; Recombinant DNA, Protein Chemistry

Program Information

Program Mission

The faculty members of the Clinical Laboratory Sciences Program (CLS) are devoted to providing an excellent service to the community and its graduate. The faculty, in its concern for the health and safety of the general public, is committed to ensuring that each student develops knowledge, skills, and values essential to the appropriate role providing the basis for continuing intellectual and professional growth.

Out of a great concern for applied technology and the role that it plays in the diagnosis, management and treatment of human disease, and in developing products to solve problems for present and future generations, the Program is designed to provide instruction through didactic and practical training in order to ensure that its graduates possess the critical knowledge and skill sets that are required for intellectual and professional growth in the future.

Programs

The Master of Science in Clinical Laboratory Sciences (M.S.) is pleased to offer three tracks for degree completion: Professional Entry, Biotechnology and Cytology.

Professional Entry

The Professional Entry track is designed for students who hold a Bachelor of Science in biology, chemistry, or a related major, and who are not certified medical technologists, but desire a career in clinical laboratory science. Such students, upon completion, will be eligible to take a national examination for certification as a Medical Technologist or Clinical Laboratory Scientist. The Professional Entry track requires 24 months as a full-time student for completion of the degree requirements.

Biotechnology

The Master of Science degree and certificate options in Biotechnology are designed to prepare a diverse student body for careers in various fields involving biotechnology and its related sciences. This program is designed to provide students with broad training and education in scientific principles and knowledge underlying biotechnology, scientific principles and knowledge underlying emerging diagnostic technologies associated with biotechnology, basic laboratory techniques in biotechnology, instrumentation and automation principles used in the biotechnology industry, and legal, regulatory and marketing issues in biotechnology.

The Biotechnology Program consists of a Master of Science option and a Graduate Certificate option that requiring 3 semesters for completion as full-time students. The Master of Science option requires 34

credit hours and is designed for individuals who hold a Bachelor of Science degree in a related discipline including biology, chemistry, biochemistry, physics, engineering, mathematics, psychology and sociology.

The Graduate Certificate option requires 20 credit hours and is designed for individuals who wish to obtain only a certificate in biotechnology (not an M.S. in CLS) in order to either find a position in the Biotech/Pharma Industry or to advance in their current position in the Biotech/Pharma or related industries.

Cytology

Graduates of the Cytology program receive a M.S. in Clinical Laboratory Sciences (MSCLS) with a certificate in Cytotechnology. Cytotechnologists work closely with pathologists to diagnose and manage infectious, pre-malignant, and malignant diseases by microscopically evaluating cells obtained from all body sites. Automated screening systems and new technologies are emerging and expanding the scope of practice for cytotechnologists. Our graduate program prepares students to provide the service expected of an entry level cytotechnologist by providing excellent didactic instruction and clinical experiences at numerous hospitals and private clinical laboratories. In addition, the program provides advanced clinical practice and didactic instruction in the performance and interpretation of ancillary diagnostic tests, new technologies used in clinical and research labs, applied research, and laboratory management. Graduates will be prepared to assume leadership positions in private and hospital laboratories, government and industrial facilities, and in academia. The program prepares graduates for a career that greatly benefits the practice of pathology and the patients it serves.

M.S. Admission Requirements

In addition to the general Graduate School admission requirements, applicants to the M.S. program must:

- have a biology, chemistry, or a related major from an accredited college or university if applying for the Professional Entry Program,
- have a minimum undergraduate GPA of 3.0 (A = 4.0), computed from all undergraduate credits or from the last 60 semester hours of undergraduate course credit,
- have scores of at least 500 in each of the verbal and quantitative sections of the GRE General Test,
- provide a written statement of career goals
- document a visit to a Cytology laboratory (Cytology track only)
- complete an interview with the program admissions committee (biotechnology and Cytology tracks)

If foreign-educated, have a score of at least 550 for paper version (or 80 for Internet version; or 213 for computer version) on the TOEFL, submit a transcript evaluation from World Education Services (WES) at **www.wes.org**

If accepted, students must complete the UAB medical history questionnaire and physical, provide proof of required immunizations, and receive satisfactory screening by the UAB Medical Center Student Health Service before enrollment.

Persons with a Bachelor of Science degree may be eligible to register for courses as non-degree seeking graduate students before acceptance into the M.S. program. If a non-degree seeking graduate student meets the M.S. program admission requirements, up to 12 semester hours of approved non-degree graduate coursework may be accepted for the M.S. degree. Admission of a student to any course as a non-degree student does not constitute admission to the M.S. degree program.

Essential Requirements

Fundamental tasks, behaviors, and abilities necessary to successfully complete the requirements of the Program are available upon request from the CLS program office. If you have a disability, but have not contacted Disability Support Services (DSS), please call 934-4205 or visit DSS at 516 Hill University Center or **http://students.uab.edu/dss**.

Additional Information:

Entry Term:	Fall semester
Deadline for All Application Materials to be in the Graduate School Office:	Six weeks before term begins
Number of Evaluation Forms Required:	None
Entrance Tests	GRE and for international applicants from non-English speaking countries, scores for the Test of English as a Foreign Language (TOEFL) and the Test of Written English(TWE)
Comments	Financial aid (fellowship, stipend or assistantship) is not available from the program; scholarship availability is limited; transcript evaluation by WES is required for applicants with

	foreign university degrees

Contact Information

For detailed information, contact the Department of Clinical and Diagnostic Sciences, Clinical Laboratory Sciences Program, UAB School of Health Professions, SHPB 430, 1705 University Blvd., Birmingham, Alabama 35294-1212.

Telephone 205-934-3209.

E-mail AskCDS@uab.edu

Course Descriptions

Clinical Laboratory Sciences (CLS)

Biotechnology Courses

*** Upon approval**

**** Required courses for certificate**

***** Upon Approval**

****CLS 500. Health and Safety Management. – Online Course.** Review of infection control principles focused on bloodborne, airborne, drug-resistant and opportunistic pathogens, and general health and safety guidelines and standards. Prerequisites: Open to all graduate students. 1 hour.

****CLS 506. Laboratory Techniques.** Overview of issues and skills surrounding working in the modern laboratory environment; includes safety, collection of specimens, equipment, mathematics, measurements, microscopy, dilutions, quality assurance, basic spectrophotometry, phlebotomy, automation of laboratory testing and lab computers. 2 hours.

****CLS 526. Instrumentation and Automation.** This course includes the study of the theory and principles of automation and instrumentation used in laboratories. An emphasis will be placed on quality control, quality assurance, instrumentation principles, basic statistics, and the regulatory, and economic issues encountered in laboratories including, clinical labs, health labs, government labs, private labs and other laboratories. 3 hours.

****CLS 527.Instrumentation and Automation Lab**. This course includes the practical application of automation and instrumentation used in laboratories. An emphasis will be placd on quality control, quality assurance, instrumentation principles, basic statistics, and the regulatory, and economic issues

encountered in laboratories including, clinical labs, health labs, government labs, private labs and other laboratories. 1 hour.

****CLS 542. Molecular Diagnostics**. Overview of nucleic acid structure, gene expression and genetic disease. Principle and performance of DNA and RNA isolation, amplification, hybridization, and analysis. Applications in microbiology, prenatal diagnosis, cancer management, transplantation, paternity testing, thrombosis risk testing and forensic medicine. 4 hours.

****/***CLS 545. Protein Chemistry.** This course focuses on applications of protein chemistry and examines the structure of proteins, their function, their binding to other molecules and the methodologies for the purification and characterization of proteins. 2 hours.

****/***CLS 555. Immunology.** Overview of the function of the innate defense mechanism, antigens, antibodies, development of the immune system, lymphocytes, immunoglobulins, lymphokines and inflammation. Includes discussion of advanced concepts of B-and T- lymphocyte ontogeny, generation and antibody diversity and genetics of the major histocompatibility complex, cytokine network and immunogenetics. 2 hours.

****CLS 637. Emerging Diagnostic Technologies.** This course covers emerging diagnostic technologies for use in clinical laboratories, including methods for molecular microbiology, oncology, hematology, genetics, and identity testing; flow cytometry, automation, and robotics. Review of rapid tests and new in vitro methodologies; economic factors; regulations and licensing issues; accreditation criteria; and social, ethical, and legal issues associated with emerging in vitro diagnostic technologies. Prerequisite: Permission of Instructor. 2 hours

CLS 640. Biotechnology Regulations and Quality Systems. This course provides an overview of regulatory and quality systems requirements for drugs, biologics, medical devices or combination products; includes guidance and compliance requirements with GXP (Good Laboratory/Clinical/Manufacturing Practices), Quality Systems Regulations, responsible conduct in human/animal research, inspection processes (FDA, ISO, CLIA), intellectual property and related ethical and legal issues such as dual use biodefense countermeasures development and distribution. 3 hours

****/***CLS 655. Recombinant DNA.** This course will cover the following general topics: DNA as the primary genetic material, information flow from DNA to protein, control of gene expression, basic tools for recombinant DNA, fundamental features of Eukaryotic genes, mobile DNA sequences in the genome, regulation of gene action by RNA interference, genome analysis, finding human disease genes, understanding the genetic basis for cancer, and DNA fingerprinting and forensics. 3 hours.

CLS 693. Scientific Publications Analysis. Review and scientific critique of current literature related to laboratory medicine, overview of research design and interpretation of statistics, sources of publication journals and government documents, content and style of scientific papers, writing of grant proposal and scientific poster presentation.3 hours

CLS 698. Master's Level Thesis/Non-Thesis Research. Completion of research paper that is based on an original research project. 4 hours

Professional Entry Courses

*** Courses may be repeated for credit with defined stipulations**
**** Courses not open to non-degree graduate students**
***** Upon Approval**

CLS 500. Health and Safety Management. – Online Course. Review of infection control principles focused on bloodborne, airborne, drug-resistant and opportunistic pathogens, and general health and safety guidelines and standards. Prerequisites: Open to all graduate students. 1 hour.

CLS 503. Body Fluids. Diagnosis and monitoring of renal and systemic disease through the physical, biochemical, and microscopic analysis of urine and feces. Diagnosis of central nervous system and systemic disease through cerebrospinal fluid analysis. Diagnosis of metabolic and infectious disease through analysis of peritoneal fluid, synovial fluid, transudates, and exudates. Fertility testing using semen analysis. 1 hour.

CLS 504. Body Fluids Laboratory. Diagnosis and monitoring renal and systemic disease through the physical, biochemical, and microscopic analysis of urine and feces. Diagnosis of central nervous system and systemic disease through cerebrospinal fluid analysis. Diagnosis of metabolic and infectious disease through analysis of peritoneal fluid, synovial fluid, transudates, and exudates. Fertility testing using semen analysis. 1 hour.

CLS 505. Laboratory Management. Roles and functions of clinical laboratories and practitioners; professionalism and ethics; educational methodology and training; professional and interpersonal communication; behavioral aspects of management; leadership styles and management theory; team-building; legal issues related to employment; recruitment, interview and selection of personnel; organizational culture and behavioral change; laboratory operations; safety, governmental regulations, standards and compliance; marketing, outreach, and business plan; budget, cost analysis, reimbursement; critical pathways, decision-making, test utilization; performance improvement, quality assessment; risk management, evidence-based laboratory medicine. 3 hours.

CLS 506. Laboratory Techniques. Overview of issues and skills surrounding working in the modern laboratory environment; includes safety, collection of specimens, equipment, mathematics, measurements, microscopy, dilutions, quality assurance, basic spectrophotometry, phlebotomy, automation of laboratory testing and lab computers. 2 hours.

CLS 518. Immunology. --Physiology of immune responses to infectious agents, tumors, transplants; abnormal responses: hypersensitivity, autoimmunity, immunoproliferative disorders, and immunodeficiencies; antigen-antibody reactions; complement; applications of immunology tests. 4 hours.

CLS 519. Immunology Lab. Specimen requirements, principle, procedure, clinical significance, and sources of error of common clinical immunology tests; performance and interpretation of tests; application of results to clinical situations. 1 hour.

CLS 523. Clinical Microbiology. Reservoirs, modes of transmission, disease associations, and morphological and biochemical characteristics of microorganisms commonly isolated in the clinical laboratory; methods used to isolate and identify bacteria, parasites, and fungi 3 hours.

CLS 524. Clinical Microbiology Lab. Performance of techniques and tests used in the isolation and identification of bacteria, fungi, and parasites commonly seen in a clinical microbiology laboratory. 1 hour.

CLS 526. Instrumentation and Automation. This course includes the study of the theory and principles of automation and instrumentation used in laboratories. An emphasis will be placed on quality control, quality assurance, instrumentation principles, basic statistics, and the regulatory, and economic issues encountered in laboratories including, clinical labs, health labs, government labs, private labs and other laboratories. 3 hours.

CLS 527. Instrumentation and Automation Lab. This course includes the practical application of automation and instrumentation used in laboratories. An emphasis will be placed on quality control, quality assurance, instrumentation principles, basic statistics, and the regulatory, and economic issues encountered in laboratories including, clinical labs, health labs, government labs, private labs and other laboratories. 1 hour.

CLS 528. Hematology I.--Systematic examination of blood cells: normal function; recognizing their microscopic appearance; blood cell disorders; standard and special clinical hematology laboratory procedures; validation of laboratory data; interpretation of results, quality assurance. 4 hours.

*****CLS 530. Immunohematology.** This course covers blood group antigen-antibody reactions; donor blood collection and testing; serological characteristics and immunogenetics of the major blood group systems; pretransfusion testing, basic and advanced techniques of antibody identification and problem-solving; transfusion therapy; laboratory evaluation of hemolytic disease of the newborn; and the investigation of immune coating of red cells in vivo, including autoimmune hemolytic anemia. Application of theory and problem-solving skills is emphasized. Prerequisites: CLS 500 (or concurrent enrollment). 4 hours.

*****CLS 531. Immunohematology Lab.** This course includes the study of red cell phenotyping, antibody detection and identification, pretransfusion testing, and laboratory investigation of hemolytic anemias. 1 hour.

*****CLS 532. Hematology II.** Structure and function of hematopoietic and lymphatic tissue. Stem cell differentiation, hematopoiesis, erythrocyte and leukocyte kinetics. Laboratory diagnosis and case management of anemia, lymphoma, myeloma, acute and chronic leukemia, myeloproliferative disorders, and myelodysplastic syndromes. Application of cell morphology, cell population scatter plots and histograms, cytochemistry, immunophenotyping, molecular methods, and cytogenetics. Hematology laboratory problem solving. 4 hours.

*****CLS 537. Infectious Diseases.** Pathogenic mechanisms of infectious diseases; normal flora and pathogens of various body sites; methods for collection, transport, and culturing different types of clinical specimens; interpretation of cultures. 3 hours.

*****CLS 538. Infectious Diseases Lab.** Performance and interpretation of direct gram stains; culturing various types of clinical specimens for isolation of bacteria; performing and interpreting tests used in the identification of potential pathogens; reporting culture results; antimicrobial susceptibility and resistance testing. 1 hour.

CLS 542. Molecular Diagnostics. Overview of nucleic acid structure, gene expression and genetic disease. Principle and performance of DNA and RNA isolation, amplification, hybridization, and analysis. Applications in microbiology, prenatal diagnosis, cancer management, transplantation, paternity testing, thrombosis risk testing and forensic medicine. 4 hours.

*****CLS 551. Clinical Chemistry I.** --Principles and methods of analysis of biochemical metabolites used in medical laboratories; problem solving; quality control and quality assurance. Metabolism of carbohydrates, proteins, heme, lipids and enzymes, and correlation of laboratory data. Case studies of common diseases and specimen problems. 3 hours.

*****CLS 552, Clinical Chemistry Lab.** Performance of techniques and tests used in a clinical chemistry lab to diagnose, treat and monitor human diseases. Application of quality control to commonly measured analytes. 1 hour.

****/***CLS 560. Clinical Correlations.** Correlate clinical, technical and analytical proficiencies that comprise clinical laboratory science practice. Analyze and interpret case studies through selection, application, and interpretation of clinical laboratory protocols. Prerequisites: CLS 518, 523, 528, 530, 537, 542 , 551 or concurrent enrollment. 3 hours.

****CLS 570. Professional Development.** Review of medical technology/ clinical laboratory science body of knowledge with required comprehensive trial certification final examination using self-directed online materials. Experience with the development of a personal certification maintenance plan to meet requirements defined by national certification agencies in Clinical Laboratory Sciences. 1 hour.

****CLS 595. Clinical Practice.** Directed clinical practice in immunohematology, Immunology, Hematology, Microbiology, and Chemistry; laboratory procedures and methods, problem-solving, quality assurance, preventive maintenance, and safety. Prerequisite: Admission to the CLS program. 1-12 hours.

CLS 610. Advanced Technology Assessment.--Analysis of technology assessment information for test methods and instruments utilized in diagnostic laboratory medicine services; experience with determining and evaluating performance characteristics and clinical utility information for specific diagnostic test procedures; application of quality management practices to establish the diagnostic accuracy of products sold and to establish process quality for services delivered; application of critical thinking skills to evaluate methodological and substantive validity of correlation and evaluation studies relevant to laboratory medicine practices. Prerequisites: Biostatistics, CLS 693 or concurrent enrollment.

***CLS 686. Special Topics in Clinical Laboratory Sciences.**--Selected advanced topics of current scientific, clinical, and professional importance; specific topics designed to meet student need and interest. Prerequisite: Permission of Instructor. 1-4 hours.

CLS 693. Scientific Publications Analysis.--Review and scientific critique of current literature related to laboratory medicine, overview of research design and interpretation of statistics, sources of publication journals and government documents, content and style of scientific papers. Prerequisites: CDS 610.

*/****CLS 698. Master's Level Non-Thesis Research.**—Project completion. Prerequisite: Permission of Instructor. 1-6 hours.

*/****CLS 699. Master's Level Thesis Research.**--Implementation of research. Prerequisite: Permission of Instructor. 1-6 hours.

Cytology Courses

*** Courses may be repeated for credit with defined stipulations**
**** Courses not open to non-degree graduate students**
***** Upon Approval**

CT 501. Gynecologic Cytopathology. Study of the anatomy, physiology, histology, cytology and pathophysiology of the female genital tract and corresponding sellular manifestations which provide diagnostic information. Normal biologic variations, atypical changes, premalignancy, and types of malignancy are studied. Patient management and follow-up based on cytologic findings is addressed. 6 hours.

CT 521. Gynecologic Cytopathology Laboratory. Application of diagnostic criteria to develop practical analytical expertise to microscopically evaluate genecologic specimens with sufficient competence to issue the final report for a negative interpretation and prepare preliminary reports for all other cases, for review by the pathologist. Concurrent with CT 521. 6 hours.

CT 611. Non-Gynecologic Cytopathology. Study of the anatomy, histology, cytology and pathophysiology of the respiratory tract, body cavities, nervous system, gastrointestinal tract, urinary tract, and breast. The course will include fine needle aspiration cytology of these body sites and organs commonly sampled with a fine needle (thyroid, salivary glands, lymph nodes, liver, pancreas, kidney) as well as bone, soft tissue and other organs accessible by fine needle aspiration. 4 hours.

CT 624. Non-Gynecologic Laboratory. Application of diafnostic criteria to develop practical analytical expertise to microscopically evaluate cytologic specimens from all non-gynecologic body sites. Cell morphology, clinical history, and immunocytochemsitry will be used to differentiate between inflammatory, benign and malignant disease processes. Students will provide a differential diagnosis based on the synthesis of appropriate data. Concurrent with CT 611. Prerequisite: CT 521. 6 hours.

***CT 680. Gynecologic Cytology Practice**. Microscopic evaluation and interpretaiton of gynecologic class slide specimens in a clinical laboratory setting. Students will evaluate gynecologic specimens with sufficient competence to issue the final report for a negative interpretation and prepare preliminary reports for all other cases, for review by the pathologist. Prerequisite: CT 521. 1 hour.

CT 690. Professional Practice. Clinical internships in a variety of cytopathology laboratories. Students gain proficiency in evaluating and interpreting gynecologic and non-gynecologic specimens, and processing cytology specimens. Students participate in all phases of diagnostic service work and

laboratory functions that may include continuing educaiton activities, adjunct diagnostic technologies and seminar attendance. Prerequisite: CT 680. 3-9 hours. Students must complete 9 hours of CT 690.

CT 693. Advanced Diagnostic Cytopathology. Students will have the opportunity to select and design a clinical experience to gain more knowledge and skills in a specific area. 2 hours.

CT 694. Clinical Molecular Pathology. Online course. Molecular basis of disease processes, analysis of current assays used in the clinical laboratory, impact on patient management, and ethical considerations. 2 hours.

CT 695. Certification Examination Review. Review of cytotechnology or molecular biology body of knowledge with required comprehensive trial certification finale examination. 1-3 hours. Prerequisite: CT 690 or permission of instructor; available for qualified non-degree seeking students desiring to prepare for the certification examinations.

CT 610. Research Design and Statistics. Introduction to clinical research methods and review of concepts involved in descriptive and inferential statistics. Topics covered include: overview of the research process, literature review, research hypothesis, research designs, sample selection, measurement methods, descriptive statistics, and inferential statistics. 3 hours.

CLS 500. Health and Safety Management. - Online course. Review of infection control principles focused on bloodborne, airborne, drug-resistant and opportunistic pathogens, and general health and safety guidelines and standards. Prerequisites: Open to all graduate students. 1 hour.

CLS 505. Laboratory Management. Roles and functions of clinical laboratories and practitioners; professionalism and ethics; educaitonal methodology and training; professional and interpersonal communicaiton; behavioral aspects of management; leadership styles and management theory; team-building; legal issues related to employment; recruitment, interview and selection of personnel; organizational culture and behavioral change; laboratory operations; safety, governmental regulations, standards and compliance; marketing, outreach, and business plan; budget, cost analysis, reimbursement; critical pathways, decision-making, test utilization; performance improvement, quality assessment; risk management, evidence-based laboratory medicine. 3 hours.

CLS 506. Laboratory Techniques. Overview of issues and skills surrounding working in the modern laboratory environment; includes safety, collection of specimens, equipment, mathematics, measurements, microscopy, dilutions, quality assurance, basic spectrophotometry, phlebotomy, automation of laboratory testing and lab computers. 2 hours.

CLS 542. Molecular Diagnostics. Overview of nucleic acid structure, gene expression and genetic disease. Principle and performance of DNA and RNA isolation, amplification, hybridization, and analyses. Applications in microbiology, prenatal diagnosis, cancer management, transplantation, paternity testing, thrombosis risk testing and forensic medicine. 2 hours.

CLS 543. Molecular Diagnostics Laboratory. Performance of molecular methods including, but not limited to nucleic acid isolation and purification, polymerase chain reaction, agarose gel electrophoresis, enzymatic manipulation of nucleic acids and metaphase chromosome spreads. 2 hour.

CLS 693. Scientific Publications Analysis.--Review and scientific critique of current literature related to laboratory medicine, overview of research design and interpretation of statistics, sources of publication journals and government documents, content and stule of scientific papers. Prerequisites: CDS 610.

/*CLS 698. Master's Level Non-Thesis Research**.--Project completion. Prerequisite: Permission of Instructor. 1-6 hours.

Genetic Counseling (M.S.)

Degree Offered: M.S.

Director: R Lynn Holt, M.S, C.G.C.

Phone: (205) 975-2922

E-mail: LynnHolt@uab.edu

Web site: www.uab.edu/msgc

Faculty

R. Lynn Holt, **MS, CGC**

Program Director and Assistant Professor

Maria Descartes, **MD**

Medical Director and Associate Professor of Genetics

Christina B. Hurst, MS, CGC

Assistant Program Director and Assistant Professor

M.S. Program in Genetic Counseling

Accreditation:

The Genetic Counseling Program is provisionally accredited by The American Board of Genetic Counseling, Inc. (ABGC) as a new program. The program is eligible for full accreditation in 2013. All students that graduate from a provisionally accredited program have the same rights and privileges as graduates from a fully accredited program to apply for certification and licensure as a genetic counselor. In the event that a program does not receive full accreditation, all students that graduate from the program while provisionally accredited are still board eligible.

Admission Requirements

- Baccalaureate degree from a regionally-accredited college/university
- Graduate Record Examination (GRE) General Test scores from the Verbal, Quantitative and Analytic sections. Applicants with advanced degrees whose GRE scores are older than 5 years (the time limit that ETS will send scores) can send reports from previously attended graduate programs.
- A minimum cumulative undergraduate grade point average of at least 3.0 (A = 4.0)
- A minimum GPA of 3.0 in natural science courses
- A minimum cumulative grade point average of 3.0 in the program prerequisite courses, with a minimum grade of C in each (prerequisite courses are listed below)
- Resume or CV: This should include academic qualifications, a description and timeline of any paid or volunteer work experience in crisis counseling or peer counseling setting, working with individuals with genetic conditions or disabilities, technical work in laboratories, or teaching experience and any other relevant information.
- A personal statement (no more than 500 words) highlighting your motivation to become a genetic counselor, and emphasizing your prior and current experiences and how they will benefit you in the profession.
- Paid or volunteer experience in a crisis counseling setting, peer counseling setting, working with individuals with genetic conditions or disabilities, technical work in genetics laboratories, or teaching experience in biology or genetics are recommended and encouraged in preparation for entering the genetic counseling field.
- Interview with faculty
- Three letters of recommendation
- Satisfactory screening on health data questionnaire by the UAB Medical Center Student Health Service.
- The following course prerequisites:
  - 4 semester hours of biology I (with lab)
  - 4 semester hours of biology II (with lab)
  - 3-4 semester hours of biochemistry

- 3-4 semester hours of genetics
- 3 semester hours of statistics (upper level, population, and/or health-related)
- 3-4 semester hours of psychology (general, developmental, or abnormal)

Degree Requirements

The graduate program in genetic counseling will follow the Plan II (non-thesis) option.

Program Curriculum

Fall Semester, 1st year

GC 501 Genetics in Medicine (3)

GC 510 Introduction to Genetic Counseling (3)

GC 560 Genetic Counseling Journal Club (1)

GC 725/ Advanced Medical Genetics (3)

CDS 610 Research Design and Statistics (3)

ECG 621 Theories in Counseling (3)

Spring Semester, 1st year

GC 504 Prenatal Genetics, Embryology, and Teratology (3)

GC 505 Principles of Cancer and Adult Genetics and Counseling (3)

GC 506 Theory and Practice of Genetic Counseling (3)

GC 560 Genetic Counseling Journal Club (1)

CDS 625 Scientific Publications (3)

ECG 628 Counseling Skills and Techniques (3)

Summer Semester

GC 650 Clinical Laboratory Rotation (2)

GC 651 Clinical Rotation I (5)

Fall Semester, 2nd year

GC 600 Advanced Clinical Skills in Genetic Counseling (2)

GC 652 Clinical Rotation II (2)

GC 653 Clinical Rotation III (2)

GC 560 Genetic Counseling Journal Club (1)

GC 698 Non-thesis Research (2)

CDS 500 Phlebotomy and Body Fluid Collection (1)

Spring Semester, 2nd year

GC 602 Advanced Topics in Genetic Counseling (3)

GC 654 Clinical Rotation IV (2)

GC 655 Clinical Rotation V (2)

GC 560 Genetic Counseling Journal Club (1)

GC 698 Non-thesis Research (2)

CDS 604 Survival Spanish for Health Professionals (1)

Additional Information

Deadline for Entry Term(s):	January 15
Deadline for All Application Materials to be in the Graduate School Office:	January 15
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)

For detailed information, contact Program Director, Graduate Program in Genetic Counseling, UAB School of Health Professions, 1705 University Boulevard, SHPB 441, Birmingham, AL 35294-1212.

Telephone 205-975-4CDS (205-975-4237)

E-mail AskCDS@uab.edu

Website www.uab.edu/msgc

Course Descriptions

Genetic Counseling (GC)

GC 501. Genetics in Medicine (3 hrs)

An overview of the clinical evaluation and assessment of an individual with a congenital anomaly, mental retardation and/or genetic condition. This will include the introduction to the etiology of common genetic conditions, and testing and treatment options for genetic disorders.

GC 504. Prenatal Genetics, Embryology, and Teratology (3 hrs)

Overview of embryology, teratology and physiology as related to human development and genetic disease and their applications in prenatal genetic counseling.

GC 505. Principles of Cancer and Adult Genetics and Counseling (3 hrs)

Genetic mechanisms of genetic cancer syndromes, cancer predisposition, and adult onset disorders as well as the psychosocial issues related to these conditions that influence the genetic counseling process.

GC 506. Theory and Practice of Genetic Counseling (3 hrs)

Advanced genetic counseling skills as preparation to enter clinical settings.

GC 510. Introduction to Genetic Counseling (3 hrs)

Introduction to the field of genetic counseling and the basic principles of the profession.

GC 560. Genetic Counseling Journal Club. (1 hr)

Review, presentation and discussion of relevant literature in medical genetics and genetic counseling.

GC 698. Non-thesis Research. (2 hrs)

Graduate level research project under the supervision of clinical faculty.

GC 600 Advanced Clinical Skills in Genetic Counseling (2 hrs)

This course provides students with advanced genetic counseling clinical skills in areas such as communication, research, industry and reflective practice.

GC 602. Advanced Topics in Genetic Counseling (3 hrs)

Exploration of advanced topics in the field of genetic counseling that related to clinical practice and non-clinical professional duties as a genetic counselor.

GC 725 Advanced Medical Genetics (3 hrs)

This course focuses on the medical application of advances in genetics and genomics. Topics will include chromosome structure and function and major types of chromosomal abnormalities, cancer genetics and cytogenetics, inborn errors of metabolism, current strategies for detection of mutations associated with genetic disorders, genetic risk assessment and population genetics, and genomic approaches to diagnosis and risk stratification.

Rotation Coursework

GC 650 Clinical Laboratory Rotation (2 hrs)

This lab rotation will provide students with information about clinical laboratory methods and protocols, testing procedures and specimen management, and other related topics.

GC 651. Clinical Rotation I (5 hrs)

Initial clinical rotation for students to establish basic skill set in genetic counseling applications. Students will interact with an array of genetic specialists in a clinical setting. Supervised and direct patient contact in prenatal, pediatric, adult, cancer and specialty clinics will allow students to acquire cases for ABGC certification.

GC 652. Clinical Rotation II (2 hrs)

Students utilized intermediate clinical skills in assigned clinical setting. Students will interact with an array of genetic specialists in a clinical setting. Supervised and direct patient contact in prenatal, pediatric, adult, cancer and specialty clinics will allow students to acquire cases for ABGC certification.

GC 653. Clinical Rotation III (2 hrs)

Students will apply progressive genetic counseling skills in clinical setting. Students will interact with an array of genetic specialists in a clinical setting. Supervised and direct patient contact in prenatal, pediatric, adult, cancer and specialty clinics will allow students to acquire cases for ABGC certification.

GC 654. Clinical Rotation IV (2 hrs)

Students will demonstrate advanced clinical genetic counseling skills. Students will interact with an array of genetic specialists in a clinical setting. Supervised and direct patient contact in prenatal, pediatric, adult, cancer and specialty clinics will allow students to acquire cases for ABGC certification.

GC 655. Clinical Rotation V (2 hrs)

Advanced clinical rotation to allow student additional exposure in area of interest. Students will interact with an array of genetic specialists in a clinical setting. Supervised and direct patient contact in prenatal, pediatric, adult, cancer and specialty clinics will allow students to acquire cases for ABGC certification.

Required courses taught through other departments and schools

CDS 500 Phlebotomy and Body Fluid Collection

CDS 604 Survival Spanish for Health Professionals

CDS 610 Research Design and Statistics

CDS 625 Scientific Publications

ECG 621 Theories in Counseling

ECG 628 Counseling Skills and Techniques

Health Administration (M.S.H.A.)

Residential and Executive M.S.H.A.

Director:	Dr. Jeffrey Burkhardt (Residential & Executive)
Phone:	(205) 934-1670

E-mail: jburkhar@uab.edu

Web site: www.uab.edu/msha

Primary Faculty

Darrell Burke, Associate Professor (Health Services Administration); Operations Management, Health Informatics; Quality Improvement; Quantitative Methods; IT Management

Eta Berner, Professor (Health Services Administration); Health Informatics

Jeffrey Burkhardt, Professor (Health Services Administration); Health Care Finance

Gerald Glandon, Professor and Chair (Health Services Administration); Economics and Cost Effectiveness

Randa S. Hall, Instructor (Health Services Administration); Medical Practice Management

Denise Hamilton, Instructor (Health Services Administration): Health Care Finance

S. Robert Hernandez, Professor (Health Services Administration); Health Services Administration, Organization Theory, Organizational Assessment, Health Planning

Tee H. Hiett, Professor Emeritus (Health Services Administration); Quantitative Methods, Information Systems, Teaching Methods

Howard W. Houser, Professor Emeritus (Health Services Administration); Health Services Administration, International Health, Public Policy

Amy Y. Landry, Assistant Professor (Health Services Administration); Leadership, Strategic Management of Healthcare Organizations, Management Training and Development

Stephen J. O'Connor, Professor (Health Services Administration); Governing Boards, Medical Staff Relations, Organization Behavior, Human Resources Management

M. Paige Powell, Assistant Professor (Health Services Administration); Health Policy, Health Care Ethics

Jose B. Quintana, Assistant Professor (Health Services Administration); Outcomes in Production of Health and Process Improvement

Midge N. Ray, Associate Professor (Health Services Administration); Health information management

Richard M. Shewchuk, Professor (Health Services Administration); Health Issues in Aging, Quantitative Methods

Jerry (Mickey) Trimm, Associate Professor (Health Services Administration); Operations Management, Quality Improvement, Rural Health

Robert Weech-Maldonado, Professor and L. R. Jordan Endowed Chair (Health Services Administration): Health Disparities, Health Services Research, Long-term Care, Patient Satisfaction

Secondary Faculty

Becker, Cybulsky, DeMoss, Ferniany, Fos, Ginter, Kennedy, McGwin, Menachemi, Morrisey, Phillips, Powers, Ransburg-Brown, Sen, Smith, Van Matre, Wheeler.

Program Information

The Master of Science in Health Administration (M.S.H.A.) Program, accredited by the Commission on Accreditation of Healthcare Management Education, trains executives for health services organizations. The program has graduated more than 1,300 persons since 1965.

Students must complete 22 graduate courses while on campus and a 12-month administrative residency in a health care organization. A capstone core course is completed during the last on-campus semester. Twenty-two core courses and two elective courses are required as well as a summer internship or international experience for single MSHA students. All students begin in the fall term and complete coursework in 21 months followed by the administrative residency.

Complete applications for fall entry are due no later than the preceding March 1. Since admission to the M.S.H.A. program is very competitive, early application is encouraged.

M.S.H.A.-M.B.A., M.S.H.A.-M.S.H.I. Coordinated Degrees

Students wishing to pursue simultaneously the Master of Science in Health Administration (M.S.H.A.) and the Master of Business Administration (M.B.A.) degrees must complete 29 graduate courses, including 4 electives. Students seeking to complete the Master of Science in Health Administration (M.S.H.A.) and the Master of Science in Health Informatics (M.S.H.I.) must complete 29 graduate courses. A 12-month administrative residency in a health services organization is required for completion of the M.S.H.A. program. A student who enters a coordinated program, but subsequently decides to pursue only one of the degrees, must satisfy all the requirements for the degree sought.

Application Information

Applicants to the M.S.H.A., M.S.H.A.-M.B.A, or M.S.H.A.-M.S.H.I. programs must have completed or anticipate completion of at least a baccalaureate degree from a regionally accredited college or university or from a recognized university abroad before entry into the program. Prior to matriculation, students must have completed 6 semester hours of undergraduate accounting with a grade of B or better. In addition, M.S.H.A.-M.B.A. students must have successfully completed three semester credit hours in calculus.

Application for the M.S.H.A. program should be made using the UAB Graduate School Apply Yourself Application Network Service available at (http://app.applyyourself.com/?id=uab-grad).

Telephone 205-934-1583

E-mail parmstrong@uab.edu

Web **www.uab.edu/msha**

Additional Information

Deadline for Entry Term(s):	Fall
Deadline for All Application Materials to be in the Graduate School Office:	March 1 for first priority and June 1 if space is still available
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE or GMAT is required for Residential applicants only. TOEFL and TWE are also required for all international applicants whose native language is not English.
Comments	Additional application for admission is required by program
Graduate Catalog Description	http://main.uab.edu/Sites/gradschool/programs/72009/

For detailed information, contact Admissions Coordinator, Department of Health Services Administration, UAB School of Health Professions, Webb 506, 1530 3rd Avenue South, Birmingham, AL 35294-3361.

Telephone 205-934-1583

E-mail **parmstrong@uab.edu**

Web **www.uab.edu/msha**

or the UAB Graduate School of Management (MBA Program), BEC 203, 1530 3rd Avenue South, Birmingham, Alabama 35294-4460.

Telephone 205-934-8815

E-mail **cmanning@uab.edu**

Web **www.business.uab.edu**

Executive M.S.H.A. Program

Qualified students can earn the Master of Science in Health Administration (M.S.H.A.) by completing the executive program. This program is open to those with at least 5 years of experience in health care organizations, either as managers or as clinical professionals. Participants in the Executive M.S.H.A. program complete both on-campus and distance-learning activities, and a brief field experience, within 2 years of study.

Additional Information

For detailed information, contact Admissions Coordinator, Department of Health Services Administration, UAB School of Health Professions, Webb 605, 1530 3rd Avenue South, Birmingham, Alabama 35294-3361.

Telephone 205-934-1672

E-mail **sarap@uab.edu**

Web **www.uab.edu/msha** **(Click on Executive M.S.H.A.)**

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

Health Administration (HA)

602. **Introduction to Health Care Systems**. U.S. health care system. Historical context; systems theory; analysis of organizational components; health services personnel; national, state, and local government roles; financing mechanisms; demography; mortality and morbidity; quality assurance; political issues; and trends in progress. Individual and group projects and field trips (4-credit hours).

605. **Health Policy and Politics in the United States**. Policy-making process in the U.S. Review of forces influencing policy-making, legislative process, and evolution of U.S. health policy.

606. **Operations Management and Process Improvement in Health Services Administration.** Overview of operational management processes from the administrative perspective. Provides students with knowledge, skills, and tools necessary to implement, facilitate, and coordinate continuous quality improvement activities in health care environments.

607. **Operations Management in Health Services Administration**. Overview of operational management processes from the administrative perspective. **Executive MSHA Only**

612. **Essentials of Health and Human Disease**. Essentials of health and human disease related to normal and abnormal physiology.

613. **Health Law**. Selected legal principles and their application to health field. Legal aspects of corporate liability, medical malpractice, admission and discharge processes, medical staff bylaws, informed consent, nursing, patients' rights, medical records, and governmental regulation of personnel and health facilities.

614. **Process Improvement**. Customer-driven process involving team and process thinking and application of statistical tools to way in which work is accomplished. Provides knowledge, skills, and tools necessary to implement, facilitate, and coordinate continuous quality improvement activities in health care environments. **Executive MSHA Only**

616. **Medical Aspects of Emergency and Disaster Management. Biomedical Ethics.** Focuses on the examination of various faith traditions, theories, principles and methods that influence reasoning, analysis, and argument in contemporary health care ethics. Investigation of notable cases, the application of Modern Moral Theory, and in depth discourse on current issues in health care ethics (including media) is the cornerstone of the course.

618. **Seminar in Health Services Administration**. The purpose of this seminar is to meet MSHA students' needs for exposure to issues and processes beyond the traditional didactic component of the curriculum by providing additional exposure to executives and other leaders in health care. It provides an opportunity to reinforce skills, knowledge, and abilities that will be required if students are to effectively transition into their administrative residency and professional health management practice (1-credit hour).

620. **Health Care Financial Management I.** This course will concentrate on the application of accounting and financial management principles and concepts for decision-making in health care organizations, and

will integrate knowledge of these principles to specific problems. Five topics are covered: financial accounting, cost accounting, sources of revenues, budgeting and control, and pricing.

621. **Health Care Financial Management II**. This course will concentrate on the application of financial management principles and concepts for decision-making in health care organizations, and will integrate knowledge of health care finance to specific problems.

Topics covered include time value of money, investment decision analysis, investment and portfolio risk, cost of capital, risk and return, capital budgeting, and analysis and development of pro forma financial statements. Much of the learning in this course will come from case analyses, interactions with other students, and participation in the classroom discussions.

623. **Application of Health Care Finance Concepts**. Designed to be a "hands-on" project with an area health care oriented Chief Financial Officer that would be a "real world" application of financial tools and techniques for students.

624. **Revenue Cycle Management**. This course allows students to understand the impact and process related to the revenue cycle and how it is integrated into the operations of a health care organization.

625. **Strategic Planning and Management**. Methods for strategic planning and management of health services organizations. Techniques for determining strategies for unique services; integration of strategy, structure, and administrative systems.

628**. Leadership Development**. Provides tools for the students' professional development and leadership; directs students' search for an administrative residency.

631. **Organization Theory and Behavior**. Introduction to organization theory and behavior with applications to health services organizations. Topics include organization structure, organizational/environmental relationships, organizational performance, power and leadership, attitudes, motivation, communication, and group dynamics.

632. **Quantitative Methods in Health Services Administration**. Selected mathematical, statistical, and computer applications and statistical techniques applied to decision making in hospitals and health services organizations.

635. **Human Resources Management in Health Services Administration**. Human resources management issues, including strategic role of employee selection, appraisal, rewards, and development, applications to health care sector, labor relations, and unique aspects of labor law relevant to health care organizations.

640. **Information Systems and Management Science in Health Services Administration**. Effective use of information and quantitative analysis in clinical care and management decision making in health services organizations. Provides students with sufficient background to communicate effectively with technical personnel and provide general management oversight of information systems within organizations.

644. **Seminar: Issues in Ambulatory Care and Medical Group Management**. Overview to the field of ambulatory care and physician practice management. Emphasis on outpatient care.

645. **Health Economics**. Economic analysis applied to health services sector; concepts of efficiency applied to production and distribution of health services, health insurance, government programs, health care personnel and health services organizations; current public policy issues; emphasis on student application of economic principles to health care issues.

671. **Health Care Marketing**. Introductory survey of marketing concepts as applied to health services organizations. Consumer behavior, market segmentation, target marketing, marketing research, management, and control of marketing mix variables. (Also MBA 671).

672. **Health Care Entrepreneurship**. Overview of the principle components of health care entrepreneurship, including business planning, raising funds, and the entrepreneurial process. Special attention will be given to developing entrepreneurial activity and promoting innovation in existing health care organizations (intrapreneurial ventures).

675. **Health Administration Internship**. Provides an experience for MSHA students to become more familiar with a health care organization or the delivery of health care in a different country.

680. **Health Administration Capstone**. Integrate concepts and methods covered within the MSHA curriculum, application of concepts, principles, and theories that will generate solutions and recommendations for the case study.

690. **Administrative Residency**. Students enroll in this course during their administrative residency.

Graduate Certificate in Health Focused Patient/Client Management for Physical and Occupational Therapists

Contact Information

Program Coordinator: Cecilia Graham, PT, PhD

Email: cgraham@uab.edu

Phone: 205-934-5949
Fax: 205-975-7787
Web site: www.uab.edu/ptotcert
Mailing address:
The University of Alabama at Birmingham
Department of Physical Therapy
1720 2nd Avenue South
SHPB 337
Birmingham, AL 35294-1212

Program Information

The UAB Graduate Certificate in Health Focused Patient/Client Management for Physical and Occupational Therapists is designed to prepare PTs and OTs for expanding roles in the areas of prevention, health promotion, and wellness. Health Focused Patient/Client Management is the integration of health promotion and education methods in OT and PT practice to create a holistic approach to enhance patient/client wellness and quality of life. The ultimate goal of the certificate is to enable graduates to develop and implement clinical and community programs to address lifestyle and behavior factors that underlie many chronic diseases. Emphasis will be placed on program development for persons with disabilities. The concepts addressed in the certificate program are applicable across the patient/client lifespan and in a variety of practice settings.

Credentials Conferred

The Graduate Certificate in Health Focused Patient/Client Management for Physical and Occupational Therapists awarded by the University of Alabama at Birmingham.

Length of Study

The certificate requires 5 semesters to complete; students take 1 course per semester.

Program Entrance Date

A new cohort of students is admitted in January of each year.

Program Faculty

Diane Clark, PT, DScPT, MBA, Assistant Professor of Physical Therapy
Kathleen Foley, PhD, OTR/L, Assistant Professor of Occupational Therapy
Cecilia Graham, PT, PhD, Associate Professor of Physical Therapy
Elizabeth Kitchin, PhD, RD, Assistant Professor of Nutrition Sciences

Donald Lein, PT, PhD, Assistant Professor of Physical Therapy
John McCarthy, PT, PhD, Associate Professor of Physical Therapy
David Morris, PT, PhD, Associate Professor of Physical Therapy
Mary Warren, PhD, OTR/L, SCLV, FAOTA, Associate Professor of Occupational Therapy
Laura Vogtle, PhD, OTR/L, FAOTA, Associate Professor of Occupational Therapy

Admission Requirements

Admissions requirements include completion of a degree in physical or occupational therapy and current licensure as a physical or occupational therapist in the United States or foreign equivalent. Students from countries where English is not the official and primary language must also take and receive an acceptable score on the TOEFL or IELTS.

Degree Requirements

15 credit hours (5 required courses)

Course Descriptions

PTC 780 Health Focused Care in Physical and Occupational Therapy (3 credits) - Provides an overview of health promotion principles as part of contemporary health care, especially rehabilitation services, including evidence for the most prevalent preventable chronic diseases/conditions and the health behaviors that contribute to these conditions. Health focused care competencies, including conducting health needs assessments, accessing health information/data, and exploring factors that influence learning will be addressed. Competencies related to selecting, designing, implementing and evaluating health education strategies and interventions will also be explored. Specific constructs of health behavior theories will be examined. Emphasis will be placed on applications of these theories to analyze unhealthy behaviors and/or assist patients/clients and community groups to adopt healthy behaviors through direct health promotion interventions, consultation, or referral to other health care providers.

PTC 781 Health Focused Patient/Client Communication and Advocacy (3 credits) – Communication and advocacy strategies, methods and techniques that empower individuals and communities to improve their health. Promoting patient autonomy, enhancing health literacy, and using strategies such as motivational interviewing will be considered as integral parts of physical and occupational therapy models of care to facilitate dialogue toward healthy behavior choice. E-health applications and telemedicine will be introduced. Best practices for consultation/referral processes to optimize health outcomes will be discussed. Strategies to influence policy to promote health will also be considered.

PTC 782 Health Focused Patient/Client Management I (3 credits) – This first of two application

courses will examine how PTs and OTs should address physical activity/fitness, nutrition optimization, and weight management using a health focused care model for individuals and community groups. Issues addressed include screening, best practices for interventions, patient education resources, and consultation/referral sources to optimize health outcomes.

PTC 783 Health Focused Patient/Client Management II (3 credits) – This second of two Health Focused Management courses will examine smoking cessation, alcohol moderation, sleep health, and stress management using a health focused care model for individuals and community groups. Issues addressed include screening, best practices for interventions, patient education resources, and consultation/referral sources to optimize health outcomes.

PTC 784 Health Focused Care – Synthesis Project (3 credits) - This course will enable PTs and OTs to design a health focused program in the clinical and community setting. The course will address managing fiscal resources, obtaining acceptance and support for programs, human resource management, risk management, legal and ethical issues, and facilitating partnerships in support of health promotion. The course will include a comprehensive final presentation using an online format. The presentation will address concepts presented throughout the curriculum and the application of these concepts to patients/clients in a specific clinical setting

Health Informatics (M.S.H.I.)

Degree Offered: M.S.H.I.

Acting Director: Dr. Gerald L. Glandon

Phone: (205) 934-3509

E-mail: mshi@uab.edu

Web site: www.uab.edu/hi

Core Faculty

Eta S. Berner, Ed.D. Professor (Health Services Administration)

Darrell Burke, Ph.D, Professor (Health Services Administration)

Amanda D. Dorsey, M.S.H.I., Instructor & Assistant Program Director (Health Services Administration)

Glenn G. Hammack, O.D., M.S.H.I., Assistant Professor (Health Services Administration)

Other Participating Faculty

Jeffrey H. Burkhardt, Ph.D., Associate Professor (Health Services Administration)

Dongquan Chen, Ph.D., Research Assistant Professor (Health Services Administration)

Kay Clements, M.A., Associate Professor (Health Services Administration)

Beverly Golightly, M.S.H.A., Credit Course Instructor (Health Services Administration)

Gary J. Grimes, Ph.D., Professor (Electrical and Computer Engineering)

Sara S. Grostick, M.A., Associate Professor (Health Services Administration)

Randa Smith Hall, M.S.H.A., Assistant Professor (Health Services Administration)

J. Michael Hardin, Ph.D., Credit Course Instructor (Health Services Administration)

S. Robert Hernandez, Ph.D., Professor (Health Services Administration)

Joan C. Hicks, M.S.H.I., Assistant Professor (Health Services Administration)

Tee H. Hiett, Ph.D., Professor Emeritus (Health Services Administration)

Howard W. Houser, Ph.D., Professor (Health Services Administration)

Shannon Houser, Ph.D., Assistant Professor (Health Services Administration)

Thomas K. Houston, II, M.D., Assistant Professor (Medicine, General/Internal)

Stephen A. Moser, Ph.D., Associate Professor (Pathology/Microbiology)

Stephen J. O'Connor, Ph.D., Professor (Health Services Administration)

Pamela E. Paustian, M.S.M., Assistant Professor (Health Services Administration

Craig C. Pearson, M.S.H.I., Credit Course Instructor (Health Services Administration)

M. Paige Powell, Ph.D., Assistant Professor (Health Services Administration)

T. Scott Plutchak, M.A., Associate Professor (Lister Hill Library of the Health Sciences)

Midge N. Ray, M.Ed., Associate Professor (Health Services Administration)

Tommy J. Sanders, Ph.D, Credit Course Instructor (Health Services Administration)

Richard M. Shewchuk, Ph.D., Professor (Health Services Administration)

Donna J. Slovensky, Ph.D., Professor (Health Services Administration)

Thomas E. Terndrup, M.D., Professor (Emergency Medicine)

Michael R. Waldrum, M.D., Professor (Internal Medicine/Pulmonary & Critical Care Medicine)

Norman W. Weissman, Ph.D., Professor (Health Services Administration)

Adjunct Faculty

David M. Bowen, Adjunct Professor (Health Services Administration)

Randy Carpenter, M.S.H.I., Adjunct Professor (Health Services Administration)

Steve Flammini, Credit Course Instructor (Health Services Administration)

R. David Friday, M.S.H.I., Adjunct Instructor (Health Services Administration)

Terrell W. Herzig, M.S.H.I., Credit Course Instructor (Health Services Administration)

Jacqueline W. Kennedy, Adjunct Professor (Health Services Administration)

Michael E. McDevitt, Adjunct Professor (Health Services Administration)

Tim Stettheimer, Adjunct Professor (Health Services Administration)

Pele Yu, M.D., Adjunct Instructor

Program Information

Program Admission

Admission to the program is in the fall semester. Application to the program may be made September through April 30, preceding the expected date of enrollment for the next fall term. Applications received after April 30 are considered on a space-available basis. Applications are evaluated against the Graduate School criteria and those criteria developed specifically for the HI program. The ideal size of each entering class is 20 to 25 students.

Admission Requirements

Admission to the program requires acceptance to the Graduate School of The University of Alabama at Birmingham. Applicants must have completed or anticipate completion of at least a baccalaureate

degree from a regionally accredited college or university or from a recognized university abroad before entering the program. As a criterion for unconditional admission, applicants must have no less than a B GPA (3.0 on a 4.0 scale) for the last 60 semester hours of earned undergraduate credit or overall undergraduate credit or overall undergraduate hours. Official transcripts of all previous academic work beyond the secondary level should be submitted. Before matriculation, entering students must have received a final transcript for each degree received.

The applicant should include a carefully drafted statement about his or her personal interests, career goals, and relevant background experience and a professional resume.

Three **confidential** letters of recommendation from individuals qualified to write concerning your potential success in both a graduate program and in the Health Informatics field must be submitted.

Prior to entering the program, applicants should have completed three hours of undergraduate course work in event-driven programming (e.g., Visual Basic, C++, Java, XML, .Net). The program has two additional co-requisites: a graduate level healthcare financial management course and a graduate level quantitative methods course. These do not have to be completed prior to entering, but must be completed by the time a student graduates.

Admission to the HI program is determined by an interview process and the consensus of the Admissions Committee. The decision is based on previous academic record, standardized admission test scores, professional recommendations and evidence of ability to perform graduate-level work. The program director reserves the prerogative for final recommendation on admission status to the Graduate School.

Additional Information

Deadline for Entry Term(s):	Fall
Deadline for All Application Materials to be in the Graduate School Office:	**April 30**
Number of Evaluation Forms Required:	Three
Entrance Tests	(TOEFL and TWE also required for international applicants whose native language is not English.)
Comments	None

For detailed information, contact Master of Science in Health Informatics Program, UAB School of Health Professions, Webb 532; physical address: 1675 University Blvd.; mailing address: 1530 3rd Avenue South, Birmingham, AL 35294-3361

Telephone 205-934-3509

Fax 205-975-6608

E-mail **mshi@uab.edu**

Course Descriptions

Note: The curriculum consists of ten (10) Core Courses and either an eight (8) hour Administrative Internship or a six (6) hour Non-thesis Project for a total program of 48 semester credit hours. Two (2) credit hours of HI 698 (Master's Level Non-Thesis Research Project/Credit Course) will be required for all students who plan to complete a project instead of an internship.

Health Informatics (HI)

600. **Analysis and Design of Health Information Systems**. Requirements, concepts, methods, and tools in analyzing, modeling, and designing health information systems with emphasis on clinical systems. Prerequisites: Current computer programming language course. 4 hours.

601. **Databases and Data Modeling**. Concepts of data modeling, data architectures and data administration. Study of various models with application to current healthcare IT initiatives. Course will include weekly on-line labs to provide hands-on use of databases, modeling tools to illustrate the impact of design principles on integrated data healthcare systems. Prerequisite: HI 600 or permission of instructor. 4 hours.

602. **Clinical and Administrative Systems**. Foundations of clinical information use with an emphasis on the Electronic Health Record and information collection, processing (e.g., decision making), recording and dissemination in inpatient and outpatient facilities. Special emphasis on the clinician's workflow to support enterprise-wide health care delivery. Prerequisites: 640 or permission of instructor. 4 hours.

605. **Communications and Networks**. Local & wide area networking and communication technologies as it applies to health information systems. Telecommunication technologies supporting the Internet and campus networks are emphasized. Technologies such as Ethernet, Asynchronous Transfer Mode (ATM), Integrated Services Digital Network (ISDN), Digital Subscriber Lines (xDSLs), and new global mobile (wireless) technologies. Emphasis is placed on the practical use, implications for the architecture of the

next generation of health information systems, and in strategic planning of the technical aspects of integrated health information networks. Prerequisites: HI 640 or permission of instructor. 4 hours.

610. **Project Management for Health Services Executives.** Concepts and techniques in health care organizations for maintaining and effective management of organizational information through system implementation case studies. Special emphasis on communications plans, resource allocation, risk management, various quality management methods, and the integration of scope, time and cost management. Prerequisites: HI 640 or permission of instructor. 4 hours.

612. **Organizational Behavior and Leadership**. Systematic examination of human behavior in healthcare-specific settings. Emphasis on study of individuals and small groups; personality, perception, attitudes, motivation, communication, and leadership. Case discussions and textbook readings. Prerequisite: 4 hours.

615. **Decision Support Systems**. Examination of the role of information systems in supporting administrative and clinical decision-making in health care enterprises. Case studies of the design and use of computer-based decision support and modeling systems. Prerequisites: HI 640 and or permission of instructor. 3 hours.

620. **Security and Privacy in Health Care**. Security and privacy issues, legislation, regulations, and accreditation standards unique to health care domain. Technical security of networks, databases, audit mechanisms and control. Privacy implications for the Electronic Health Record and organizational planning. Prerequisites: HI 602, 605, and 640, or permission of instructor. 3 hours.

630. **Strategic Planning and Contracting for Health Information Systems**. Theory, practice, and processes needed for strategic planning of integrated health information systems. Assessing benefits of enterprise-wide information integration and tactics needed to attain benefits realization. Steps needed for developing strategic plans that are aligned with goals of health care institutions using case studies and in team projects. Development of a Request for Proposal (RFP) based on strategic plans. Critique and practice of skills needed to negotiate contracts with vendors. Prerequisites: HI 600, 601, 602, 605, and 640, or permission of instructor. 4 hours.

640 **Introduction to Health Informatics and Health Care Delivery**. History and current status of information systems in health care and health care information systems. Information architectures, administrative and clinical applications, strategic planning, security, and benefits realization. Prerequisite: Permission of instructor. 3-4 hours. The 3-credit hour option is used for MSHI/MSHA dual degree students.

Non-Thesis Project, or Administrative Internship: Each student must complete an administrative internship or a non-thesis research project. Each student, in consultation with Program Faculty, chooses the most appropriate option. Prior to enrolling for the thesis or project, students will enroll in two 1-hour planning courses under the direction of the Projects and Internship Coordinator, in the fall and spring semesters prior to completing their Non-Thesis Research Project in the final semester. **The UAB Graduate School requires that you be enrolled during the semester in which you plan to graduate**

690. **Administrative Internship**. Structured field experiences in health care or other enterprises associated with health care industry. Includes a mentoring relationship with a preceptor and an opportunity for application of skills learned in the MSHI program. Foundation for professional development and assists in refining skills and behaviors necessary for successful practice in a complex professional, social, political, and technological environment. Prerequisite: Permission of Internship Coordinator. 4-8 hours.

698. **Master's Level Non-thesis Research Project**. Rigorous project that provides opportunity for focused investigation of informatics problem in real-world setting and for application of problems solving methodologies for development and execution of solutions. Investigation and application of theory through practical implementation project. Conducted during Administrative Internship; may be repeated for credit (minimum of 8 credit hours required for graduation). Prerequisite: Permission of instructor. 4-8 hours.

Prerequisites and Co-Requisites

Financial Management: The HI curriculum requires a minimum of one graduate-level course in financial management as a co-requisite. A graduate level financial management course can be completed either before enrolling in the HI Program or before graduating with the M.S.H.I. degree.

Quantitative Methods: The HI curriculum requires a minimum of one graduate-level course in quantitative methods as a co-requisite; a graduate-level finance course can be completed either before enrolling in the HI Program or before graduating with the M.S.H.I. degree.

Nutrition Sciences (Ph.D.)

Degree Offered:	Ph.D.
Director:	Dr. Jose Fernandez

Phone: (205) 934-2029

E-mail: jose@uab.edu

Web site: **www.uab.edu/nutrition**

Faculty

Krista Casazza, PhD, RD Assistant Professor (Nutrition Sciences); Resource partitioning during critical periods of growth and development with primary focus on the bone-fat interface.

Paula Chandler-Laney, PhD Assistant Professor (Nutrition Sciences); Use of behavioral and/or psychological parameters to predict success in weight loss and maintenance programs; the association between satiety hormones and subjective responses; and an investigation of childhood body composition and metabolic health consequences of intrauterine exposure to gestational diabetes and maternal obesity

Pi-Ling Chang, PhD, Associate Professor (Nutrition Sciences); Vitamin D and Cancer, Osteoporosis, Bone-Matrix Proteins, Osteoblast Differentiation

Maria De Luca, PhD Assistant Professor (Nutrition Sciences); Genetics of fat storage and innate immune function, Obesity, Aging.

Wendy Demark-Wahnefried, Phd, RD Professor and Webb Endowed Chair of Nutrition Sciences; diet/hormonal/genetic interactions and their association with cancer; dietary interventions and lifestyle for cancer prevention and survival

Isao Eto, **PhD** Associate Professor (Nutrition Sciences); Nutritional Biochemistry, Folate Metabolism and Interactions, Cancer Biology and Biochemistry

Jose R. Fernandez,**PhD** Associate Professor (Nutrition Sciences); Gene Mapping, Genetic Admixture, Racial Differences, Obesity, Diabetes

Yuchang Fu, **PhD** Assistant Professor (Nutrition Sciences); Gene Expression and Regulation Related to Lipid Metabolism in Atheroslcerosis and Diabetes

W. Timothy Garvey,**MD** Professor and Chair (Nutrition Sciences); Molecular, Metabolic, and Genetic Pathogenesis of Insulin Resistance, Type 2 Diabetes, and Obesity

Barbara A. Gower, **PhD**Professor (Nutrition Sciences); Endocrinology, Body Composition, Postmenopausal Hormone Replacement Therapy, Insulin Sensitivity

Elizabeth Kitchin, **PhD, RD** Assistant Professor (Nutrition Sciences); General Nutrition and Health, Community Outreach and Education through Media

Susan Miller, **MS, RD, LD** Assistant Professor; ~~Food Service Systems Management~~ Interim Director UAB Dietetic Internship and Graduate Program in Nutrition Sciences

Douglas Moellering, **PhD** Assistant Professor (Nutrition Sciences);; mitochondrial physiology, bioenergetics, and free radical-mediated tissue injury and disease pathologies. Currently, research is focused on mitochondrial free-radical production contributing to altered bioenergetics, the development of obesity, insulin resistance and T2DM, increased cardiovascular disease susceptibility, and aging.

Tim R. Nagy, **PhD** Professor (Nutrition Sciences); Regulation of Energy Expenditure; Body Fat/Caloric Restriction/Cancer; Small Animal Phenotyping

Laura Newton, **MAEd, RD, LD** Assistant Professor (Nutrition Sciences); Clinical Nutrition, Nutrition and Cancer; Total Parenteral Nutrtition

Chandrika Piyathilake,**PhD** Associate Professor (Nutrition Sciences); Lung Cancer and Biomarkers

Charles W. Prince, **PhD** Professor (Nutrition Sciences); Bone Metabolism, Vitamin D Function; Osteopontin, Orthopedic Implant Biocompatibility, Cellular Transduction of Mechanical Load

Daniel L. Smith, Jr, **PhD**Assistant Professor (Nutrition Sciences); The interaction of diet and metabolism in relationship to aging and disease; obesity, calorie restriction, brown adipose tissue

Taraneh Soleymani, MD Assistant Professor (Nutrition Sciences); Clinical nutrition, Weight lost and management.

Qinglin Yang, **PhD** Associate Professor (Nutrition Sciences); molecular mechanisms underlying the development and progression of heart failure, especially those related to transcriptional regulation of myocardial fatty acid and carbohydrate metabolisms (eg., PPAR signaling pathway) in pathological conditions such as hypertension, obesity and diabetes

Patients with Pediatric Disease

M.S. Program in Nutrition Sciences

Degree Offered: M.S

Director: Susan B. Miller

Phone: (205) 934-3223

E-mail: miller1@uab.edu

Web site: **www.uab.edu/nutrition**

The program leading to the Master of Science degree in nutrition sciences is designed to provide training and experience in the treatment and prevention of disease through the science and art of optimal nutritional care. Professionals with backgrounds in the science of nutrition or dietetics will have an opportunity to learn the metabolic and biochemical basis for nutritional care while being involved in direct patient management and in either laboratory or clinical research. Opportunities exist for specialization within clinical subspecialty areas such as pediatrics, children with special health care needs, clinical nutrition research, exercise science, health education, health services administration, community nutrition, and public health.

Admission

The Nutrition Sciences graduate program recommends fall-term entry. Interested students must first obtain admission to the UAB Graduate School. Graduate School admission standards include

1. a B average computed overall, or alternatively computed over the last 60 semester hours of earned credit;
2. evidence of a bachelor's degree from a regionally accredited university or college in the United States ; and
3. a score of at least 153 on the verbal and 144 on the quantitative sections of the GRE General Test.

Additionally, eligible students should be registered dietitians, registration-eligible dietitians, or have a baccalaureate degree from the Accrediting and Credentialing of Education for Nutrition and Dietetics (ACEND) approved Didactic Program in Dietetics. A nutrition research option is offered to nondietetics students with strong science backgrounds.

Degree Requirements

The graduate program in clinical nutrition offers the option for Plan I (thesis) or Plan 2 (non-thesis). Candidates for the M.S. degree, Plan 1, are expected to complete a minimum of 30 hours of graduate-level course work, and submit and defend thesis research that makes a contribution to the knowledge of clinical nutrition. Candidates for the M.S. degree, Plan 2, must complete a total of 36 hours of graduate-level course work.

Curriculum Core Requirements

Successful completion of the M.S. degree will require completion of a minimum of 20 semester hours in

Nutrition Sciences core courses and additional courses to be selected from departmental offerings. The thesis option (Plan 1) requires completion of 6 semester hours of thesis research and presentation of a thesis. Students completing Plan 2 will require a total of 36 semester hours in Clinical Nutrition.

Additional Information

Deadline for Entry Term(s):	Fall
Deadline for All Application Materials to be in the Graduate School Office:	Six weeks before term begins
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)

For detailed information, contact Susan B. Miller, Assistant Professor and Director, Graduate Program in Clinical Nutrition and Dietetic Internship, Department of Nutrition Sciences, UAB School of Health Related Professions, Webb Building, Room 449, 1675 University Boulevard, Birmingham, AL 35294-3360.

Telephone 205-934-3223

E-mail miller1@uab.edu

Web www.uab.edu/nutrition

Dietetic Internship

The Dietetic Internship Program is accredited by the Accrediting and Credentialing of Education for Nutrition and Dietetics (ACEND) and is designed to prepare entry-level dietitians for careers in a variety of health care, wellness, and food service facilities. Internship appointments are awarded on a competitive basis through a national computer matching process. Dietetic interns must also be admitted to the Graduate School (admission standards are listed under the M.S. in Nutrition Sciences above) and are required to enroll in a full graduate course load each term during the internship.

An onsite internship with is offered in Birmingham, and an offsite internship is offered in each of the following cities in Alabama: Huntsville, Mobile, Montgomery, and Birmingham. Upon completion of the internship, the student will be eligible to take the national examination to become a registered dietitian. Interns earn 12 hours of graduate credit, which may be applied toward the requirements for the M.S. in Nutrition Sciences. Students may elect to continue in the M.S. program in Nutrition Sciences to complete

requirements for the M.S. degree on a full or part-time basis.

Additional Information

For detailed information, contact Susan Miller, Assistant Professor and Interim Director, Graduate Program in Nutrition Sciences and Dietetic Internship, Department of Nutrition Sciences, UAB School of Health Related Professions, Webb Building, Room 441 1675 University Boulevard, Birmingham, AL 35294-3360.

Telephone 205-934-3223

E-mail dintr@uab.edu

Web www.uab.edu/nutrition

Ph.D. Program in Nutrition Sciences

The program leading to the Ph.D. in Nutrition Sciences at UAB is designed to provide coursework and research experience that emphasizes the science of nutrition in maintaining the health of individuals and populations and preventing a variety of diseases. The doctoral program combines required and elective didactic coursework in basic sciences and nutrition with research incorporating basic science, clinical applications and translational research conducted in superb facilities in an outstanding research environment.

Admission

To meet Graduate School and departmental standards, a student must have a combined GRE score of 1100, an undergraduate degree with a strong science background, three letters of recommendation based on thorough knowledge of the applicant's background and abilities, and, of great importance, a statement of goals and purpose that delineates the student's motivation and purpose in seeking this degree. Fall-term entry is recommended.

Coursework and Other Requirements

Successful completion of the Ph.D. will require completion of a minimum of 33 semester hours in core courses (encompassing the disciplines of cellular and molecular biology, biochemistry, physiology, nutritional biochemistry, clinical nutrition, and statistics and experimental design) and at least 24 additional graduate semester hours of elective coursework; passing a comprehensive written qualifying examination; and defense of a dissertation reporting the results of original scientific research that makes a genuine contribution to the knowledge of nutrition sciences. In fulfilling the latter requirement, a student must author at least three papers that are publishable in peer-reviewed journals.

Core Classes must include :NTR 701(Adv. Med NTR)(3), 718(Nutritional Biochem)(6), 725(Human NTR through the Life Cycle)(3), 726(Consumer Issues in NTR)(3), 733(Lab Rotation)(2). 736(Scientific Methods)(3), 747(Molecular Biology & NTR SCI(3), 788(Seminar)(4), BST 621(3), 622(3)

Elective classes: 722 (Cancer) (3), 750(Body Comp) (3), 769(Obesity)(3), 779(Race)(3), 604(Nutrition Support)(3)

Additional Information

For detailed information, contact Dr. José R. Fernández, Director of the Ph.D. Program in Nutrition Sciences, Department of Nutrition Sciences, UAB School of Health Related Professions, Susan Mott Webb Nutrition Sciences Building, Room 449, 1675 University Boulevard, Birmingham, AL 35294-3360.

Telephone 205-975-2029

E-mail phdntr@uab.edu

Web www.uab.edu/nutrition

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

Nutrition Sciences (NTR)

579/779. **Obesity in the 21st Century** Overview of the facts and research findings underlying the understanding of obesity, its co morbidities, and its consequences in the population. Spring, Odd years.

589. **Internship Practicum**. Clinical experience in food service management and clinical nutrition. Fall, spring, summer.

601/701. **Advanced Medical Nutrition**. Nutrition in relationship to health; prevention of disease and correction of disorders resulting from nutritional imbalance throughout the life cycle. Prerequisite: Permission of instructor for non nutrition sciences majors. Spring 604. **Principles and Practice of Nutrition Support**. Nutrition support for critically ill patients; theory integrated with clinical practice. Prerequisite: Permission of instructor for non nutrition sciences majors. Fall

611. **Advanced Food Service Systems Management**. Management systems, application to hospital food service. Prerequisite: Permission of instructor Prerequisite: Permission of instructor for non nutrition sciences majors. Spring

612. **Research and Technology Applications in Dietetics.** Utilization of internet technology and research design in dietetics practice. Prerequisite: Permission of instructor for non nutrition sciences majors. Fall

618/718. **Nutritional Biochemistry**. Metabolism and functions of nutrients; biosynthesis of vitamins and cofactors; human requirements for energy, amino acids, minerals, and vitamins; food fortification; current human nutritional problemsFall . 6 hours.

622/722. **Recent Advances in Nutrition Cancer Research**. Critical evaluation of the effects of genetics and environmental factors, especially nutrients, on the development and prevention of obesity, atherosclerosis, and cancer. Prerequisite: Permission of instructor.

625/725. **Human Nutrition Through the Life Cycle**. Examination of the role of nutrition and dietary factors on the growth, development, and maintenance of health throughout the human life cycle. Nutritional guidelines/recommendations, special nutritional needs, physiology, and nutritional health concerns for each stage of the human lifecycle beginning with preconception and continuing throughout adulthood and aging. Fall Odd years

626/726. **Consumer Issues in Nutrition**. Examination of contemporary nutritional issues that affect consumers. Focus on the translation of science to public policy, consumer communications, and food choices. Spring Odd years

630. **Maternal Child Health in Pediatric Nutrition** This course provides a public health approach to pediatric and MCH nutrition. The focus will be on the translation of evidence based approaches to pediatric nutrition including prevention and intervention. The course will emphasize the interdisciplinary aspects of care in pediatrics by utilizing guest speakers from a variety of disciplines. The course will cover topics and current issues in pediatric nutrition (e.g., obesity, media influences, diversity, food & nutrition policy, and chronic disease prevention and intervention). The development of written and verbal communication skills will also be stressed.

633/733. **Laboratory Instruments and Methods in Nutrition Research**. Operation, capabilities, and limitations of laboratory instruments. Prerequisite: Permission of instructor. 1-3 hours.

636/736. **Scientific Methods**. Investigations in nutrition using animal models and laboratory procedures, design of experiments, data collection, analysis, interpretation, and communication of experimental results. Prerequisite: Permission of instructor. Spring

650/750. **Body Composition and Energy Metabolism**. Methods of measurement and relationship to

human health and disease. Prerequisite: Permission of instructor. Summer Even years

680. **Journal Club in Clinical Nutrition**. Review and critique of current literature in clinical nutrition. 1 hour.

685. **Pediatric Pulmonary Care: An Interdisciplinary Approach**. Health care delivery to pediatric clients at risk for or compromised by pulmonary disease. Prerequisite: Permission of instructor.

690. **Seminar**. Review of current literature and research in nutrition. Prerequisite: Permission of instructor. 1 hour. Fall , Spring

691. **Clinical Practicum: Nutritional Aspects of Mental Retardation and Developmental Disabilities**. Clinical experiences in evaluation of nutritional status, feeding behavior and food habits of mentally retarded and developmentally disabled children. Prerequisite: Permission of instructor. 1-6 hours.

692. **Clinical Practicum: Community Nutrition**. Clinical experiences in health care delivery systems with nutrition components. Prerequisite: Permission of instructor. 6 hours.

693. **Clinical Practicum: Pediatric Nutrition**. Clinical experiences in normal growth patterns in children; nutritional needs in health and disease. Prerequisite: Permission of instructor. 6 hours.

694. **Clinical Practicum: General Clinical Research**. Clinical experiences in a multidisciplinary research facility involving human subjects. Prerequisite: permission of instructor. 1-6 hours.

695. **Special Problems**. To meet individual student needs; clinical rotation, review of current literature, completion of defined objectives. Prerequisite: Permission of instructor. 1-3 hours.

696. **Clinical Practicum: Nutritional Support of Pediatric Clients with Pulmonary Problems**. Observation of and participation in interdisciplinary team delivery of health care to pediatric patients with pulmonary disease. Prerequisite: Permission of instructor. 1-6 hours.

697. **Clinical Practicum: Nutrition Support Service**. Interdisciplinary team delivery of nutrition support to critically ill hospitalized patients and ambulatory patients. 3-6 hours.

698. **Master's Nonthesis Research**. Prerequisite: Permission of instructor. 1-6 hours.

699. **Master's Thesis Research**. Prerequisites: Admission to candidacy and permission of instructor. 1-9 hours.

747. **Molecular Biology and Nutrition Sciences**. Overview of molecular biology applications in nutrition

science research. Examination of basic molecular biology techniques, current usage of molecular biology to solve nutrition problems, and application of biotechnology to study disorders with a nutritional component. Prerequisite: Permission of instructor. Fall. Even years

769. **Race and Ethnic Disparities as a Health Concern** Introduction to the identification, measurement and exploration of etiological factors that underlie racial/ethnical disparities in health outcomes.

778. **Special Topics in Nutrition Sciences**. Fall, spring, summer. 1-5 hours.

788. **Advanced Nutrition Seminar**. Fall, spring, summer. 1 hour.

798. **Doctoral Nondissertation Research**. 1-15 hours.

799. **Doctoral Dissertation Research**. Prerequisite: Admission to candidacy. 1-15 hours.

Occupational Therapy

Degree Offered: Master of Science

Director: Dr. Brian J. Dudgeon

Phone: (205) 975-6101

Web site: **http://www.uab.edu/ot/programs/ot-programs**

Faculty

Elizabeth A. Barstow, Assistant Professor (Occupational Therapy); Low-Vision Rehabilitation, Neurodevelopmental Intervention, Functional Capacity Evaluations, Driver's Assessment

Anthony "Deek" Cunningham, Assistant Professor (Occupational Therapy); Mental Health, Pediatrics, Burns and Trauma

Stephanie C. DeLuca, Assistant Professor (Occupational Therapy); Research and Development of New and Efficacious Treatment Techniques for Children with Neuromotor Disorders.

Brian J. Dudgeon, Department Chair and Professor

Christopher Eidson, Assistant Professor (Occupational Therapy), Academic Coordinator of Fieldwork Education

Kathleen Foley, Assistant Professor (Occupational Therapy); Physical Dysfunction, Gerontology, Pathophysiology

Gavin Jenkins, Assistant Professor (Occupational Therapy); Assistive Technology and the Built Environment

Jan A. Rowe, Associate Professor (Occupational Therapy); Pediatrics, Community Practice, Tourette syndrome clinic

Laura K. Vogtle, Professor (Occupational Therapy); Pediatrics, Research Methods, Program Evaluation, Outcomes Research

Mary Warren, Associate Professor (Occupational Therapy); Low-Vision Rehabilitation, Neurology, Physical Dysfunction

Hon Yuen, Professor and Director of Research

Program Information

The Department of Occupational Therapy at the University of Alabama at Birmingham offers an entry level Master of Science degree in occupational therapy (MSOT) for individuals who hold a baccalaureate degree in a field other than occupational therapy. For individuals without a baccalaureate degree, this curriculum is also offered in conjunction with the undergraduate Health Care Management program as a 3:2 Fast OT option (http://www.uab.edu/ot/32-fast-ot).

MS Occupational Therapy

The MSOT entry-level, or professional program, is a full-time day program.

Accreditation

The program is fully accredited by the Accreditation Council for Occupational Therapy Education (ACOTE) of the American Occupational Therapy Association (AOTA), located at 4720 Montgomery Lane, Suite 200, Bethesda, MD 20824-3449; telephone: (301)652-AOTA.

Credentials Conferred

The Master of Science degree is awarded by the University of Alabama at Birmingham.

Professional Certification

Graduates of the program are eligible to sit for the national occupational therapist certification examination administered by the National Board for Certification in Occupational Therapy (NBCOT); website: www.nbcot.org After successful completion of the exam, the individual will be an Occupational Therapist, Registered (OTR). Most states require licensure in order to practice; however, state licenses are usually based on the results of the NBCOT Certification Examination.

Applicants should be aware that fieldwork placement sites, professional licensing agencies and prospective employers frequently require criminal history disclosures and background checks, although convictions do not necessarily disqualify someone for licensure or employment. Applicants with criminal convictions should recognize that such convictions may impede eventual licensure or employment and that the University of Alabama at Birmingham cannot predict the future decisions of fieldwork sites, licensing agencies, or employers.

Length of Study

Entry level program: Minimum of 7 semesters (2 1/2 years) as a full-time student.

Program Entrance Date

Fall semester of each year a new class is enrolled.

Application Deadline

This program has rolling admissions and participates in the Occupational Therapy Centralized Application Service (OTCAS); early submission of the application is encouraged. Please consult www.otcas.org for more information regarding specific OTCAS application requirements, procedures, dates, and fees.

International Students

See Occupational Therapy Entry Level Admissions Checklist at the top of the page--In addition to these items:

a) Complete and submit UAB Graduate School International application;
b) Request one (1) official transcript to be mailed by the issuing institution to the UAB Graduate School; a transcript evaluation from World Education Services (www.wes.org) or Educational Credential Evaluators (www.ece.org) is required;
c) Students from countries where English is not the official and primary language must take and receive an acceptable score on the TOEFL or the IELTS;
d) Submit official TOEFL test score: Institution code: 1856 or official IELTS score (provide the

Graduate School's mailing address to the testing company/center; and

e) Mail Financial affidavit of Support

Requirements for Admission

Selection into the program will be based on the student's academic performance record aptitude for a career as an occupational therapist, and a group interview. The candidate must satisfy the following requirements:

- hold a baccalaureate degree in a discipline other than occupational therapy from an accredited college or university; or receive a baccalaureate degree in a discipline other than occupational therapy by the time of enrollment;
- complete required prerequisite coursework with a grade of “C” or better;
- have a minimum overall GPA of 3.0 (A = 4.0);
- have a minimum GPA of 3.0 (A = 4.0) in the natural science coursework;
- have a minimum GPA of 3.0 (A=4.0) in the last 60 hours of coursework;
- if invited, participate in a group interview with members of the faculty of the Department of Occupational Therapy. The interview is scheduled once the application is received and verified.

Procedures Following Acceptance

Once accepted, students will be allowed to enroll into the program in the desired entry year only if the following requirements are met:

- medical clearance requirements posted at www.uab.edu/studenthealth/medical-clearance;
- application to and acceptance by the Graduate School (http://www.uab.edu/graduate/online-forms) including the fee.
- signed Letter of Intent received by the Department of Occupational Therapy; with,
- $300 nonrefundable-deposit to reserve a seat in the program (deposit will be applied to tuition)

Essential Requirements

Prior to enrollment, students must certify their ability to complete the essential tasks, with or without reasonable accommodation, associated with performing as an occupational therapy student. Reasonable accommodation refers to ways in which the University can assist students with disabilities to accomplish these tasks (for example, providing extra time to complete an examination or enhancing the sound system in a classroom). Reasonable accommodation does not mean that students with disabilities will be exempt from certain tasks; it does mean that the Department of Occupational Therapy will work with students with disabilities to determine whether there are ways to assist the student with completion of the required tasks.

After enrollment, a student with a disability who wishes reasonable accommodation contacts Disability Support Services (205) 934-4205 or (205) 934-4248 (TDD) or visits 516 Hill University Center, provides appropriate and current documentation substantiating the claimed disability, meet the requirements of a disability as described in the ADA, and identify the needed accommodation. Reasonable accommodation in classroom and in practice settings cannot be provided without the formal request and the required documentation of the ADA defined disability. (Visit http://www.uab.edu/dss)

Essential Tasks

Students must meet class standards for course completion throughout the curriculum.
Students must be able to read, write, speak, and understand English at a level consistent with successful course completion and development of positive client-therapist relationships.
Students must complete readings, assignments, and other activities outside of class hours.
Students must gather decision-making pieces of information during client assessment activities in class or in the fieldwork setting without the use of an intermediary, such as a classmate, an occupational therapy assistant, or an aide.
Students must perform intervention activities in class or in the fieldwork setting by direct performance or by instruction and supervision of intermediaries.
Students must apply critical thinking processes to their work in the classroom and in the fieldwork setting, exercise sound judgment in class and in fieldwork, and follow safety procedures established for each class and fieldwork setting.
Students must have interpersonal skills as needed for productive classroom discussion, respectful interaction with classmates and faculty, and development of appropriate therapist-client relationships.
Students must maintain personal appearance and hygiene conducive to classroom and fieldwork settings.
Students must pass a cardiopulmonary resuscitation course at the health professional level (American Heart Association, Course C) every two years under Alabama guidelines for CPR certification.
Students must demonstrate appropriate health status prior to enrollment, with annual updates on some items. Requirements are posted at www.uab.edu/studenthealth.
Students must annually complete OSHA-regulated Bloodborne Pathogen Exposure Training.
Students must follow standards and policies specified in the Department of Occupational Therapy Student Manual, the Letter of Understanding (contract between university and fieldwork sites), and the Graduate Student Handbook. (See Section IX Fieldwork Experience for ADA issues related to fieldwork)

Program Prerequisites - UAB Equivalents*

(Course requirements are listed in semester credit hours)

Completion of prerequisite coursework within the last 8 years with a grade of “C” or better. All

prerequisites do not have to be completed at the time of application; however, courses must be completed by June 1st of the entrance year. Depending on the number and type of outstanding prerequisite courses, you may be accepted into the program early with certain conditions such as a requirement to achieve a grade of B or better in a course.

Have a minimum 3.0 (A=4.0) grade point average (GPA) overall, in the natural science courses, and last 60 semester hours.

Prerequisite Courses Required	Semester Hours	UAB Equivalent
Biology with lab	4	BY123+L
Human Anatomy with lab	4	BY115+L
Human Physiology with lab	4	BY116+L
Physics	3	PH201
Abnormal Psychology	3	PY218
Developmental or Lifespan Psychology (must be birth through death)	3	PY212
Research Methodology	3	PSC411 PY315 SW320 AHS460
Sociology Elective	3	SOC101
Anthropology Elective	3	ANTH101

UAB Entry-level Occupational Therapy Program does not require the GRE.

Typical Program

(Course requirements are listed in semester credit hours)

Fall Semester I	
OT 607 Analysis of Occupational Performance	(3)
OT 620 Foundations of Occupation: A&P	(4)
OT 667 Research Methods	(4)
OT 675 History and Theory of Occupation	(3)
OT 677 Foundations of Low Vision Rehabilitation	(3)
OT 688 Occupation and Health: Groups &Communities	(1)
OT 698 Master's Level Non-Thesis Research	(1)
Spring Semester II	
OT 605 Therapeutic Skills	(3)
OT 606 Occupation Based Practice Models	(3)
OT 610 Mental Health Diagnoses Across the Lifespan	(3)
OT 623 Foundations of Occupation: Neuroscience	(3)
OT 631 Foundations of Occupation: Biomechanics	(4)
OT 688 Occupation and Health: Groups & Communities	(1)
OT 698 Master's Level Non-Thesis Research	(1)
Summer (12 week session) Semester III	
OT 609 Barriers to Occupational Performance	(3)
OT 624 Occupations of Infants, Children, & Adolescents	(4)

OT 632 Fieldwork Seminar I	(1)
OT 662 Enhancing Occupational Performance: Orthotics, Prosthetics, and other Modalities	(4)
OT 673 Engagement in Occupations Through Technology 1	(3)
OT 688 Occupation and Health: Groups & Communities	(2)
OT 698 Master's Level Non-Thesis Research	(1)
Fall Semester IV	
OT 625 Occupations of Adults and Older Adults I	(4)
OT 633 Fieldwork Seminar II	(1)
OT 661 Wellbeing and Health Through Occupations	(3)
OT 668 Mental Health Practice in Adulthood	(4)
OT 674 Engagement in Occupations Through Technology II	(3)
OT 688 Occupation and Health: Groups & Communities	(1)
OT 698 Master's Level Non-Thesis Research	(1)
Spring Semester V	
OT 634 Seminar in Professional Readiness	(2)
OT 653 Using the Lit: Evidence Based Practice	(3)
OT 663 Promoting Occupations of Communities, Organizations, & Systems of Practice	(2)

OT 665 Occupations of Adults and Older Adults II	(4)
OT 688 Occupation and Health: Groups & Communities	(2)
OT 698 Master's Level Non-Thesis Research	(2)
Summer Semester VI	
OT 685 Advanced Field Experience I	(10)
Fall Semester VII	
OT 686 Advanced Field Experience II	(10)

A minimum total of six credit hours Master's Level Non-Thesis Research must be completed to meet graduation requirements.

For further information contact:
UAB, Department of Occupational Therapy
Recruitment and Admissions Coordinator
SHPB 353
1720 2nd Avenue South
Birmingham, AL 35294-1212
Telephone 205-934-7323
E-mail **msot@uab.edu**
Web **www.uab.edu/OT/otel**

For course descriptions, see the UAB School of Health Professions Catalog-Course descriptions.

Postprofessional Degree

Deadline for entry term(s):	Low vision students enter when low vision coursework starts

Deadline for all application materials to be in the graduate school office:	One semester preceding the expected semester of enrollment.
Number of evaluation forms required:	Three
Entrance tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)
Comments	None

Postprofessional Occupational Therapy Program

The program offers postprofessional education to occupational therapists who wish to learn advanced theoretical, practice, and research skills. Currently one online specialization option exists for the postprofessional – low vision. Students interested in low vision must be accepted into the low vision certificate program prior to applying for the postprofessional master's degree. The 33- semester hour program for low vision option guides the student through coursework for the areas indicated including theory, specialty practice application, research methodology, and a final project or thesis. Elective coursework from related departments taken prior to admission may be approved for degree requirements; however, you must submit a copy of the course syllabus and the year and semester you took the course before final decisions are made regarding approval. Graduates of the program may use this degree to enter specialized areas of practice, as part of the requirements for specialty certifications, to assume leadership positions within the profession, or to prepare for doctoral level study.

Credentials Conferred

The Master of Science degree is awarded by the University of Alabama at Birmingham.

Length of Study

Approximately 11 semesters are needed to complete this degree. The low vision option was designed specifically for part-time online students.

Program Entrance Date

Low vision students accepted as post-professional students enter at the inception of low vision coursework. Students who wait until they have taken some of the low vision courses, must apply prior to completing the low vision coursework in order to use their low vision application and fee. If students choose to apply to the postprofessional master's program after completing the certificate, a new

application and fee will be required.

Application Deadline and Procedure

See Occupational Therapy Postprofessional Admissions Checklist at the top of this page.

International Students

See Occupational Therapy Postprofessional Admissions Checklist at the top of this page, in addition to the items listed below:

UAB Graduate School international application

Request one (1) official transcript to be mailed by the issuing institution to the UAB Graduate School;
A transcript evaluation from World Education Services (www.wes.org) or Educational Credential Evaluators (www.ece.org) is required;
Students from countries where English is not the official and primary language must take and receive an acceptable score on the TOEFL or IELTS
Submit official TOEFL test score: (Institution code: 1856) or official IELTS score (provide the Graduate School's mailing address to the testing company/center.
For the postprofessional Master's Degree, the occupational therapy school attended **must** be approved by the World Federation of Occupational Therapy.

Requirements for Admission

For unconditional acceptance, the student must satisfy the following requirements:

- a baccalaureate degree in occupational therapy from an accredited educational program with a minimum cumulative GPA of 3.0 (A = 4.0) computed over the last 60 hours of course work;
- eligibility for licensure as an occupational therapist in the United States;
- an acceptable score on each section of the GRE general test;
- completed application for admission to the UAB Graduate School;
- three letters of reference;
- if accepted, complete the UAB medical requirements posted at www.uab.edu/studenthealth.

Essential Requirements

After acceptance and prior to enrollment into online programs, students must certify their ability to complete the essential tasks, with or without reasonable accommodation, associated with performing as an occupational therapy student. Reasonable accommodation refers to ways in which the University can

assist students with disabilities to accomplish these tasks (for example, providing extra time to complete an examination or enhancing the sound system in a classroom). Reasonable accommodation does not mean that students with disabilities will be exempt from certain tasks; it does mean that the Department of Occupational Therapy will work with students with disabilities to determine whether there are ways to assist the student with completion of the required tasks.

After enrollment, a student with a disability who wishes reasonable accommodation contacts Disability Support Services (205) 934-4205 or (205) 934-4248 (TDD) or visits 516 Hill University Center, provides appropriate and current documentation substantiating the claimed disability, meet the requirements of a disability as described in the ADA, and identify the needed accommodation. Reasonable accommodation in classroom and in practice settings cannot be provided without the formal request and the required documentation of the ADA defined disability. (Visit http://main.uab.edu/dss).

Essential Tasks

- Students must meet class standards for course completion throughout the curriculum;
- Students must be able to read, write, speak, and understand English at a level consistent with successful course completion;
- Students must complete readings, assignments, and other activities outside of class hours;
- Students must apply critical thinking processes to their work in the classroom and exercise sound judgment in class during online discussions;
- Students must have interpersonal skills as needed for productive classroom discussion, and respectful interaction with classmates and faculty;
- Students must demonstrate appropriate health status prior to enrollment, with annual updates on some items;
- Students must follow standards and policies specified in the Department of Occupational Therapy; Student Handbook, and the University of Alabama at Birmingham Directions Handbook.
- Students must adhere to all policies outlined in the Department of Occupational Therapy Student Handbook which will be displayed in the Resource section of each online course.

Postprofessional curriculum

(Course requirements are listed in semester credit hours)

Students must specify a specialty area prior to entering the program. Your stated area of interest will dictate the coursework required for completion of the post professional master's degree. Required coursework for the Low Vision Rehab Graduate Certificate (15 hours) can be viewed at www.uab.edu/lowvision

Students in both programs need to complete the following courses:

*OT 642 Research Design in OT (1-3)
*OT 643 Data Analysis in OT Research (1-3)
*OT 644 Project Dissemination-Professional Writing and Presentation (1-3)
OT 647 Leadership in Occupational Therapy (2)
OT 653 Using the Lit: Evidence-Based Practice (3)
OT 658 Foundations of Professional Education (4)
OT 667 Research Methods (3)
OT 692 Selected Topics in OT (1-3)

* Courses designed for final project completion

Electives offered outside of the occupational therapy curriculum in programs at UAB are allowed with the permission of the advisor. Up to 12 hours of coursework taken at other institutions may apply as well but must be approved by the student's advisor and must be completed with a grade of B or better. A copy of the course syllabus is required for approval.

For further information contact:
Laura K. Vogtle, PhD, OTR/L, FAOTA
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Occupational Therapy Postprofessional Program
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Low Vision Rehabilitation, Graduate Certificate

The Graduate Certificate in Low Vision Rehabilitation is a practice oriented certificate degree program that prepares occupational therapists to provide comprehensive, competent intervention to adults with visual impairment from age related eye diseases and brain injury. The program is designed for occupational therapists already working in low vision rehabilitation; those interested in starting low vision

rehabilitation programs; and those just interested in expanding their practice skills. The program's flexible web-based distance format allows occupational therapists across the United States and other English speaking countries to obtain these skills while working full time.

Credentials Conferred

The Graduate Certificate in Low Vision Rehabilitation awarded by the University of Alabama at Birmingham.

Length of Study

The certificate requires 5 semesters to complete; students take 1 course per semester. Two co-horts of students are admitted each academic year-one for the fall semester and one for the spring semester.

Program Entrance Date

Spring Semester (begins in January) or Fall semester (begins in August)

Requirements for Admission

Degree in occupational therapy from an accredited university program.

Essential Requirements

After acceptance and prior to enrollment into online programs, students must certify their ability to complete the essential tasks, with or without reasonable accommodation, associated with performing as an occupational therapy student. Reasonable accommodation refers to ways in which the University can assist students with disabilities to accomplish these tasks (for example, providing extra time to complete an examination or enhancing the sound system in a classroom). Reasonable accommodation does not mean that students with disabilities will be exempt from certain tasks; it does mean that the Department of Occupational Therapy will work with students with disabilities to determine whether there are ways to assist the student with completion of the required tasks.

After enrollment, a student with a disability who wishes reasonable accommodation contacts Disability Support Services (205) 934-4205 or (205) 934-4248 (TDD) or visits 516 Hill University Center, provides appropriate and current documentation substantiating the claimed disability, meet the requirements of a disability as described in the ADA, and identify the needed accommodation. Reasonable accommodation in classroom and in practice settings cannot be provided without the formal request and the required documentation of the ADA defined disability. (Visit http://main.uab.edu/dss).

Essential Tasks

- Students must meet class standards for course completion throughout the curriculum.

- Students must be able to read, write, speak, and understand English at a level consistent with successful course completion and development of positive client-therapist relationships.
- Students must complete readings, assignments, and other activities.
- Students must gather decision-making pieces of information during client assessment activities.
- Students must perform evaluation and intervention activities by direct performance keys.
- Students must apply critical thinking processes to their work in the courses.
- Students must have interpersonal skills as needed for productive discussion, respectful interaction with classmates and faculty.
- Students must demonstrate appropriate health status prior to enrollment with annual updates on some items. Requirements found at www.uab.edu/studenthealth.
- Students must follow standards and policies specified in the Department of Occupational Therapy Student Handbook, and the University of Alabama at Birmingham Directions Handbook.
- Students must adhere to all policies outlined in the Department of Occupational Therapy Student Handbook which is posted online at http://www.uab.edu/ot/student-resources.

Application Deadline and Procedure

See Occupational Therapy Low Vision Rehabilitation Admissions Checklist at the top of the page.

International Students: See Occupational Therapy Low Vision Rehabilitation Admissions Checklist in addition to the following items:
A transcript evaluation from World Education Services (www.wes.org) or Educational Credential Evaluators (www.ece.org) may be required.
Students from countries where English is not the official and primary language must also take and receive an acceptable score on the TOEFL or IELTS.
Submit official TOEFL test score (Institution code: 1856) or official IELTS score (provide the Graduate School's mailing address to the testing company/center).

Typical Program (Course requirements are listed in semester credit hours)

The curriculum is designed with the working occupational therapist in mind. Coursework emphasizes practical application of the information taught. Projects are designed to reinforce learning of application to practice. Materials for completion of the courses can be obtained through the internet and required texts. The student must have consistent access to the internet. A high-speed connection (DSL, cable, satellite) is strongly recommended.

Two Tracks Are Available:

Certificate Only

On completion of the required coursework the student will be awarded a Graduate Certificate in Low Vision Rehabilitation by the University of Alabama at Birmingham and the student's name will appear in the commencement bulletin. A transcript of the coursework taken for the certificate will be available.

The curriculum for the certificate is offered online as web-based distance education for practitioners. Students accepted into the program begin the curriculum in January or August and complete one course per semester~~.~~. Because one course builds on another, students must take the courses in sequence. The final course requires that the student come to the UAB campus for a 3 day on campus intensive where the will work in small groups with instructors to demonstrate assessment and intervention skills. This is the only time the student is required to come to the UAB campus during the entire curriculum. Based on these requirements, course work for completion of the certificate will require 5 semesters.

Low Vision Rehabilitation Certificate/Postprofessional Master's Degree Program

Students may choose to make the low vision curriculum the major emphasis of the coursework for the Postprofessional Master's Degree offered by the Department of Occupational Therapy. Students completing the certificate program will only need to complete an additional 12 credits of coursework and 6 credits of research to receive the Postprofessional Master's Degree. Coursework for the Postprofessional degree is also online.

LOW VISION REHABILITATION CURRICULUM

The courses must be completed sequentially in the order listed below.

The list shows the course sequence for both student cohorts—one entering the program in the spring and the other entering in the fall.

Typical OT Curriculum Course Sequence

Fall Cohort

1st Fall Semester	OT 677 Foundations I	3 credits
1st Spring Semester	OT 679 Foundations II	3 credits
1st Summer Semester	OT 690 Foundations III	3 credits
2nd Fall Semester	OT 689 Foundations in Brain Injury	3 credits
2nd Spring Semester	OPEN students may take the OT 696 or 695 elective or a course in the post professional master's program	
2nd Summer Semester	OT 691 Foundations IV	3 credits

Spring Cohort

1st Spring Semester	OT 677 Foundations I	3 credits
1st Summer Semester	OT 679 Foundations II	3 credits
1st Fall Semester	OT 690 Foundations III	3 credits
2nd Spring Semester	OT 689 Foundations in Brain Injury	3 credits
	Students may also take the OT 696 or 695 elective	
2nd Summer Semester	OT 691 Foundations IV	3 credits

Total Credits 15 credits

For further information contact:

Program Coordinator
Occupational Therapy Low Vision Rehabilitation Certificate Program
UAB School of Health Professions
SHPB 355
1720 2nd Avenue South
Birmingham, AL 35294-1212
Telephone 205-975-6860
E-mail **lvrcert@uab.edu**
Web www.uab.edu/lowvision

Course Descriptions

Occupational Therapy (Entry Level OT)

605. **Therapeutic Skills**. Group theory and group dynamics are presented. Basic group and individual client-therapist interaction skills are introduced including: selecting a theory base, designing groups, writing group protocols, analyzing group activities, implementing specific group techniques, and evaluating progress of group members. Methods of establishing rapport, giving feedback, and employing therapeutic use of self are emphasized. 3 hours. PREREQUISITE: Admission to OT Program.

606. **Occupation Based Practice Models**. Introduction to fundamental concepts of occupational therapy frameworks, theory, philosophy, conceptual models and models of practice. 3 hours. PREREQUISITE: Admission to OT Program.

607. **Analysis of Occupational Performance**. Introduction to intervention techniques commonly used in occupational therapy practice; activity analysis and synthesis; application of typical growth and development in relationship to different age groups and populations. 3 hours. PREREQUISITE:

Admission to OT Program.

609. **Barriers to Occupational Performance**. Exposure to content specific to human disease processes, injuries, and developmental or inherited abnormalities within body systems that affect an individual's occupational performance. 3 hours. PREREQUISITE: Admission to OT Program.

610. **Mental Health Diagnoses Across the Lifespan.** Examines developmental and psychiatric conditions that result from disease, congenital, traumatic, environmental or social processes. Relationships among disease or disorder, impairments, activity limitations and participation restrictions are emphasized in terms of the impact upon occupational performance. 3 hours. PREREQUISITE: Admission to OT Program.

620. **Foundations of Occupation: A & P.** Designed to provide occupational therapy students a fundamental knowledge of human anatomy. An emphasis will be placed on the musculo-skeletal and peripheral nervous systems to enhance the understanding of conditions that will likely be encountered in the practice of occupational therapy. 4 hours. PREREQUISITE: Admission to OT Program.

623. **Foundations of Occupation: Neuroscience.** Advanced study of structure and function of central nervous system augmented with client examples. 3 hours. PREREQUISITE: Admission to the OT Program.

624. **Occupations of Infants, Children, and Adolescents**. This course addresses aspects of evaluation, intervention planning, implementation, and specific intervention strategies across diagnostic categories for children, birth through adolescents. Occupational therapy addresses client needs using a holistic approach that incorporates all aspects of an individual's lifestyle. This course will focus on components of occupational performance, and occupational performance issues related to adaptation and life satisfaction. 4 hours. PREREQUISITE: Admission to OT Program.

625. **Occupations of Adults and Older Adults I**. This course addresses aspects of evaluation, intervention planning, implementation, and specific intervention strategies across diagnostic categories in adult and elder rehabilitation. Occupational therapy addresses client needs using a holistic approach that incorporates all aspects of an individual's lifestyle. This course will focus on occupational areas of work play, and leisure addressing components of occupational performance and context s and how these areas affect occupational performance. 4 hours. PREREQUISITE: Admission to OT Program.

631. **Foundations of Occupation: Biomechanics**. Basic kinesiological principles and functional movement patterns of the human body during occupational performance. Study of principles and techniques for obtaining data about the status of the clients' joint range of motion and muscle strength. 4

hours. PREREQUISITE: Admission to OT Program.

632, 633. **Fieldwork Seminar I, II**. Forum for exchange of ideas and experiences; detailed case study/inservice on modality and intervention chosen from client census during previous term's Level I Fieldwork experience. 1 hour each. PREREQUISITE: Admission to OT Program.

634. **Seminar in Professional Readiness.** Forum for exchange of ideas and experiences; student, faculty, and alumni presentations on variety of topics. 2 hours. PREREQUISITE: Admission to OT Program.

653. **Using the Literature for Evidence Based Practice**. History of and rationale for evidence-based practice, introduction to typologies of evidence, search of databases, developing questions for occupational therapy practice, critiquing evidence, analyzing bodies of evidence developed from research questions, and integrating evidence into practice. 3 hours. PREREQUISITE: Admission to OT Program.

661. **Wellbeing and Health Through Occupation.** Course will evaluate and critique the evidence which supports the relationship between occupation, health promotion, lifestyle choices, and prevention of injury and disease, using occupational therapy models and approaches to practice while considering contexts. 3 hours.

662. **Enhancing Occupational Performance: Modalities**. This course will provide the opportunity to consider the occupational therapy process related to the design, fabrication, application, fitting, and training in the use of orthotics, prosthetics, and other modalities. Students will consider and apply the foundational knowledge, underlying principles, indications, contraindications, and precautions necessary for evidence-based practice. 3 hours. PREREQUISITE: Admission to OT Program.

663. **Promoting Occupations of Communities, Organizations, and Systems of Practice.** Course provides opportunities to evaluate and critique evidence for current and emerging areas of OT practice within organizations, systems, and ommunities. Students will evaluate current OT practice and identify potential service gaps. Students will critically discuss strategies for development of OT services emphasizing the business related aspects of working with arenas. 2 hours. PREREQUISITE: Admission to OT Program.

665. **Occupations of Adults and Older Adults II**. Intervention for the elderly from the perspective of the functional impact of age-related changes, evaluation and remediation of functional limitations and personal and environmental adaptations to promote continuing autonomy. 4 hours. PREREQUISITE:Admission to OT Program.

667. **Research Methods**. Research ethics, descriptive, exploratory and experimental design, basic statistical concepts, and discussion of various types of research to enable student to critically analyze and use scientific literature to improve practice. Emphasis will be placed on understanding components of the research report and concepts associated with judging of internal and external validity.3-4 hours. PREREQUISITE: Admission to OT Program

668. **Mental Health Practice in Adulthood.** Examines mental health conditions that result from disease, congenital, traumatic, environmental or social processes. Relationships among impairments, activity limitations and participation restrictions are emphasized in terms of the impact upon occupational performance. Evaluation, intervention planning, and intervention are studied. 4 hours. PREREQUISITE: Admission to OT Program.

673. **Engagement in Occupations Through Technology I.** Acquaints students with the following: theories relative to assistive technology, client centered practice, OT process relative to assistive technology, and certification and laws affecting assistive technology. Students will consider technology applications relative to the areas of occupation as referenced in the Framework for OT Practice, as well as elements of safety, education of clients and families, and the roles of OTs and OTAs in assistive technology practice. 3 hours.

674. **Engagement in Occupation Through Technology II**. This course is designed to acquaint the student with assessments used in evaluation of clients for assistive technology, specific intervention strategies, elements of safety related to assistive technology, the education of clients and families and other key people in the context of the user. The roles of OTs and OTAs in assistive technology practice will also be addressed. 3 hours. PREREQUISITE: Admission to OT Program.

675. **History and Theory of Occupation**. A historical survey of occupation, occupational meaning, and purposeful activity as used by occupational therapists in the study of the occupational nature of human beings across the life span. Students will gain an understanding of how leaders of the profession articulate occupational and therapeutic applications across time. 3 hours. PREREQUISITE: Admission to OT Program.

677. **Foundations in Low Vision Rehabilitation I.** Introduces the student to the field of low vision rehabilitation and addresses core knowledge needed for subsequent courses. Topics include settings and reimbursement for occupational therapy services, anatomy and physiology of the eye and visual system, medical conditions causing low vision, administration and interpretation of low vision exams, principles of optics, design and application of optical devices. 4 hours. PREREQUISITE: permission.

685. **Advanced Fieldwork Experience I.** Full-time supervised practice experience designed to develop entry-level professional skills consisting of a 3-month experience. 10 hours. PREREQUISITE: Admission to OT Program.

686. **Advanced Fieldwork Experience II**. Full-time supervised practice experience designed to develop entry-level professional skills consist of a 3-month experience. 10 hours. PREREQUISITE: Admission to OT Program.

688. **Occupation & Health: Groups & Communities**. This course will provide opportunities to reflect upon the facilitating and inhibiting nature of group and community settings and to consider the domains and contexts of both occupation and its influence on health, well-being, and lifestyle. 1-6 hours. PREREQUISITE: Admission to OT Program.

698. **Master's Level Non-Thesis Research**. Non-thesis research hours. (6 hours total). PREREQUISITE: Admission to OT Program.

LOW VISION / POSTPROFESSIONAL COURSES

642. **Research Design in OT.** First of three courses in which post professional master's students will design, implement, and document their final project. This course will review research methodologies appropriate for use by clinicians in practice; discuss sampling; data management; and IRB training and approval. 1-3 hours. (online). PREREQUISITE: permission.

643. **Data Analysis in OT Research.** Second of three courses in which post professional master's students will design, implement, analyze, and document their final project. This course addresses data management and data analysis using SPSS. 1-3 hours (online). PREREQUISITE: permission.

644. **Project Dissemination-Prof Writing and Presentation.** Third course in which post professional master's students will design, implement, and document their final project. This course will address documentation of project outcomes, writing for publication, and professional presentation. 1-3 hours (online). PREREQUISITE: permission.

647. **Leadership in Occupational Therapy**. To develop leadership competencies for the occupational therapist to enable understanding of personal development and organizational change dynamics. This course will explore aspects of leadership as they relate to the OT profession. 3 hours.

648. **Assistive Technology in Pediatric OT**. Assistive technology includes a broad range of devices, services, strategies, and practices used to compensate, remediate, or enhance functional performance of occupations for individuals with disabilities. This course will provide a foundation of knowledge and skills

for occupational therapists to critically analyze and apply assistive technology principles with pediatric clients. 3 hours.

653. **Using Lit: Evidence-Based Practice**. History of and rationale for evidence-based practice, introduction of typoloties of evidence, search of databases, developing questions for occupational therapy practice, critiquing evidence, analyzing bodies of evidence developed in response to research questions, and integrating evidence into practice. 3 hours.

658. **Foundations of Professional Education**. Introduction to occupational therapy postprofessional education. Concepts introduced include the World Health Organization's International Classification of Function, Occupational Therapy Practice Framework, the American Psychological Association writing framework, and the continuing competency aspects of the American Occupational Therapy Association's Professional Development Tool. 4 hours (online). PREREQUISITES: permission.

677. **Foundations in Low Vision Rehabilitation I.** Introduces the student to the field of low vision rehabilitation and addresses core knowledge needed for subsequent courses. Topics include settings and reimbursement for occupational therapy services, anatomy and physiology of the eye and visual system, medical conditions causing low vision, administration and interpretation of low vision exams, principles of optics, design and application of optical devices. 3-4 hours. PREREQUISITE: permission.

679. **Foundations in Low Vision Rehabilitation II**. Building on the information provided in OT 677, this course addresses specific treatment strategies to enhance occupational performance in persons with visual impairment. Students learn to use information obtained from evaluations to design appropriate treatment interventions. Topics covered: assistive technology and computer modifications, reading, writing, and environmental assessment/modification. 3-4 hours. PREREQUISITE: permission.

689. **Foundations in Treatment of Visual Impairment from Brain Injury**.This course addresses evaluation and intervention for adults experiencing occupational limitations secondary to visual processing impairment from acquired brain injury. Topics include neuroanatomy of the visual processing system, evaluation and intervention for deficits in visual acuity, visual field deficits, evaluation and intervention for deficits in oculomotor function, and evaluation and intervention for deficits in visual attention and cognitive processing. 3 hours. PREREQUISITE: permission.

690. **Foundations in Low Vision Rehabilitation III**. Building on the information provided in OT 679, this course teaches students to apply intervention strategies to enhance occupational performance. Topics include: completing activities of daily living with and without vision, functional mobility, diabetes self management, and driving and transportation. 3 hours. Prerequisite: permission of instruction.

691. **Foundations in Low Vision Rehabilitation IV**. As the final course in the curriculum sequence, students demonstrate their ability to apply the knowledge gained in the previous foundation courses to selecting and interpreting evaluations and designing interventions for adults with various impairments. Content provided: review and synthesis of key evaluation and intervention principles for working with persons with age-related vision impairment and brain injury; practicum in diabetes self-management, functional mobility and assistive technology; influence of policy and regulation on practice; occupational justice and advocacy; developing and marketing low vision rehabilitation programs within the health care system; professional development and continuing professional competence. 3 hours

692. **Directed Readings**. Readings for in depth study of specialized topics. 1-3 hours. PREREQUISITE: permission.

696. **Evaluation and Treatment of Children with Visual Impairments**. Taught by Linda Nobles, MS, OTR/L, this course addresses issues related to working with children with visual impairment. Topics covered: medical conditions causing vision loss in children including optical and cortical visual impairment; evaluation techniques, optical devices, assistive technology, treatment strategies, and working with parents and school systems. 2 hours (online). PREREQUISITIES: permission.

Physical Therapy (DPT)

Degree Offered: D.P.T.

Director (D.P.T.): Dr. Sharon Shaw

Phone: (205) 934-3566

E-mail: sshaw@uab.edu

Web site: **www.uab.edu/pt**

Primary Faculty

C. Scott Bickel, Associate t Professor (Physical Therapy); Skeletal Muscle Function, Electrotherapeutics

Jennifer Braswell Christy Associate Professor (Physical Therapy); Pediatrics; Vestibular Dysfunction

Diane Clark, Assistant Professor (Physical Therapy); Wound Care; Health Promotion

Jo Ann Clelland, Professor Emerita (Physical Therapy); Pain Management

Betty G. Denton, Associate Professor Emerita (Physical Therapy); Curriculum Development

Cali Fidopiastis, Assistant Professor; Virtual Rehabilitation, Brain-Computer Interface, Test and Measurements

Matthew Ford, Associate Professor (Physical Therapy); Motor Control Dysfunction

Cecilia Graham, Associate Professor (Physical Therapy); Education, Acute Care

Cheryl J. Knowles, Associate Professor Emerita (Physical Therapy); Cardiopulmonary Physical Therapy

Donald Lein, Assistant Professor (Physical Therapy); Clinical Education

John Lowman, Assistant Professor (Physical Therapy); Cardiopulmonary Physical Therapy

John McCarthy, Associate Professor (Physical Therapy); Exercise Physiology

David M. Morris, Associate Professor (Physical Therapy); Aquatic Physical Therapy,

Patrice Murphy, Assistant Professor (Physical Therapy); Developmental Disabilities, Orthotics

William Ogard, Assistant Professor (Physical Therapy); Sensory Function of Anterior Cruciate Ligament, Proprioception of Knee Joint, Anatomy, Function of Lumbar Musculature

Claire Peel, Professor (Physical Therapy); Exercise Physiology, Cardiopulmonary Therapeutics, Geriatric Rehabilitation

Patty Perez, Assistant Professor (Physical Therapy); Orthopedic Rehabilitation

Sharon E. Shaw, Associate Professor (Physical Therapy); Health Outcomes Assessment, Neurological Rehabilitation

Program Information

The Doctor of Physical Therapy program is a course of study for students who hold baccalaureate degrees in fields of study other than Physical Therapy. Completion of the program after nine semesters leads to a Doctor of Physical Therapy (DPT) degree and serves as initial preparation for practice as a physical therapist.

Doctor of Physical Therapy (D.P.T.)

Physical therapists provide services to patient/clients who have body structure and function impairments, activity limitations, participation restrictions, or changes in physical function and health status resulting from injury, disease, and other causes. Physical therapists also address risk and provide prevention services and promote health, wellness, and fitness. Physical therapists interact and practice in collaboration with a variety of professionals. Finally physical therapists also function in consultative, education, administrative and supervisory roles in many different types of practice, research, and education settings.

Accreditation: The program is accredited by the Commission on Accreditation in Physical Therapy Education.

Credentials Conferred: The Doctor of Physical Therapy degree is awarded by the University of Alabama at Birmingham.

License : Graduates are eligible for the physical therapist licensure examination. Note that state law regulates the practice of Physical Therapy; contact a specific state's Board of Licensure for Physical Therapy to obtain information on that state's eligibility requirements.
http://www.fsbpt.org/LicensingAuthorities/index.asp

Length of Study: Nine semesters.

Program Entrance Date: Spring semester.

Application Procedure: This program participates in the Physical Therapist Centralized Application Service (PTCAS). Please consult **www.ptcas.org** for more information regarding specific PTCAS application requirements, procedures and fees. The PTCAS application needs to be completed by December 3, 2012 for the class beginning January, 2014. Applicants should send all application materials including GRE scores (use code 7801) directly to PTCAS. PTCAS will verify the application information and send completed applications to the program.

Requirements for Admission: The applicant must hold a baccalaureate degree from an accredited college or university within the United States in a field other than physical therapy. Acceptance will be based on the student's academic ability and aptitude for a career as a physical therapist. The candidate is expected to satisfy the following requirements:

Complete the PTCAS application by December 3, 2012.
75% of prerequisite courses must be completed by the end of the fall semester of the year of application.

- For example, applicants submitting their application on December 3, 2012 must have 75% of prerequisite courses completed by the end of the fall semester 2012...

Complete at least 40 hours of documented observation of physical therapy. Various settings are recommended. Documentation should be submitted to PTCAS by the December 3rd deadline.
Submit three letters of recommendation to PTCAS.
Letter 1: Written by a physical therapist who has interacted with the applicant for at least 20 hours in a clinical setting.
Letter 2: Written by a physical therapist who has interacted with the applicant for at least 20 hours in a clinical setting.
Letter 3. Written by a professor with whom the applicant had significant interaction in an academic setting..

Complete the GRE and have scores sent to PTCAS (code 7801).
Have a minimum 3.0 (A=4.0) overall, prerequisite and last 60 semester hours grade point average. For prerequisite courses, no grade lower than a C will be accepted.
If invited, complete a personal interview with the Department of Physical

Students who are **accepted** into the UAB Doctor of Physical Therapy program must:

Complete the UAB Graduate School application to include the Graduate School fee.
Complete the UAB medical history questionnaire and physical.
Provide proof of required immunizations, and receive satisfactory screening by the UAB Medical Center Student Health Service.
Send all official transcripts to the UAB Graduate School.
Complete a criminal background check before the first semester as specified by the Department of Physical Therapy in order to participate in clinical education.
State law regulates the practice of Physical Therapy. Therefore, applicants are encouraged to review the nonacademic eligibility requirements for licensure to practice physical therapy upon completion of the program. These may be obtained from each individual state's Board of Licensure for Physical Therapy.
http://fsbpt.org/LicensingAuthorities/index.asp

Variations in these requirements are considered. In instances where applicants do not meet the principle requirements for admission, they may be admitted on probation with the approval of the Graduate School Dean. Such students must establish themselves in good standing by achieving not less than a B average

by the time they have completed 1 term of approved work taken at UAB for graduate credit.

Program Prerequisites–UAB Equivalents

(Course requirements are listed in semester credit hours)

Arts and Humanities
English Composition–EH 101, 102 (6)

Social and Behavioral Sciences
Psychology (9)

Natural Sciences and Mathematics
Precalculus with Trigonometry–MA d 106 (3)

Statistics (must be taken in Math, Psychology, or Sociology)–MA 180, PY 214, or SOC 110 (3-4)

Physics*—PH 201/211 lab, 202/212 lab or PH 221/231 lab, 222/232 lab** (8)

General Chemistry for science majors with labs*—CH 115/116 lab, 117/118 lab (8)

Biology including Human or Mammalian Physiology*—BY 116 or 309 (16)

Medical Terminology - AHS 350 (2-3). Online courses are accepted.

**For these prerequisite courses, credit older than ten years from the application deadline must be validated by examination or other appropriate mechanism.*

***The physics course sequence must be designed for science majors and include laboratory sessions. A minimum of 8 semester hours is required. The following topics must be studied: mechanics, heat, electricity and magnetism, wave motion and sound, and light.*

It is strongly recommended that applicants take the following courses: practical reasoning or logic course, biomechanics or kinesiology and upper level biology (physiology).

Essential Requirements: Fundamental tasks, behaviors, and abilities necessary to successfully complete the academic and clinical/residency requirements of the program and to satisfy licensure/certification requirements, if any, have been outlined and are available upon request from the academic program office. Students requesting disability accommodations must do so by filing a disability accommodation request in writing with the academic program office.

Typical Program

(Course requirements are listed in semester credit hours)

First Year

Spring

PT 700 Human Gross Anatomy I (4)

PT 702 Functional Anatomy (3)

PT 730 Essentials of Human Physiology (3)

PT 711 PT Examination I (2)

PT 713 PT Intervention I (3)

PT 760 PT Professional Practice I (2)

Summer

PT 701 Human Gross Anatomy II (2)

PT 712 PT Examination II (3)

PT 720 Pathology & Pharmacology for Movement Disorder I (3)

PT 731 Human Performance Physiology (3)

PT 770 Clinical Education I (1)

PT 790 Scientific Inquiry I (1)

PT 791 Scientific Inquiry II (1)

Fall

PT 706 Neuroscience I (4)

PT 704 Analysis of Human Movement (3)

PT 714 PT Intervention II (2)

PT 715 PT Intervention III (3)

PT 721 Pathology & Pharmacology for Movement Disorder II (3)

PT 771 Clinical Education II (2)

PT 792 Scientific Inquiry III (1)

Second Year

Spring

PT 705 Human Movement Dysfunction (4)

PT 707 Neuroscience II (3)

PT 740 PT Management of Musculoskeletal Dysfunction I (5)

PT 743 PT Management of Cardiopulmonary Dysfunction (3)

PT 772 Clinical Education III (2)

PT 798 Scholarly Activity Project (1-3)

Summer

PT 744 PT Management of Neuromuscular Dysfunction I (4)

PT 761 PT Professional Practice II (3)

PT 793 Scientific Inquiry IV (1)

PT 798 Scholarly Activity Project (1)

Fall

PT 741 PT Management of Musculoskeletal Dysfunction II (5)

PT 746 PT Management of Neuromuscular Dysfunction II (4)

PT 762 PT Professional Practice III (3)

PT 799 Scholarly Activity Project (1)

Third Year

Spring

PT 763 PT Professional Practice IV (2)

PT 764 PT Professional Practice V (2)

PT 773 Clinical Education IV (8)

Summer

PT 774 Clinical Education V (9)

Fall

PT 775 Clinical Education VI (9)

Total Credit Hours for Program: 119

Additional Information

For detailed information, contact Betsy Coleman, Physical Therapy Department, School of Health Professions, SHPB, Room 333, 1705 University Boulevard (mailing address: SHPB 333, 1720 2nd Avenue South), Birmingham, Alabama 35294-1212.

Telephone 205-934-4363

E-mail

Course Descriptions

Physical Therapy (PT)

700, 701. **Human Gross Anatomy I, II**. A study of the ross anatomical structure of the human body includes e limbs, back, abdominal wall and cavity. Specific emphasis includes regional study of the relationships between musculoskeletal, nervous, and vascular systems, joint structure, cardiovascular and pulmonary systems, and surveys of selected viscera PT 700-4 hours; PT 701-2 hours.

702. **Functional Anatomy**. Integrated study of anatomy, kinesiology, muscle biology, and biomechanics to develop an understanding of and ability to analyze normal and pathologic human movement. Includes palpation and surface anatomy. 3 hours.

704. **Analysis of Human Movement**. Study of human movement through an examination of the movement patterns during common motor skills (eg: walking). The kinematics and kinetics related to movement will be studied across the lifespan. 3 hours

705. **Human Movement Dysfunction**. Study of human movement dysfunction including recovery processes related to injury, impairments associated with pathology and behavior and kinematic/kinetic descriptions of movement dysfunction related to cardiopulmonary, musculoskeletal, and neuromuscular pathology across the lifespan. 4 hours

706. **Neuroscience I** . A study of structures and functions of the human nervous system with emphasis on sensory/motor function. 4 hours

707 **Neuroscience II Continuation of 706.** Study of the theories of motor control and motor learning will serve as a foundation for the understanding how the CNS is organized in relation to human movement. 3 hours

711. **Physical Therapy Examination I.** Introduction to the physical therapy examination process which includes history taking, systems review, and tests and measures. Emphasis will be placed on systems review and medical screening for each of the major systems. Overview of the major types of tests and measures employed by physical therapists and the type of data generated with a focus on self-care for patient. 2 hours.

712. **Physical Therapy Examination II**. Continuation of Physical Therapy I with focus on knowledge and skills needed to test and measure strength, range of motion, and posture. 3 hours.

713. **Physical Therapy Intervention I.** Introduction to the components and process of physical therapy intervention. Emphasis on beginning communication & documentation skills and basic procedural

interventions of patient transfers, gait with assistive devices, superficial physical agents, massage, and passive range of motion. Overview of major categories of procedural interventions utilized by physical therapists. 3 hours

714. **Physical Therapy Intervention II**. This course covers procedures and techniques for the design and implementation of fundamental therapeutic exercise. By recognizing impairments and in body function and structure and activity limitations that are amenable to physical therapy, the students will utilize therapeutic exercise interventions for prevention and rehabilitation of movement dysfunction and disability. 2 hours

715. **Physical Therapy Intervention III**. The study and use of knowledge and skills needed to select and use both electrodiagnostic and electrotherapeutic modality interventions for various impairments and functional limitations. Emphasis will be placed on integrating electrical evaluation, electrical and deep heat therapy with previously learned examination, evaluation, and intervention skills. An overview of integument system repair and the management of chronic wounds will be discussed with an emphasis on examination, clinical decision making, and intervention. 3 hours

720, 721. **Pathology and Pharmacology for Movement Disorders I, II**. Basic principles of pathology and pharmacology. Medical and surgical management of disorders involving the cardiovascular/pulmonary, musculoskeletal, neuromuscular, endocrine, integumentary, genitourinary, and GI systems. For each disease discussed, the diagnosis, medical, surgical, and pharmacological management will be included, as appropriate. PT 720 – 3 hours, PT 721-3 hours.

730. **Essential of Human Physiology** . Fundamental principles and concepts of human physiology are covered regarding cell physiology, the cardiovascular, endocrine, gastrointestinal, pulmonary, renal, and skeletal muscle systems, , as well as thermoregulation of the body. Both cellular and systemic issues are addressed with an emphasis on a mechanistic and integrative approach to understanding function. 3 hours.

731. **Human Performance Physiology.** Course provides fundamental knowledge about the adaptability of human physiological systems in meeting a range of exercise demands. Areas covered include energy transfer during rest and exercise, physiologic and performance adaptations, exercise prescription for healthy adults, and body composition. Research evidence regarding how exercise and physical activity impact health, wellness, and disease is included. 3 hours.

740, 741. **PT Management of Musculoskeletal Dysfunction I, II**. Application of biological and physical sciences in understanding musculoskeletal disorders. Diagnosis of common musculoskeletal

dysfunctions; clinical decision making concerning treatment and prevention of musculoskeletal disorders. Medical and surgical diagnostic and treatment procedures with implications for rehabilitation. Focus for one course is on the lower quarter and the thoracic spine; focus of the other course is on the upper quarter. PT 740 – 5 hours, PT 741 – 5 hours

743. **PT Management of Cardiovascular/Pulmonary Dysfunction**. Physical therapy examination, evaluation, diagnosis, prognosis, and intervention for patients with primary and secondary disorders involving the cardiovascular/pulmonary system. 3 hours.

744, . **PT Management of Neuromuscular Dysfunction I,I**. Application, analysis, and synthesis of principles of neurophysiologic rehabilitation in physical therapy examination, evaluation, diagnosis, and intervention. PT 744 – 4 hours,

746. PT Mgt. Neuromuscular Dysf II. Continuation of PT 744. Application, analysis and synthesis of principles of neurophysiologic rehabilitation in physical therapy examination, evaluation, diagnosis, prognosis and intervention4 hours

760. **PT Professional Practice I.** Introduction to the profession of physical therapy, including history, APTA, and scope of practice. Introduction to legal, ethical and other regulatory mechanisms that guide the practice of physical therapy. Presentation of cultural diversity issues related to physical therapy practice. 2 hours.

761. **PT Professional Practice II**. Synthesis and application of regulatory mechanisms, legal mandates and ethical principles and theories to issues facing the physical therapy student and the physical therapist functioning in a multifaceted role; values clarification and decision making related to current professional issues. Strategies for dealing with diverse cultures and conflict. Utilization of documentation strategies to promote effective physical therapy practice and payment3 hours

762. **PT Professional Practice III**. Forces contributing to the health care environment and the effects of this environment on physical therapy practice, research and education. Concepts of health promotion (including wellness and patient education) and the role of the physical therapist in promoting healthy lifestyles in the health care and community settings. Theoretical basis for health behaviors and application of theories to physical therapy practice. Concepts of consultation, program planning, implementation, and evaluation applied to health promotion-oriented physical therapy programs. 3 hours

763. **PT Professional Practice IV**. Study of management and supervisory principles and current issues related to physical therapy practice: Practical concepts of marketing, organizational structure, fiscal

management, facility planning, design and entrepreneurship. 2 hours

764**. PT Professional Practice V: Capstone Experience**. Integration of all previous coursework applied to reflection of the scope of PT practice: direct patient care, professional growth/development, professional issues, education, consultation, evidence based practice (EBP), communication, cultural competency, and promotion of the profession in achieving Vision 2020. Development and presentation of an individual portfolio that reflects core values, personal & professional growth and accomplishments, and appropriate plans for future professional development. 2 hours

770. **Clinical Education I.** Part-time clinical experience. Supervised clinical education in basic patient care skills and an introduction to practice issues related to physical therapy. 1 hour

771 **Clinical Education II** Part-time clinical experience. Continuation of PT 770. 2 hours

772. **Clinical Education III**. Part-time clinical experience. Continuation of PT 771. 2 hours

773, **Clinical Education IV,**. 10 week, full-time supervised clinical education in a clinical setting to provide student with the opportunity to apply previously acquired knowledge & skill to client care. Emphasis is on examination and evaluation skills; intervention techniques and treatment planning (including care of problems related to musculoskeletal, neuromuscular, cardiovascular/pulmonary and integumentary systems). Available experiences in supervision, consultation, research, management, and teaching are also included.These students have completed all academic course work and is the first full-term clinical experience for these students. 8 hours

774. **Clinical Education V** Continuation of PT 773. 9 hours

775 **Clinical Education VI.** 9 hours.

790. **Scientific Inquiry I**. This is the first course in the research series for physical therapy students. Students will be introduced to sources of bibliographic information and database searching, annotated bibliographies, critical review of scientific literature, and beginning concepts of the application of research to clinical practice. 1 hour

791. **Scientific Inquiry II**. This course combines concepts of measurement principles, experimental design, qualitative, survey outcomes research and a review of basic statistical concepts that will prepare the graduate to critically analyze and use the scientific literature to improve clinical practice. Emphases will be placed on understanding the components of a research report and the concepts associated with judging quality of research design as applied to clinical practice. 1 hour

792. **Scientific Inquiry III**. Emphasis will be placed on the assessment of research literature in Physical Therapy and the application of research findings to clinical practice. Additionally, advanced clinical research designs will be discussed. 1 hour

793. **Scientific Inquiry IV**. This is the final course in the Scientific Inquiry Series. The emphasis will be placed on peer review and professional presentation of scholarly work. 1 hour

798. **Scholarly Activity Project**. Implementation of project activities with data collection, analysis, and preparation of manuscript of scholarly activity project. Student and mentor work together to identify specific project components to be completed during each specific term the course is taken. 1 hour

799. **Scholarly Activity Project:** Implementation of project activities with data collection, analysis, and preparation of manuscript of scholarly activity project. Student and mentor work together to identify specific project components to be completed during each specific term the course is taken. 1 hour

Physical Therapy (PTGR)

747. **Seminar in Interdisciplinary Services for Infants, Children, and Youth with Developmental Disabilities**. Synthesis of team-based approaches to intervention for infants, children, and youth with known or suspected disabilities. Focus on legislation and policy, team processes and practices, and family-centered applications. Open to upper level students in disciplines which have roles in service provision for the described population. Prerequisite: acceptance into the traineeship program, or consent of department. 1-2 hours

Rehabilitation Science (Ph.D.)

Degree Offered:	Ph.D.
Directors:	Dr. David Brown
Phone:	(205) 934-3566
E-mail:	dbrownpt@uab.edu
Web site:	**http://www.uab.edu/rsphd**

Faculty

C. Scott Bickel, Assistant Professor (Physical Therapy); Skeletal Muscle Function, Electrotherapeutics

Jennifer Braswell Christy Assistant Professor (Physical Therapy); Pediatrics; Vestibular Dysfunction

Diane Clark, Assistant Professor (Physical Therapy); Wound Care; Health Promotion

Stephanie C. DeLuca, Assistant Professor (Occupational Therapy); Research and Development of New and Efficacious Treatment Techniques for Children with Neuromotor Disorders.

Cali Fidopiastis, Assistant Professor, (Physical Therapy); Virtual Rehabilitation, Brain-Computer Interfaces, Tests and Measurements

Kathleen Foley, Assistant Professor (Occupational Therapy); Physical Dysfunction, Gerontology, Pathophysiology

Matthew Ford, Associate Professor (Physical Therapy); Motor Control Dysfunction

Cecilia Graham, Associate Professor (Physical Therapy); Education, Acute Care

Gavin Jenkins, Assistant Professor (Occupational Therapy); Assistive Technology and the Built Environment

Donald Lein, Assistant Professor (Physical Therapy); Clinical Education

John Lowman, Assistant Professor (Physical Therapy); Cardiopulmonary Physical Therapy

John McCarthy, Associate Professor (Physical Therapy); Exercise Physiology

David M. Morris, Associate Professor (Physical Therapy); Aquatic Physical Therapy

Patrice Murphy, Assistant Professor (Physical Therapy); Developmental Disabilities, Orthotics

William Ogard, Assistant Professor (Physical Therapy); Sensory Function of Anterior Cruciate Ligament, Proprioception of Knee Joint, Anatomy, Function of Lumbar Musculature

Claire Peel, Professor (Physical Therapy); Exercise Physiology, Cardiopulmonary Therapeutics, Geriatric Rehabilitation

Patty Perez, Assistant Professor (Physical Therapy); Orthopedic Rehabilitation

Jan A. Rowe, Interim Chair and Associate Professor (Occupational Therapy); , Tourette syndrome clinic: Feeding and Swallowing of Infants and Young Children

Sharon E. Shaw, Associate Professor (Physical Therapy); Health Outcomes Assessment, Neurological Rehabilitation

Laura K. Vogtle, Professor (Occupational Therapy); Pediatrics, Research Methods, Program Evaluation, Outcomes Research

Hon Yeun, Professor and Director of Research

Program Information

Ph.D. in Rehabilitation Science

The Ph.D. in Rehabilitation Science program is an interdisciplinary program offered by **The Department of Occupational Therapy** and **The Department of Physical Therapy** at the School of Health Professions. This exciting program is designed to prepare graduates to become*:

- Academicians, scholars, scientists and researchers in education, health care, industry, and government institutions.
- Consultants to individuals, communities, and governments.

The goal of the Program is to prepare graduates to have the following skills:

- Design and implement research studies that will contribute to the knowledge base of rehabilitation science.
- Design and deliver educational courses related to rehabilitation.
- Translate innovative rehabilitation research findings into practice so as to advance the field of rehabilitation science.

*The aim of this program is to prepare candidates to become leaders in teaching and research within the field of Rehabilitation Science. However, this is not a clinical training program. . Applicants planning to become occupational therapists or physical therapists should visit the following websites to pursuit training in these two professions: **www.uab.edu/ot** or **www.uab.edu/pt**.

Application Procedure

Received by UAB Graduate School
511 HUC; 1400 University Boulevard

1530 3rd Avenue South
Birmingham, Alabama 35294-1150

- Complete and submit online Graduate School application
- Submit application fee payment - Domestic: $45.00
- Request one (1) official transcript to be mailed by the issuing institution to the UAB Graduate School
- Three (3) letters of recommendation are required. Please ask the individuals from whom you request references to submit them online via the Apply Yourself system. Electronic submission is the preferred method. However, if your referees prefer to mail a recommendation letter, it should be mailed to the address of the department or program to which you are applying.

Minimum Requirements for Admission

- Note that each application will be reviewed by the Admission Committee to identify individuals with strong commitment and aptitude to perform research related to Rehabilitation Science, along with strong academic preparation and professional-leadership potential.
- Undergraduate or graduate degree in occupational or physical therapy, engineering, exercise science, neuroscience, medicine, nursing, or other health related professions.
- Recommended minimum combined Graduate Record Exam (GRE) score of 1100
- Recommended minimum GPA 3.0/4.0 in all previous coursework
- Three strong evaluation references, with at least one from a research lab mentor, and one from an academic source.
- With the written essay, provide evidence of appropriate goals of study, professional growth and commitment to research, with special emphasis on interest in research that is being conducted at UAB.
- Interview with faculty that shows passion and commitment to research and professional growth in Rehabilitation Science.

For further information contact:

David Brown, PT, Ph.D.
Department of Physical Therapy
205-934-3566
dbrownpt@uab.edu

Course Descriptions

Rehabilitation Science (RHB)

780. **Philosophy and theory in Rehabilitation Science**. Interdisciplinary discussion of historical, current and emerging theories, principles, concepts, and models of rehabilitation science. 3 hours.

781. **Critical Review of Rehabilitation Science Research**. Interdisciplinary course preparing students to critically review and analyze research practices in the literature of rehabilitation science. 3 hours.

782. **Tests and Measurements in Rehabilitation Science Research**. Interdisciplinary in-depth study of current tests and measures used in rehabilitation science. 3 hours.

783. **Research Design in Rehabilitation Science Research**. A detailed overview of research methodologies used in rehabilitation science. 3 hours.

789. **Rehabilitation Science Seminar**. Varied discussion of rehabilitation science topics to help students explore research questions in preparation for their dissertation. 2 hours.

798-799. **Dissertation Research**. 24 hours

Surgical Physician Assistant Studies (M.S.P.A.S.)

Degree Offered:	M.S.P.A.S.
Director:	Patricia R Jennings DrPH, PA-C
Phone:	(205) 934-3209
E-mail:	**AskCDS@uab.edu**
Web site:	**www.uab.edu/surgicalpa**

Faculty

Donald Reiff, Medical Director; Trauma

John Baddley, Associate Medical Director; Infectious Disease

Kara Caruthers, Assistant Professor; Emergency Medicine

William R. Drace, Assistant Professor; Director of Admissions; Cardiothoracic Surgery

Paul M. Harrelson, Assistant Professor, Associate Program Director; Pain Management

Patricia R. Jennings, Professor; Infectious Diseases.

Kristopher Maday, Assistant Professor; Trauma

Kelley Swatzell, Assistant Professor; Public Health

General Information

Physician Assistants (PAs) are valuable members of a multidisciplinary healthcare team. The profession was established in 1965 to help physicians provide healthcare services to underserved and rural populations. While the profession remains committed to its historical mission, PAs are now employed in almost all medical and surgical specialties.

PAs are healthcare professionals licensed to practice medicine under the supervision of a physician. Individual state practice laws and hospital bylaws define the scope of practice and prescribing authority of physician assistants. In general, most states authorize PAs to prescribe non-controlled substances and perform any task delegated by a supervising physician.

To be eligible for licensure, PAs must graduate from an accredited physician assistant program and pass the Physician Assistant National Certification Examination (PANCE). To maintain licensure, PAs must complete 100 hours of continuing medical education credits every two years and pass the Physician Assistant National Recertification Examination (PANRE) every six years. PAs may obtain additional training through postgraduate residency programs in subspecialty areas, but these programs are not required for licensure or practice in subspecialty areas.

The mission of the UAB Surgical Physician Assistant Program is to provide qualified individuals with the knowledge, skills, and judgment needed to assist physicians in the care of patients in surgical, acute-care, and medical settings. While surgical physician assistants function under the direction of the physicians, they are capable of performing selected tasks autonomously.

Accreditation:

The Surgical Physician Assistant Program is accredited by the Accreditation Review Commission on Education for the Physician Assistant, Inc. (ARC-PA).

Credentials Conferred:

Diploma–The Master of Science in Physician Assistant Studies (MSPAS) degree is awarded by the University of Alabama at Birmingham.

Professional Certification:

Graduates of the UAB SPA program are eligible to take the Physician Assistant National Certifying Examination (PANCE) sponsored by the National Commission on Certification of Physician Assistants to become a certified PA

Essential Requirements

Fundamental tasks, behaviors, and abilities necessary to successfully complete the academic and clinical requirements of the program and to satisfy licensure/certification requirementshave been outlined and are available upon request from the academic program office. Students requesting disability accommodations should contact UAB Disability Support Services (DSS) at 205-934-4205 or visit DSS at 516 Hill University Center or http://students.uab.edu/dss.

Program Curriculum:

Course requirements are listed below with semester credit hours in parentheses

Didactic Curriculum

Fall Semester

PA 601 Human Gross Anatomy (4)

PA 602 Medical Physiology (4)

PA 605 Pathology (3)

PA 610 Clinical Laboratory Medicine (3)

PA 615 Introduction to the PA Profession (1)

Spring Semester

PA 603 Pharmacology I (3)

PA 606 Clinical Medicine I (4)

PA 608 Surgical Disease I (3)

PA 611 History and Physical Examination I (3)

PA 613 Surgical Techniques (3)

PA 616 Electrocardiography (1)

Summer Semester

PA 604 Pharmacology II (3)

PA 614 Operating Room Techniques (2)

PA 619 Fundamental of Clinical Research (3)

AHS 530 Health Admin. & Management (3)

Fall Semester

PA 607 Clinical Medicine II (6)

PA 609 Surgical Disease II (3)

PA 612 History and Physical Examination II (3)

PA 617 Applied Behavioral Medicine (2)

PA 618 Risk Management (1)

PA 620 Analysis of Professional Literature (2)

PA 634 Simulation Lab (1)

Clinical Curriculum

Consists of 12 clinical rotations PA 621 – PA 632 (4 credits each) plus Senior Seminar I, II & III and Masters Research Project Presentation. Of the 12 clinical rotations, 10 are required and 2 are electives. (One required clinical rotation in either CVS, Orthopedics, or General Surgery will be an 8 week rotation.)

Spring Semester

PA 621 Clinical Service I (4)

PA 622 Clinical Service II (4)

PA 623 Clinical Service III (4)

PA 624 Clinical Service IV (4)

PA 638 Senior Seminar I (3)

Summer Semester

PA 625 Clinical Service V (4)

PA 626 Clinical Service VI (4)

PA 627 Clinical ServiceVII (4)

PA 628 ClinicalServiceVIII (4)

PA 639 Senior Seminar II (3)

Fall Semester

PA 629 Clinical Service IX (4)

PA 630 Clinical Service X (4)

PA 631 Clinical Service XI (4)

PA 632 Clinical ServiceXII (4)

PA 640 Senior Seminar III (2)

PA 698 Presentation of Research Project (1)

Clinical Rotations (PA 621-632)

10 Required Clinical Rotations

- Cardiovascular Surgery (4)
- Emergency Medicine (4)
- General Surgery (4)
- Inpatient Medicine (4)
- Obstetrics and Gynecology (4)
- Outpatient Medicine (4)
- Orthopedics (4)
- Pediatrics (4)
- Psychiatry / Geriatrics (4)

2 Elective Clinical Rotations

- Neurosurgery
- Outpatient Surgery
- Plastic Surgery
- Renal Transplantation
- Surgical Oncology
- Thoracic Surgery
- Trauma Surgery

***Admission* Requirements:**

- Baccalaureate degree from a regionally-accredited college/university
- Graduate Record Examination (GRE) General Test scores from the Verbal, Quantitative and Analytic sections. Applicants with advanced degrees whose GRE scores are older than 5 years (the time limit that ETS will send scores) can send reports from previously attended graduate programs.
- A minimum cumulative undergraduate grade point average of at least 3.0 (A = 4.0)
- A minimum GPA of 3.0 in natural science courses
- A minimum cumulative grade point average of 3.0 in the program prerequisite courses, with a minimum grade of C in each
- Technical ability to complete the program (see Essential Requirements and Technical Standards)
- Interview with faculty
- Satisfactory screening on health data questionnaire by the UAB Medical Center Student Health Service.
- The following prerequisites:

  3-4 semester hours of biology I, lab preferred (UAB BY 123)

  3-4 semester hours of biology II, lab preferred (UAB BY 124)

  3-4 semester hours of microbiology, lab preferred (UAB BY 261 or BY 271)

  3-4 semester hours of human anatomy, lab preferred (UAB BY 115)

  3-4 semester hours human physiology, lab preferred (UAB BY 116 or BY 409)

  8-9 semester hours of general chemistry, labs preferred,(UAB CH 115, 116, 117 & 118 preferred; CH 105, 106, 107, 108 accepted)

  3-4 semester hours of statistics (upper level, population, and/or health-related with lab preferred, UAB PY 214, PY 217, AHS 360 preferred, MA 180 accepted)

  3 semester hours of general psychology (UAB PY 101 or PY 201)

  3 semester hours of developmental psychology (UAB PY 212)

  3 semester hours of abnormal psychology (UAB PY 218)

Applicants are evaluated on the following criteria:

Academics - Overall GPA, Science GPA, Prerequisite Grades and GRE Scores.

Clinical Experience - Although not required for admission into the program, experience in health care settings, (providing direct patient care and/or surgical experience) is considered in the application score.

Personal statement - Applicants are evaluated on the quality of their personal statement.

Letters of support - Three (3) letters of support are reviewed and considered.

The PA Program is committed to recruiting and matriculating minority and disadvantaged students for careers as physician assistants.

Listed below are the midrange scores of students admitted into the program. These scores are provided so that applicants can assess their competitiveness.

	Old GRE Verbal Score	New GRE Verbal Score	GRE Verbal % Score	Old GRE Quantative Score	New GRE Quantative Score	GRE Quantative % Score	GRE Analytical Score	Science GPA	Overall GPA
25th Percentile	440	149	40%	580	147	31%	3.5	3.38	3.51
Mean	495	153	57%	650	151	48%	4.0	3.50	3.60
75th Percentile	530	155	65%	710	155	64%	4.0	3.75	3.79

Application Procedures:

This program participates in the Central Application Service for Physician Assistants (CASPA). Please consult **www.caspaonline.org** for more information regarding specific CASPA application requirements, procedures and fees. The CASPA application needs to be completed by September 1 of the year prior to admission. Applicants should send all CASPA application materials (except official GRE scores) directly to CASPA. CASPA will verify the application information and send completed applications to the program. Applicants should make arrangements to send official GRE scores directly to the UAB Graduate School. The GRE code is 1856.

After completing the CASPA application the applicant should complete the UAB SPA Supplemental Application. Following the program's receipt of the CASPA application, official GRE scores, and UAB SPA Supplemental Application, the UAB Surgical PA Program will review the packet.
Completed applications are reviewed by members of the admissions committee. Approximately 100 of the best applicants are selected to interview. Interviews are held in December and in January. Admissions decisions are finalized in February. Students who are accepted to the Surgical Physician Assistant program will need to complete the UAB Graduate School application.

Admissions Timeline

- August 31:: Last day to take the GRE
- May – September 1: Complete the CASPA application www.caspaonline.org
- September 7: Postmark deadline for mailing the UAB Supplemental Application.
- September – December: Application review
- November, December and January: Interviews
- February: Admissions decisions finalized
- February – March: Complete the UAB Graduate School Application (admitted and waitlisted students only)
- August: Program starts

Additional Information

Deadline for All Application Materials to be received by the CASPA:	Completed applications must be received by the Central Application Service for Physician Assistants (CASPA) no later than September 1 the year prior to the expected term of enrollment
Number of Evaluations/ Letter of Recommendations Required:	Three
Entrance Tests	GRE (TOEFL is required for international applicants whose native language is not English.)

Financial Support

Scholarships available to students enrolled in the Surgical Physician Assistant Program are:

Albert E. Purser Scholarship: A grant for first or second year students with financial need who are permanent residents of Alabama. Contact Patricia Jennings for an application.

Dean's Merit Scholarship: One one-year scholarship is awarded each year to a senior student in the Surgical Physician Assistant Program. The scholarship is based strictly on academic merit and is disbursed over a three-semester period.

Minority Student Scholarship: One one-year scholarship is awarded each year to a second year student in the Surgical Physician Assistant Program. The scholarship is based on academic merit and financial need, and is disbursed over a three-semester period.

Henry L. Laws Scholarship Loan: A loan for a first or second-year student in good academic standing and a demonstrated financial need. The amount of the loan varies, and it is only awarded once to a student. The loan is established and supported by alumni. Contact Patricia Jennings for an application.

Earl W. Hall Loan: Seniors with an emergency financial need may apply for this low-interest loan. See SHP administrative offices for further details. The loan is administered by the Matthew F. McNulty, Jr. Health Sciences Emergency Loan Fund Committee).

Contact Information

For detailed information, contact:
CDS Admissions Surgical Physician Assistant Program
University of Alabama at Birmingham, SHPB 430
Birmingham, Alabama 35294-1212

Telephone: (205) 934-3209

E-mail: AskCDS@uab.edu

Web address: **www.uab.edu/surgicalpa**

Course Descriptions

PA 601. **Human Gross Anatomy.** This course provides a comprehensive survey of the gross anatomy of the human along with functional and applied anatomy as it relates to common clinical findings. It utilizes a lecture format and cadaver dissection laboratory sessions. (4 Credits). Prerequisites: enrollment in the Surgical PA Program or approval of the instructor.

PA 602. **Medical Physiology.** This course emphasizes the normal function and control of various systems within the human body. The principles taught will serve as a foundation for understanding the etiology, management and prevention of disease processes. (4 Credits). Prerequisites: enrollment in the Surgical PA Program.

PA 603 and PA 604 **Pharmacology I. and II.** These two courses provide students with the pharmacologic knowledge needed to begin practice as primary care physician assistants. They are delivered via classroom lecture and supplemented with case studies that require students to critically evaluate medical conditions and choose safe and effective medications for treating those conditions. (3 credits each). Prerequisites: enrollment in the Surgical PA Program. Enrollment in PA 604 requires successful completion of PA 603.

PA 605. **Pathology.** This course is designed to describe the pathologic processes involved in common disorders and diseases, introduce students to the principles of clinical medicine and clinical problem solving, and provide students with the background needed for the clinical courses taught later in the curriculum. (3 credits). Prerequisites: enrollment in the Surgical PA Program.

PA 606. **Clinical Medicine I.** This is an introductory course in clinical medicine that is designed to introduce PA students to common disorders and disease encountered in primary care medicine. It covers the etiology, evaluation and treatment of diseases of the dermatologic, ophthalmologic, musculoskeletal, cardiovascular, pulmonary and neurological systems. It is taught at the level of a primary care PA, and endeavors to provide students with the background needed for the clinical courses taught later in the curriculum. Guest lecturers are utilized in this course. (4 Credits. Prerequisites: successful completion of PA 602, PA 605, PA 610, and PA 601.

PA 607. **Clinical Medicine II.** This is the second semester of an introductory course in primary care clinical medicine for PAs. It covers the etiology, evaluation, and treatment of common diseases and disorders encountered in obstetrics and gynecology, pediatrics, nephrology, endocrinology, and preventive medicine. Guest lecturers are utilized in this course. (6 Credits). Prerequisites: successful completion of PA 606.

PA 608. **Introduction to Surgical Diseases I.** This course introduces students to common surgical disorders, with an early emphasis on physiologic changes and evaluation of patients before, during, and after surgery. It provides basic instruction in the diagnosis, management, and complications associated with common surgical gastrointestinal and musculoskeletal disorders. (3 credits). Prerequisites: enrollment in the Surgical PA Program.

PA 609. **Introduction to Surgical Diseases II.** This course is the second course in a two-semester series that focuses on the preoperative and postoperative evaluation and management of common disorders of the heart, lungs, urogenital, vascular systems, and organ transplant. This course also provides instruction in the emergency medicine team concept, and the management of trauma patients. (3 credits). Prerequisites: successful completion of PA 608.

PA 610**. Clinical Laboratory Medicine.** This is an introductory course in laboratory diagnostics that emphasizes pathology, microbiology, hematology, and clinical chemistry. It utilizes a lecture format, as well as specimen handling in a clinical laboratory and cost effective diagnostic algorithms in problem-based case scenarios. (3 Credits). Prerequisites: enrollment in the Surgical PA Program.

PA 611 and PA 612. **History and Physical Diagnosis I and II.** These courses provide students with the skills necessary to elicit a comprehensive medical history, perform a complete physical examination, and

systematically report their findings. A variety of teaching formats are utilized, including lectures, small group activities, video productions, and simulated patients. (3 Credits per semester). Prerequisites: enrollment in the Surgical PA Program. Enrollment in PA 612 requires successful completion of PA 611.

PA 613. **Surgical Care Techniques.** PA 614. **Operating Room Techniques.** These are two courses in a two-semester series that provide instruction in the skills and surgical techniques involved in a variety of invasive surgical procedures. Skills are taught in a surgical laboratory utilizing live pigs in PA 613. In PA 614, students are assigned to operating rooms within Birmingham hospitals to learn the basics of surgical first assisting. (3 credits for Surgical Care Techniques, 2 credits for Operating Room Techniques). Prerequisites: enrollment in the Surgical PA Program. Enrollment in PA 614 requires successful completion of PA 613.

PA 615. **Introduction to the Profession.** This course is designed to introduce students to the Physician Assistant Profession and to prepare them to practice as professionals in a physician/PA/patient team in various health care settings with varied health care professionals. It will cover roles and responsibilities of the PA including their expected legal and moral behavior, their understanding of laws governing their practice and their ethical responsibilities in being health care professionals. The course will also teach students to respect the health, safety, welfare, and dignity of all human beings and to assess their own personal capabilities and limitations, striving always to improve their medical practice. This course is required by the accrediting body for the Physician Assistant profession and will be presented at the level of a primary care provider and utilize guest lecturers and program faculty. (1 credit). Prerequisites: enrollment in the Surgical PA Program.

PA 616. **Electrocardiography.** This course presents the basic concepts needed to interpret the electrocardiogram and will provide opportunities to develop interpretive skills through analysis of rhythm strips and 12-lead electrocardiograms. Upon completion of the course, students will be able to systematically interpret basic rhythm strips and 12-lead electrocardiograms. (1 Credit). Prerequisites: enrollment in the Surgical PA Program.

PA 617. **Applied Behavioral Medicine.** This course provides the surgical physician student with an introduction to clinical psychiatry and health behavior. Topics covered in psychiatry include psychiatric evaluation, mood disorders, anxiety disorders, schizophrenia and other psychotic disorders, psychiatric emergencies, personality disorders and psychopharmacology. Health behavior topics include the use of health education and communication theoretical models to affect behavioral change. This knowledge will enable students to incorporate health promotion and disease prevention strategies in their daily clinical practice to the benefit of their patients. (2 Credits)

PA 618. **Risk Management.** This course provides an introduction to the legal, political and professional issues affecting physician assistant practice. (1 credit). Prerequisites: enrollment in the Surgical PA Program.

PA 619. **Fundamentals of Clinical Research.** This course provides students with the foundation of epidemiologic measures, the reasons for patterns of disease occurrence, the principles of medical surveillance, the methods for investigating disease outbreaks, and the principles of diagnostic tests. Students will review study designs, the roles of variability and bias in the interpretation of scientific literature, and the principles of clinical decision-making based on medical literature. (3 credits). Prerequisites: enrollment in the Surgical PA Program.

PA 620. **Literature Evaluation.** This course is designed to prepare students to be critical thinkers. Covers methods on how to critically evaluate medical literature and strategies that should be utilized when making medical decisions based on current literature. By the end of the course, the student will identify their master's research topic. (2 credits). Prerequisites: enrollment in the Surgical PA Program.

PA 634. **Simulation Lab.** Laboratory simulated clinical experience to provide supervised practice in clinical skills, practical procedures, teamwork, patient management, and decision making in preparation for the student's clinical year (1 semester credit).

PA 621-PA 637. **Clinical Services I-XII.** The 12 month clinical phase is composed of 10 required and 2 elective rotations lasting 4 weeks each. Required rotations include Obstetrics and Gynecology, Emergency Medicine, Pediatrics, Inpatient Medicine, Outpatient medicine, Psychiatry/Geriatrics, Orthopedics, General Surgery, and Cardiovascular Thoracic surgery. Students must successfully complete the end-of-rotation exam at the conclusion of all required rotations. (4 credits/rotation). Prerequisites: enrollment in the Surgical PA Program

PA 638, PA 639, PA 640. **Senior Seminar Series.** Clinical year students return to campus each week to participate in a seminar series and evaluation exercises. These courses are taught during the clinical year of the curriculum, and focus on a review of primary care medicine topics covered in the PA National Certification Examination (PANCE). Students are required to orally present 30-minute pre-assigned topics and develop an accompanying one-page outline summarizing important points. Student presentations may be supplemented by cases seen on rotations or information gained from professional development seminars. (3 credits each for PA 638 and PA 639; 2 credits for PA 640). Prerequisites: enrollment in the clinical phase of the Surgical PA Program.

PA 698. **Master's Project.** This course runs concurrently with the students' clinical year rotations. Students will have chosen a project of study/research as a component of PA 620 during their last didactic

semester. Each student will be assigned to a SPA Program faculty with whom he/she will work closely in designing, researching, writing, and presenting his/her final paper as a culminating academic achievement. Other advisors may be assigned if the student chooses a topic better mentored by a faculty member in another department or school. The purpose of the Master's Project is to have the student demonstrate "satisfactory" ability to analyze and synthesize scientific information and contextual learning in a focused area of medicine. (2 credits). Prerequisites : successful completion of PA 619 and PA 620.

Gerontology

Certification Program

Director:	Dr. Patricia L. Sawyer
Phone:	(205) 934-9261
E-mail:	psawyer@uab.edu
Web site:	**www.aging.uab.edu**

Faculty

Allman, Richard M.; Professor (Medicine); Director, Birmingham/Atlanta VA Geriatric, Research, Education, and Clinical Center (GRECC); Mobility Impairment and Its Complications; Geriatric Care Quality Improvement

Ball, Karlene; Professor (Psychology); Clinical Science/Patient-Oriented Research; Health Services Research; Mobility Impairment and Its Complications

Rothrock, Angela G.; Assistant Professor (Division of Gerontology and Geriatric Medicine)

Drentea, Patricia; Associate Professor (Sociology); Socioeconomic Aspects of Aging, Health and Disability, and Work and Family, Research Methods

Perkins Waters, Martinique; Assistant Professor (Health Behavior); Caregiving, Quality of Life Indicators.

Ghanta, Vithal K.; Professor (Biology); Tumor Immunology, Aging and Immune System

Peel, Claire; Professor (Physical Therapy); Fall Prevention, Exercise as an Intervention to Enhance Mobility

Sawyer, Patricia L.; Associate Professor (Social and Behavioral Science Section); Gerontology, Medical Sociology, Minority Aging

Shewchuk, Richard M.; Professor (Health Services Administration); Health and Long-Term Care Issues in Aging

G. Bradley, Virginia; Associate Professor (Social and Behavioral Science Section); Cognition and Mobility, Dementia Caregiving, Loss of Capacity in Alzheimer's Disease

Program Information

The Gerontology Education Program was established in 1980 through the cooperative efforts of the School of Social and Behavioral Sciences and the Center for Aging. Since that time, the program has expanded considerably and offers diverse academic opportunities. Students have access to a number of faculty members from multiple disciplines who bring research and academic expertise to the study of aging and the aged.

The Gerontology Education Program offers multidisciplinary academic courses in gerontology leading to a graduate certificate. The study of gerontology at these levels is designed to provide people educated in various disciplines with the background needed to work in programs related to aging and the aged. The main goals are to provide students with a thorough background in existing theory and research in gerontology, and a supplement to their existing backgrounds and professional disciplines. We have designed the program to prepare students for leadership roles in this field of growing importance for both the private and public sectors. Our program's curriculum integrates research, theory, and practice. Its multidisciplinary approach reflects the urban mission of UAB.

The program office is located at the UAB Center for Aging. This academic program is administered by the Director of the Gerontology Education Program, who also serves as Chair of the Guidance Committee on Graduate and Undergraduate Education in Gerontology. This committee is made up of representatives of academic departments and schools throughout the UAB campus active in the study of aging and the aged. The multidisciplinary gerontology program is offered to all UAB students in good standing with the sponsorship and support of the School of Social and Behavioral Sciences, the School of Health Related Professions, and the Center for Aging.

Student Admissions and Advisement

Although general advisement is handled through UAB student advising and parent departments, student advisement in gerontology is handled formally by the Director of the Gerontology Education Program. The director facilitates student advisement with other members of the Committee on Graduate and Undergraduate Education in Gerontology.

A graduate specialty is offered to students who want a special emphasis in gerontology or geriatrics. The major objective of this specialization is to provide a strong academic background for professional careers in academic and aging-related settings. There are two avenues for undertaking the graduate gerontology certificate requirements. Students in good standing in the graduate school can specialize in gerontology through their primary department. Letters of application also are accepted from students who have already completed requirements for an advanced or professional degree.

Students not currently enrolled in a graduate program at UAB may petition the university for nondegree admission status. Once accepted, the student can undertake a course of study to receive a graduate certificate upon completion of the required sequence of classes.

A careful review of proposed curriculum is recommended before the student enrolls for gerontology study. This will give students an opportunity to receive initial advisement while reviewing available study plans and course schedules.

Requirements

Students must complete at least 15 credit hours of graduate-level work in gerontology or geriatrics, achieving a grade of B or better in each course. The curriculum consists of a required multidisciplinary course offered through the graduate school (GRD 600), three gerontology electives chosen from a roster of courses approved by the Committee on Graduate and Undergraduate Education in Gerontology, and a required research project or a relevant internship. To ensure a multidisciplinary perspective, courses must represent at least two departments.

Additional Information

For detailed information, contact Dr. Patricia L. Sawyer, Director, UAB Gerontology Education Program, Center for Aging, Room 201-E1, 933 19th Street South, Birmingham, AL 35294-2041.

Telephone 205-934-9261

Fax 205-934-7354

E-mail **psawyer@uab.edu**

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

Gerontology (GER)

Required Course

GRD 600. **Core Issues in Aging**. A multidisciplinary approach will be used to consider dimensions of the aging process. This course explores individual and societal meanings of aging and old age through the study of the biological, psychological, and sociological changes accompanying aging as well as current issues and controversies in the study of aging. 3 hours.

Electives

NUR 533. **Living with Loss Across the Life Span**. Involves world religion, spiritually broad journals, presentations, activity with belief systems other than the students', church services, weddings, funerals, etc. Prerequisite: Permission of instructor. 3 hours.

NUR 499/534. **Spirituality in Health Care Across the Life Span**. The course covers developmental loss, social life style, affects on family, divorce, retirement, etc. Prerequisite: Permission of instructor. 3 hours.

540. **Biology of Aging**. Current understanding of aging, measuring aging changes, theories of aging, and aging changes in various human systems. Prerequisite: BY 101 or permission of instructor. Additional requirements for graduate credit: discretion of instructor. 3 hours.

590. **Seminar in Gerontological Substantive Areas**. Individually designed research agendas for students wishing to conduct semi-independent research or guided reading in social gerontology. Prerequisite: Permission of instructor. 1-3 hours.

595. **Independent Study in Long-Term Care**. Individually designed research agendas for students wishing to conduct semi-independent research or guided reading in long-term care. Prerequisite: Permission of instructor. 1-3 hours.

GRD 601. **Research Methods in Gerontology**. Basic research designs and choosing appropriate research designs. Current research methodology including data management and analyses used in studies of health and aging are covered through a series of seminars and meetings. 3 hours.

GRD 602. **The Health Care of Older Adults.** The focus of this course is on medical and health issues related to older adults. Physical and psychological aspects of normal aging will be discussed. Principles

of geriatric medicine are covered, including clinical presentation and functional assessment of older adults as well as age-related diseases and geriatric syndromes. 3 hours.

604. **Health Literacy and Aging.** This course will define the concepts of health literacy and the relationship of health literacy to competent provision of health care. Individual and institutional barriers to health literacy will be discussed in addition to methods to screen and improve health literacy of older adults. 1 hour.

605. **Cultural Competency and Aging.** This course will provide an interdisciplinary overview of factors that may impact culturally competent care for older adults. The impact of language, literacy, and socioeconomic status (SES) will be discussed in the context of cultural competence. Barriers to providing culturally competent health care will be addressed. 1 hour.

606. **Ethics and Aging.** This course will provide an overview of ethical dimensions in later life. Issues related to ethical decision making in the health professions will be addressed, including decision making protocols, team functioning, and issues related to end-of-life care. Social and institutional ethics involving older adults will also be discussed. 1 hour.

611. **Managed Care**. Explores the organization and management of alternative health care delivery systems. Emphasis is placed on understanding the position these new organizational forms have in the U.S. health care system. The focus of the course is on organizations providing managed, ambulatory, and long-term care. 3 hours. 1 hour.

624. **Multidisciplinary Research in Aging Colloquium**. Discussion of current research in selected aspects of aging-related studies. Speakers are chosen to reflect the variety of scientific disciplines conducting inquiry on the theme. 3 hours.

638 & 738**. Geriatrics and Gerontology Interdisciplinary Core Curriculum**. The UAB Geriatrics Education Center coordinates the curriculum, consisting of lectures on the multidisciplinary treatment of health and aging issues. 3 hours.

643. **Long-Term Care Administration**. Seminar analysis of effect of chronic conditions and aging on delivery of health services; nursing homes and alternatives, mental health facilities and agencies; rehabilitation facilities and services. Field trips and individual research projects. 3 hours.

655. **Minority Aging**. Cross-racial and -ethnic exploration on national level of some special problems of minority aged groups, such as Latinos, Blacks, Chinese, Japanese, Koreans, Pacific Asians, and

American Indians. Discussions focus on family, church, health care, housing, adult education, retirement, income, and recreation. 3 hours.

665. **Geriatric Rehabilitation for the Health Professional**. Rehabilitation of the elderly person from the perspective of age-related changes, the impact of selected functional problems, psychosocial aspects of decreasing function, personal and environmental adaptations, and the continuing autonomy of the individual. 3 hours.

HCO 680**. Aging Policy.** Providing for the physical and economic well-being of the aging population is a continual challenge facing society. This course will discuss factors that shape public policy affecting the elderly in the U. S. and other developed countries. Basic statistics or the equivalent is a prerequisite for this course.

OT 688. **The Occupation of Caregiving: Caring for Older Adults.** Review social trends, programmatic initiatives, current research and policy implications. Students will gain a broad knowledge of the interplay between disease characteristics and needs for care. Permission of instructor. 2 hours.

691, 791. **Seminar in Gerontological Substantive Areas**. Individually designed research agendas for students wishing to conduct semi-independent research or guided reading in social gerontology. Prerequisite: Permission of instructor. 1-3 hours.

HCO 720. **Health Insurance and Managed Care**. Insurance as mechanism for dealing with consequences of an uncertain world. Health insurance and its consequences as significant reasons health care markets differ from others. Workings of insurance markets and current policy issues. Demand for health insurance, underwriting, rate making, moral hazard and adverse selection, HMOs and PPOs, employer health benefits and self insurance, Medicare and Medicaid, long-term care insurance and catastrophic coverage. Prerequisite: HCO 601 or equivalent. 3 hours.

734. **International Medical Sociology**. Cross-cultural, comparative analysis of health and health care delivery systems in both industrialized and developing countries.

755. **Race and Ethnic Relations**. Income inequality, school and residential segregation, intermarriage and interracial crime. 3 hours.

759. **Social Gerontology**. Consideration of some of the structural and behavioral implications of older adulthood in American society. Included will be such topics as the relationship of the aged to political, economic, educational, medical, religious, and other structures in society. 3 hours.

760. **Sociology of Death and Dying**. Sociological, social psychological and existential perspectives on death and dying; recent trends in definition, distribution, and practices surrounding death and dying. 3 hours.

769. **Sociology of the Life Cycle**. Consideration of sociological orientations to the life course. 3 hours.

777. **Demography of Health and Aging**. Demographic processes such as mortality, morbidity, disability, migration, and fertility and how each influences the number and proportion of the elderly, how these processes shape the age-sex structure of our population, and the demographic characteristics of older people.

779. **Medical Demography**. An examination of clinical, epidemiological, and sociological designs to investigate the effects of morbidity, disability, and mortality processes on human populations. 3 hours.

780. **Medical Sociology**. Theory and research in medical sociology; systematic overview of relevant literature. 3 hours.

781. **Sociology of Health**. Subjective experience of illness; predictions of health behavior; social networks and health.

785. **Psychology of Aging**. Age differences in perception, memory, intelligence, personality, adjustment, and psychopathology. 3 hours.

788. **Social Medicine**. Socioenvironmental factors in etiology of disease; social movements and health policy; medical ethics and broad ethical issues; place of societal science in medical care. 3 hours.

796. **Research Seminar Health and Aging**. Organized around a methods theme with lectures focusing on conducting social research, gaining access to research settings and getting started, writing grant applications, presenting papers at professional meetings, and thesis and dissertation proposal writing. Half of each class consists of lectures on developing research agendas. The other half of each class entails student presentation of developing research activities. 3 hours.

Medical Scientist Training Program (M.D., Ph.D.)

Degree: M.D.-Ph.D.

Director: Dr. Robin G. Lorenz

Phone: (205) 934-4092 or 934-0676

E-mail: rlorenz@uab.edu

Web site: **http://www.mstp.uab.edu**

Degree Requirements

UAB's outstanding research and clinical training programs provide an unusual opportunity for students interested in careers in basic biomedical research. Such students may be admitted concurrently to the School of Medicine and the Graduate School in order to pursue both the M.D. degree and the Ph.D. degree. Ph.D. study in this program is available in the areas of biochemistry and structural biology; biomedical engineering; biostatistics; cancer biology; cell, molecular and developmental biology; epidemiology; genetics and genomic sciences; immunology; microbiology, neuroscience; nutrition sciences; pathobiology and molecular medicine; sociology; and vision science.

Individuals admitted to this highly competitive program must have excellent undergraduate academic records and MCAT scores. In addition, successful applicants must have demonstrated their commitment to a career pathway as an investigator with active participation in an original research project prior to admission. Fellowship support, including a stipend and payment of tuition and fees, is provided to successful applicants.

In general, M.D.-Ph.D. students will first complete the basic science phase of the medical curriculum and the core curriculum of the basic biomedical sciences designed for Ph.D. students simultaneously. The second phase of study will focus on completion of a dissertation research project leading to the Ph.D. degree. The final phase of the program is a series of clinical rotations and an abbreviated set of acting internships to complete the M.D. degree. Normally, the program involves about 8 years for completion, depending on the time required to complete the dissertation research.

Interested applicants must complete the standard AMCAS application to the UAB School of Medicine and a short supplementary application to the combined degree program. More information is available at **http://www.mstp.uab.edu/process.html**

Students who have initiated study in the University of Alabama School of Medicine or the UAB Graduate School may also apply to the MD/PhD Program. Please contact the MSTP Director for further information.

Nursing (Ph.D., M.S.N., D.N.P.)

Degree Offered:	Ph.D.	Degree Offered:	M.S.N.
Director (Ph.D.):	*Pryor*	Director (M.S.N.):	*Hodges*
Phone:	(205) 975-5304	Phone:	(205) 996-7608
E-mail:	erpphd@uab.edu	E-mail:	ashleyhodges@uab.edu
Degree Offered:	D.N.P.	Degree Offered:	M.S.N.
Director (D.N.P.)	*Alexandrov*	Director (A.M.N.P.)	*Brooks & Langston*
Phone:	(205) 934-6852	Phone:	(205) 996-6679 (205) 934-6517
E-mail:	annealex@uab.edu	E-mail:	brooks4@uab.edu summer16@uab.edu
Degree Offered:	Nurse Anesthesia		
Director (C.R.N.A.)	Wright		
Phone:	(205) 934-7412		
E-mail:	wrightel@uab.edu		
Web site:	www.uab.edu/son		

Graduate Faculty

Anne, Alexandrov W., Professor (Nursing); Adult/Acute Health Chronic Care & Foundations

Azuero, Andres, Assistant Professor (Nursing); Community Health Outcomes & Systems

Britt, Sylvia, Assistant Professor (Nursing); Family/ Child Health & Caregiving

Brown, Kathleen C., Professor (Nursing); Community Health Outcomes & Systems

Childs, Gwendolyn, Assistant Professor (Nursing); Family/ Child Health & Caregiving

Christian, Becky, Professor (Nursing); Community Health Outcomes & Systems

Day, Sara, Associate Professor (Nursing); Community Health Outcomes & Systems

Elias, Beth, Assistant Professor (Nursing); Community Health Outcomes & Systems

Enah, Comfort, Assistant Professor (Nursing); Community Health Outcomes & Systems

Epps, Chad A., Associate Professor (Anesthesiology)

Frenette, Luc, Professor (Anesthesiology), Medical Director

Fogger, Susanne, Assistant Professor (Nursing); Community Health Outcomes & Systems

Harper, Doreen C., Dean and Professor (Nursing); Community Health Outcomes & Systems

Heaton, Karen, Assistant Professor (Nursing); Community Health Outcomes & Systems

Hess, Mary Annette, Assistant Professor (Nursing); Family/ Child Health & Caregiving

Hill, M. Gail, Associate Professor (Nursing); Adult/Acute Health Chronic Care & Foundations

Hodges, Ashley, Assistant Professor (Nursing); Family/ Child Health & Caregiving

Holcomb, Lygia, Associate Professor (Nursing); Family/ Child Health & Caregiving

Humber, Michael, Assistant Professor (Nurse Anesthesia)

Ivey, Jean, Associate Professor (Nursing); Family/ Child Health & Caregiving

Jukkala, Angela, Assistant Professor (Nursing); Community Health Outcomes & Systems

Keltner, Norman, Professor (Nursing); Community Health Outcomes & Systems

McCarty, Karen, Assistant Professor (Nursing); Community Health Outcomes & Systems

McGuinness, Teena, Professor (Nursing); Community Health Outcomes & Systems

McNees, Patrick, Professor (Nursing); Community Health Outcomes & Systems

McLain, Rhonda, Assistant Professor (Nursing); Adult/Acute Health Chronic Care & Foundations

Meneses, Karen M., Professor and Associate Dean for Research (Nursing); Adult/Acute Health Chronic Care & Foundations

Moneyham, Linda, Professor and Endowed Chair (Nursing); Community Health Outcomes & Systems

Moss, Jacqueline, Associate Professor and Assistant Dean for Clinical Simulation and Technology (Nursing); Community Health Outcomes & Systems

Patrician, Patricia A., Associate Professor (Nursing); Community Health Outcomes & Systems

Pearce, Patricia F., Assistant Professor (Nursing); Community Health Outcomes & Systems

Phillips, Jennan, Assistant Professor (Nursing); Community Health Outcomes & Systems

Pryor, Erica R., Associate Professor (Nursing); Community Health Outcomes & Systems

Reed, Linda, Assistant Professor (Nursing); Community Health Outcomes & Systems

Rice, Marti, Associate Professor (Nursing); Family/ Child Health & Caregiving

Riggs, Jennifer, Assistant Professor (Nursing); Community Health Outcomes & Systems

Robinson, Cheryl, Associate Professor (Nursing); Family/ Child Health & Caregiving

Selleck, Cynthia, Professor (Nursing); Family/ Child Health & Caregiving

Smith, Glenda L., Assistant Professor (Nursing); Family/ Child Health & Caregiving

Su, Xiaogang, Associate Professor (Nursing); Adult/Acute Health Chronic Care & Foundations

Turner-Henson, Anne, Professor (Nursing); Community Health Outcomes & Systems

Vance, David E., Assistant Professor (Nursing); Family/ Child Health & Caregiving

Williams, Anne, Assistant Professor (Nursing); Adult/Acute Health Chronic Care & Foundations

Wilson, Lynda H., Professor (Nursing); Family/ Child Health & Caregiving

Wright, E. Laura, Assistant Professor (Nurse Anesthesia)

Ph.D. Program Description

The Doctor of Philosophy in Nursing is designed to prepare professional nurses as scholars, leaders, and researchers who will make a substantive contribution to the body of knowledge for the discipline of nursing and thereby improve health outcomes for those who receive nursing care. The program of studies builds on preparation at the master's or baccalaureate level. Graduates are prepared for culturally effective leadership roles in research, education, health policy, and health care. Doctoral students have the opportunity to develop expertise and conduct research in a selected content area. In addition to structured coursework, the program builds upon a mentorship model which recognizes that research skills are learned most effectively by working with a faculty research mentor who provides opportunities to practice the use of research techniques and the design and execution of original research within a focused program of research. In addition to core program course requirements, students complete at least 12 credits of required courses and electives in a selected content area. The PhD program was initiated in 1999. Initiated in 2000, the Post-Bachelor's PhD Option allows individuals with baccalaureate degrees in nursing to complete the PhD in nursing without first obtaining a master's degree.

Ph.D. Program Goals

The PhD curriculum prepares graduates to examine models, concepts and theories for their application in expanding the body of nursing and health care knowledge to: contribute to nursing science and health care through research that is disseminated in professional publications and presentations to the scientific communities and health care consumers; to conduct health care investigations based upon scientifically sound conceptual and methodological decisions about research designs, measures, and analytic methods; to reflect a consistent commitment to scientific integrity in the design, conduct, and dissemination of research; to initiate and collaborate in interdisciplinary research and scholarly endeavors that contribute to health outcomes in a culturally effective manner; and to assume leadership roles in research and scholarship.

Ph.D. Admission Requirements

A Master of Science in Nursing (MSN) degree from an accredited institution in the United States, or approved by the Minister of Education for schools of nursing in foreign countries, equivalent to that in the UAB School of Nursing;
A minimum grade point average of 3.0 overall (based on a 4.0 scale) on all graduate level coursework;
For applicants from non-English speaking countries: a satisfactory TOEFL score (minimum 550);

Computer literacy and access is required, with proficiency in word processing and e-mail correspondence, as well as familiarity and experience with the Internet. It is recommended that each student have their own personal computer meeting the specifications of the School of Nursing. (Specifications are available from the School of Nursing website);
Eligibility for licensure as a Registered Nurse in the United States;
A written goal statement which evidences congruence between the applicant's research interests and School of Nursing faculty research;
At least one sample of independent written work (in English) that demonstrates the applicant's scholarship potential. Representative examples include a paper, proposal, report, or publication;
A current curriculum vita;
Three references from individuals with expertise to comment on the applicant's capability for research and scholarship (for example, University professors, employers); at least one of the references must be from a doctorally prepared nurse, and;
A personal interview.
NOTE: For the Post-Baccalaureate PhD option, the corresponding requirements are:

A Bachelor of Science in Nursing (BSN) degree from an accredited institution in the United States, or approved by the Minister of Education for schools of nursing in foreign countries, equivalent to that in the UAB School of Nursing;
A minimum grade point average of 3.0 overall (based on a 4.0 scale) on all undergraduate level coursework;
For applicants from non-English speaking countries: a satisfactory TOEFL score (minimum 550);
Computer literacy and access is required, with proficiency in word processing and e-mail correspondence, as well as familiarity and experience with the Internet. It is recommended that each student have their own personal computer meeting the specifications of the School of Nursing. (Specifications are available from the School of Nursing website);
Eligibility for licensure as a Registered Nurse in the United States;
A written goal statement which evidences congruence between the applicant's research interests and School of Nursing faculty research;
At least one sample of independent written work (in English) that demonstrates the applicant's scholarship potential. Representative examples include a paper, proposal, report, or publication;
A current curriculum vita;
Three references from individuals with expertise to comment on the applicant's capability for research and scholarship (for example, University professors, employers); at least one of the references must be from a doctorally prepared nurse, and;
A personal interview.

Ph.D. Degree Requirements

Candidates for the degree of Doctor of Philosophy in Nursing must complete the following requirements:

Coursework and experiences based on the student's background and substantive area, with an overall GPA of 3.0 or better, and grades of B or better in all required courses on the approved program of studies;
A comprehensive examination administered upon completion of an individualized program of studies; and
A written dissertation demonstrating competence in research, individual inquiry, critical analysis, and in-depth treatment of a health care problem in the selected content area. The investigation must make a genuine contribution to knowledge, concepts, and theories in nursing. A final defense of the dissertation is required.

Postdoctoral Study

Postdoctoral studies in nursing are individually arranged based on a student's learning needs in specific areas of interest that match the strengths of the graduate faculty. The focus of postdoctoral study is on expanding and extending the student's knowledge base in nursing theory, practice, research, and generally centers on a research effort of mutual interest to the student and faculty mentor.

D.N.P. Program Description

The DNP is a practice-focused terminal degree to prepare graduates to practice at the highest level in specialty practice or to assume leadership positions in healthcare. Graduates of the DNP program will focus on providing care to populations and communities with an emphasis on improving quality and access to underserved, diverse populations. The three components of the DNP are advanced clinical specialty practice, leadership, and practice inquiry. Graduates will employ abilities and skills in these areas to advocate for reasonable, rational, and data-driven health regulations, standards, and evidence-based practices; sustain collaborative and strategic relationships, promote innovative, effective health care programs; and form partnerships with diverse groups to address health disparities. In addition, graduates will be prepared to assume clinical faculty positions to address the critical nursing faculty shortage.
For most students, the Post-Master’s DNP curriculum will be a minimum of 34 credits, which includes the development of a practice or leadership focused project. This Scholarly Project is designed to synthesize scholarship in an advanced practice specialty or an area of healthcare leadership and serves as a capstone program experience. All courses are offered in a distance accessible format and students may develop the scholarly project under the direction of program faculty and onsite mentors. Applications will be accepted twice a year for the summer or fall term, to either a full or a part-time cohort. Students enrolled in the DNP program will be required to come on campus between the first and second year for a

two to three day intensive experience.

D.N.P. Program Goals

The D.N.P. program of study is designed to prepare nurses who: evaluate policy, care delivery, and organizational systems for current and future health care needs; translate scientific, theoretical, and ethical principles into healthcare for individuals, families, and populations; incorporate knowledge of current and emerging health technologies to improve care delivery and organizational systems; advocate for social justice, equity, and ethical policies in healthcare; Demonstrate intra and inter-professional collaboration to address health disparities and to improve health care quality across diverse populations and cultures; assume complex leadership roles to advance clinical practice and healthcare delivery at the organizational and systems level and to improve health outcomes of individuals and populations, and assume complex leadership roles to advance clinical practice and healthcare delivery at the organizational and systems level and to improve health outcomes of individuals and populations.

D.N.P. Admission Requirements

Admission is competitive, based on an assessment of the ability of the applicant to complete the program of studies and on the appropriateness of the requested program of studies to the applicant's stated goals. Because only a limited number of applicants can be accommodated in a given academic year, some well-qualified applicants may not be offered admission. In cases where there are more qualified applicants than slots available, the School of Nursing accepts the most qualified applicants. **Eligible candidates for admissions will provide evidence of:**

A master's degree in an area of advanced nursing practice (Nurse Practitioner, Clinical Nurse Specialist, Nursing Administration, or Nurse Anesthetist) from a regionally accredited institution; equivalent to that in the UAB School of Nursing;
Current professional certification as an Advanced Practice Nurse (if applicable);
A graduate grade point average of at least 3.0 overall (based on a 4.0 scale) or on the last 60 hours of earned credit;
Three favorable completed *Evaluation Forms* from persons who have knowledge of the applicant's potential for success for graduate nursing studies and advanced practice nursing;
Evidence of a license as a (1) Registered Nurse and (2) Advanced Practice Nurse or eligibility in the state in which the applicant plans to practice. Both documents must be notarized if the applicant is not a licensed nurse in Alabama;
Confirmation of completed clinical hours in advanced specialty;
Personal goal statement that is congruent with the program goals (300 words or less);
Resume or Curriculum Vitae; and

A personal interview by phone or in person with a School of Nursing faculty member or designee.

D.N.P. Degree Requirements

Candidates for the DNP degree must complete the following requirements: Completion of all coursework and clinical experiences based on the student's Program of Studies, with an overall GPA of 3.0 or better, and grades of B or better in all required courses in the School of Nursing.

M.S.N. Program Description

The MSN curriculum is designed to prepare nurses for advanced generalist or specialty practice, advanced nursing roles, and doctoral study in nursing. Preparation for advanced study in nursing at the MSN level is available in a variety of specialties and advanced roles including **Nurse Practitioner** **Nurse Educator**, **Nursing Informatics**, and **Nurse Administrator**. Students are admitted to master's study during the fall and spring terms. Students may elect a full-time program of study in the fall term or a part-time program of study in the fall and spring terms. All nursing core courses and the majority of the master's specialties are offered in the distance accessible format. Clinical experiences for the MSN student are designed on an individual basis. The student contracts to work with a clinical preceptor who is a certified registered nurse practitioner, a registered nurse, or a physician. The total number of clinical hours required varies depending on the option that selected. Students must meet the full-time relevant clinical practice experience requirement of the specialty and have a current RN license in the state in which they will do their clinical practice prior to enrolling in the advanced practicum courses. Because only a limited number of applicants can be accommodated in a given academic year, some well-qualified applicants may not be offered admission. In cases where there are more qualified applicants than slots available, the School of Nursing accepts the most qualified who apply.

Non-Degree Options at the MSN Level

Post MSN Nurse Practitioner SpecialtiesMSN graduates who wish to take a designated program of study in preparation for sitting for one of the nurse practitioner certification examinations may apply for non-degree graduate status. This category is called the **Post MSN Nurse Practitioner Option**.

Teaching*Certificate for Post BSN Applicants***-**Additionally, applicants at the post-baccalaureate level may choose to seek certification to prepare for the faculty role.

Clinical Research Management Certificate option that allows both nursing students and non-nursing applicants to pursue a Clinical Research Management certificate (paper application) or the BSN qualified applicants can pursue a Master's of Science in Nursing (on-line application).

Registered Nurse First Assist (RNFA) *Certificate for Post-Baccalaureate Applicants*- A Registered

Nurse First Assistant (RNFA) is prepared to practice in a variety of acute or critical care settings. The RNFA, in collaboration with the surgeon, provides continuous and comprehensive patient care throughout the perioperative period. (on-line application)

M.S.N. Program Goals

The MSN program of study is designed to prepare nurses who: synthesize research, theoretical formulations, and principles of scientific inquiry to provide evidence-based practice; assume leadership in managing and evaluating continuous quality improvement processes; use information systems/technology to evaluate programs of care, outcomes of care and care systems; advocate and implement health care policies that improve access, equity, efficiency, and social justice in the delivery of health care; design innovative educational programs for patients, nursing staff, and nursing students using teaching and learning principles; provide ethical, culturally sensitive care in an advanced nursing role independently and collaboratively with professionals from multiple disciplines; monitor the quality of one's own nursing practice based on professional practice standards and relevant statutes and regulations; and apply theories and principles of marketing, economics, consultation, management, and leadership to comprehensively perform an advanced nursing role.

M.S.N. Admission Requirements

Requirements for admission for the MSN degree include the following:

BSN degree from a regionally accredited institution, equivalent to the one offered by the School of Nursing, UAB;
Cumulative grade point average of at least 3.0 on a 4.0 scale or on the last 60 semester hours;
(Graduates of baccalaureate degree programs in countries other than the United States must have their baccalaureate degree transcripts evaluated by the Educational Credential Evaluators, Inc. OR The World Education Services Organization);
Combined score of 1,000 on verbal and quantitative sections of the GRE; or score of 410 on the MAT; or score of 480 on the GMAT; Test scores submitted to UAB from the GRE, GMAT, or MAT must not be over 5 years old. Applicants with a 3.2 GPA or better may waive the Test Score requirement if they meet the criteria, please see: **GRE/GMAT/MAT Waiver Process for degree seeking MSN students** ;
International students must achieve a TOEFL examination score of at least 550; and
Three (3) letters of professional reference attesting to the applicant's potential for graduate study.

M.S.N. Degree Requirements

Candidates for the MSN degree must complete the following requirements: Completion of all coursework and clinical experiences based on the student's Program of Studies, with an overall GPA of 3.0 or better,

and grades of B or better in all required courses in the School of Nursing.

A.M.N.P. Program Description

The Accelerated Master's Entry to Nursing Pathway (AMNP) is an alternate pathway into the existing master's in nursing (MSN degree) for applicants who have a bachelor's degree in a field other than nursing, who are not registered nurses, and who seek MSN preparation.

A.M.N.P. Admission Requirements

Admission is based on the applicant's academic record and all application materials at the time of the application deadline. *All grades (UAB and other colleges/universities) from previous college course work must be posted on applicant's UAB transcript by the application deadline. Courses *in progress* must be validated with a letter from the college or university students are attending.

Applicants must have earned a minimum of a baccalaureate degree from a regionally accredited college/university prior to beginning classes.
Upon receipt of ALL official transcripts, course work will be evaluated for advisement purposes regarding AMNP Foundational Courses.
GPA- The minimum cumulative AND foundational GPA for all AMNP applicants is 3.0 at the time of application.
Combined score of 1,000 on verbal and quantitative sections of the GRE; or score of 410 on the MAT; or score of 480 on the GMAT; Test scores submitted to UAB from the GRE, GMAT, or MAT must not be over 5 years old.
International students must achieve a TOEFL examination score of at least 500;
Three (3) letters of professional reference attesting to the applicant's potential for graduate study.
A resume, outlining health care interest/experience, campus/community involvement, leadership and employment. Resumes should not be more than one page in length. Applicants are strongly encouraged to provide proof of work/volunteer experience in a healthcare setting as part of the application process. The healthcare work is to be documented by letters from a supervisor (on agency letterhead). Completion of a nursing skills course does not meet this criterion.
Interviews- Due to the competitive nature, not all candidates that qualify for admission will be invited for interviews. Applicants will be notified within a month of the application submission deadline if they will be invited to participate in the interview round for continued consideration for admission. You will be given ample time to plan for a trip to campus if you are selected to be interviewed. Students will be notified within a month after the interviews of an admission decision.

A.M.N.P. Degree Requirements

The Program is divided into two phases: (I) the Pre-licensure phase and (II) the CNL phase. Students in

the Phase I must be prepared to dedicate 40 hours or more a week to the coursework and clinical for this program. Students find that it is not feasible for them to work while completing Phase I of this program. This is not a distance accessible program. Students must successfully complete Phase I and Phase II of the program to earn a degree in nursing.

Phase I: The pre-licensure phase: 50 Credits, 1395 contact hours

Phase I consists of 12 months of full time study during which students complete the required courses and clinical experiences ***equivalent*** to a BSN degree in preparation to apply for licensure as a registered nurse. While this will be an intense learning experience, students will emerge with the knowledge and skills required to function as a registered nurse. Upon successful completion of Phase I requirements, the University Registrar at UAB will send a certified letter to the Alabama Board of Nursing stating that students have successfully completed requirements equivalent to a BSN degree and are eligible to take the National Certification Licensure Exam for RNs (NCLEX-RN). Students who successfully complete the NCLEX-RN may subsequently apply for licensure and subsequently apply for employment as a Registered Nurse.

Phase II: The Master of Science Specialty Phase:

Phase II consists of four or more semesters of part time study via distance education through the School of Nursing and clinical work as a registered nurse. The typical programs of study are listed on each of the specialty track's individual fact sheet. The spring admission into a master's specialty track will provide you with an estimate length to complete your Master of Science in Nursing degree. **Successful completion of Phase II leads to a Master of Science in Nursing degree (MSN) with eligibility to take a board certification exam in most specialties. Only after successful completion of a board certification exam may the RN use the corresponding designation as part of their professional title.**

A.M.N.P. Program Goals

The MSN program of study is designed to prepare nurses who: synthesize research, theoretical formulations, and principles of scientific inquiry to provide evidence-based practice; assume leadership in managing and evaluating continuous quality improvement processes; use information systems/technology to evaluate programs of care, outcomes of care and care systems; advocate and implement health care policies that improve access, equity, efficiency, and social justice in the delivery of health care; design innovative educational programs for patients, nursing staff, and nursing students using teaching and learning principles; provide ethical, culturally sensitive care in an advanced nursing role independently and collaboratively with professionals from multiple disciplines; monitor the quality of one's own nursing practice based on professional practice standards and relevant statutes and

regulations; and apply theories and principles of marketing, economics, consultation, management, and leadership to comprehensively perform an advanced nursing role.

Nurse Anesthesia Program Information

The Nurse Anesthesia program prepares the registered nurse in all aspects of nurse anesthesia practice at the graduate level. The sequence of student coursework combines the knowledge of basic health sciences, scientific methodology in anesthesia, and advanced preparation to include a state-of-the-art scientific paper. Completion of the prescribed coursework and clinical practice comprise the requirements for the degree. The graduate is eligible to take the National Certification Examination, which, upon passing, allows them to practice as a certified registered nurse anesthetist.

The Nurse Anesthesia Program has received a ten-year accreditation in 2010 by the Council on Accreditation (COA) of Nurse Anesthesia Programs.

Council on Accreditation of Nurse Anesthesia Educational Programs
222. South Prospect Ave
Park Ridge, IL, 60068
Phone: (847) 692-7050
Website: http://www.aana.com/Credentialing.aspx

Nurse Anesthesia Admission Requirements

Qualified candidates are graduates from an accredited registered nursing program with a baccalaureate degree in nursing. It is essential that all coursework towards a BS be completed by December prior to the start of anesthesia school the following August. Students are required to provide proof of a valid professional RN license in the U.S. Only candidates with at least one year experience as an RN in a critical care setting are considered for admission. All sections of the GRE must be completed prior to application (Verbal Reasoning, Quantitative Reasoning, and Analytical Writing). Prerequisite courses must be completed by the September 1 deadline and include: Anatomy, physiology, microbiology, and chemistry. Due to the competitive nature, not all candidates that qualify will be invited for interviews. Those accepted will need to complete the UAB medical history questionnaire and physical, provide proof of required immunizations, and receive a satisfactory screening by the UAB Medical Center Student Health Service. Please visit the website at www.uab.edu/mna for other helpful information.

Nurse Anesthesia Curriculum

The Nurse Anesthesia Program begins in the fall semester of each year. It comprises 63 semester hours

of didactic instruction and (52) semester hours of clinical practicum and requires 27 months of full-time commitment. Students complete all foundation courses before beginning the clinical practicum, which starts after the first (ten) months of enrollment. The curriculum does not permit enrollment on a part-time basis.

Financial Aid

Many opportunities for financial aid are available in the form of living stipends, tuition and fee coverage and support for scholarship. Opportunities include graduate teaching or research assistantships; Graduate School fellowships; scholarships; and federal professional nurse traineeships. For a complete list of available financial aid and scholarships please visit http://www.uab.edu/nursing/development-a-alumni-relations/scholarships-fin-aid or contact the Office of Student Affairs in the School of Nursing at (205) 975-7529.

Other Policies of the School of Nursing

All students enrolled in clinical nursing courses (excluding the AMNP Program) must show proof of current nursing licensure from the state in which the student engages in clinical practice for their coursework, current CPR certification, OSHA training session on Bloodborne Pathogens and TB Occupational Health, and have medical clearance from UAB Student Health Services and complete an orientation program prior to beginning classes.

Additional Information

Deadline for Entry Term(s):	Variable
Deadline for All Application Materials to be in the Graduate School Office:	Variable
Number of Evaluation Forms Required:	Program Specific
Entrance Tests	Variable
Comments	See School of Nursing website for details
Graduate Catalog Description	

For detailed information regarding the Graduate Nursing programs, contact the Program Managers, UAB School of Nursing, NB 201A, 1530 3rd Avenue South, Birmingham, AL 35294-1210.

Telephone 205-975-7529

E-mail: A.M.N.P. , D.N.P. and Ph.D. jlavier@uab.edu Web **http://www.uab.edu/son/**

E-mail: Nurse Anesthesia StaceySmith@uab.edu

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

PhD

Course Descriptions

NBB 760. Biobehavioral Foundations in Nursing Research - Focuses on biobehavioral interactions among psychological and cognitive domain, social and environmental domain and biology as they affect health outcomes. The emphasis will be placed on the theories and concepts of each domain of biobehavioral interactions. 3 credit hours.

NBB 761. Biobehavioral Research: State of the Sciences - Focuses on in-depth exploration and critical analysis of current biobehavioral interaction research including conceptual and methodological issues. Examines the effectiveness of interventions on biobehavioral domains and health outcomes and identifies future directions for research. 3 credit hours.

NCH 760. Child Health Theories and Concepts - This course will focus on selected theories and concepts related to child health, child health nursing and child health nursing education. Emphasis will be on the theoretical underpinnings of the theories and concepts, major theorists associated with the theories and concepts, measurement strategies and instruments, and implications for research, education, and practice. 3 credit hours.

NCH 761. Emerging Issues in Child-Health Nursing - This course will focus on emerging issues in child health, child health nursing and child health nursing education. Emphasis is on current thought, state of the science and research related to topics which affect the health and lives of infants, children, and adolescents. Pivotal MCH, public health resources and the latest research and information will be used to guide discussion. 3 credit hours.

NFH 760. Family Health/Caregiving Across The Lifespan - The reciprocal relationship between family functioning and health is well known. The family plays an important and substantial role in the well-being of individuals and in turn, family relationships and functioning are significantly influenced by the health behaviors and status of family members. Families continue to be the major source of caregiving across

the lifespan and a rapidly growing body of research speaks to the positive and negative correlates of family caregiving for persons with crisis, chronic or terminal health problems. The study of caregiving within the context of the family lifespan offers the student an opportunity to understand health and illness within a framework of human development, interaction, and adaptation, as well as cultural and gender norms. 3 credit hours.

NFH 761. Theory Development In Family Health And Caregiving - This is a survey course in which students develop skill in evaluating selected theories for their current or potential relevance to research on family health, individual health in the context of the family, and family caregiving processes in health and illness. Students become conversant with a range of family and caregiving theories toward the goal of assessing their relevance for further knowledge development in family health and caregiving processes. Students will evaluate whether empirical findings refute or support traditionally accepted or theoretically based knowledge; they will review empirical literature to draw conclusions regarding emerging theories, associated constructs and hypotheses; and they will propose testable theoretically-derived hypotheses and theoretically-driven family focused interventions aimed at altering health status of families. 3 credit hours.

NFH 762. Family Research Methods - This course provides the student with the opportunity to develop skill in the critical analysis and application of family research methods as a foundation for conducting family research. In this course, students analyze and apply research findings and acquire and apply the knowledge necessary to implement family research studies. Students examine the utilization of exploratory, descriptive, longitudinal, and experimental designs in family studies, apply techniques for strengthening designs and address instrumentation, sampling, data collection, and analysis issues particular to family research. Experience is gained in instrument evaluation and selection, decision-making regarding level of variable formation, model validation through multiple measurement, and selection of appropriate statistical tests to capture the complexity and dynamic nature of the family. 3 credit hours.

NGN 731. Advanced Practice Gerontological Nursing I - This course is designed to provide DNP students who are already adult, adult acute, and/or family nurse practitioners and who are delivering care to a majority of gerontological patients, with an advanced theoretical and empirical knowledge of aging. This level of specialized gerontological nursing knowledge is beyond what would be obtained in an acute, adult, or family nurse practitioner program. The content in NGN 731Q and NGN 732Q satisfies the ANCC didactic requirements for a secondary certification as a gerontological nurse practitioner under the alternative eligibility requirements. This course and NGN 732Q should be considered for students interesting in a secondary licensure and is not intended for initial licensure as an advanced practice

gerontological nurse. Documentation of clinical hours required by the ANCC is incumbent upon the student, not the UASON. Questions concerning the alternative eligibility requirements may be addressed by course faculty or by the ANCC registrar. 3 credit hours.

NGN 732. Advanced Practice Gerontological Nursing II – This course is designed to provide DNP students who are already adult, adult acute, and/or family nurse practitioners and who are delivering care to a majority of gerontological patients, with an advanced theoretical and empirical knowledge of aging. This level of specialized gerontological nursing knowledge is beyond what would be obtained in an acute, adult, or family nurse practitioner program. The content in NGN 731Q and NGN 732Q satisfies the ANCC didactic requirements for a secondary certification as a gerontological nurse practitioner under the alternative eligibility requirements. This course and NGN 731Q should be considered for students interesting in a secondary licensure and is not intended for initial licensure as an advanced practice gerontological nurse. Documentation of clinical hours required by the ANCC is incumbent upon the student, not the UASON. Questions concerning the alternative eligibility requirements may be addressed by course faculty or by the ANCC registrar. 3 credit hours.

NPR 760. Conceptual Foundations for Promoting, Protecting, and Restoring Health - This course will be focused on theories, concepts and research related to promoting, protecting and restoring health. Students are expected to analyze cultural, social, racial and gender influences on health and research related to health promotion, protection and restoration. 3 credit hours

NPR 761. Interventions to Promote, Protect, and Restore Health - This course will be focused on in-depth exploration and critical analysis of current intervention research including conceptual and methodological issues. In addition, the course will be focused on designing research to evaluate the outcomes of interventions designed to promote, protect or restore health on individuals or community groups. 3 credit hours.

NRM 770. Designs for Nursing Studies I - In this course, special emphasis is placed upon the beginning phases of the research process, including formulation of research questions/aims, integration of theory and/or conceptual framework in the development of research, the critique and review of knowledge that support an identified area of research, and the discussion of the type of research design. Cultural implications and ethical standards for research will be addressed. 3 credit hours.

NRM 771. Methods/Measurement In Nursing Research - Instrumentation in nursing research involves measurement of biological, psychological and/or sociological aspects of human systems. This course is an overview of the theories, principles and techniques that yield reliable and valid measurement of human systems. Opportunities will be provided to evaluate the psychometric properties of selected measures

and strategies. This course is designed to aid the student in writing the measurement section of a research proposal in the focal area. 3 credit hours.

NRM 772. Designs of Nursing Studies II - This course focuses on sampling, collection of data, data analysis plans, presentation of findings, conclusions in various research designs and the reintegration of the findings into the body of knowledge in an identified area of research. Ethical and cultural issues related to the conduct of research will be addressed. Students will develop a research proposal. 3 credit hours.

NRM 773. Qualitative Research Methods - This core course focuses on sampling, design, analysis plans, presentation of results, findings, and conclusions in various research designs and the reintegration of the findings into the body of knowledge in an identified area of research. Ethical and cultural issues related to the conduct of research are also examined. 4 credit hours.

NST 772. Data Mining/Stats Learning I - NST 772 is an elective course for PhD students. This is the first course in a two-course series that provides further exposition of advanced statistical analysis and data mining techniques for students interested in doing research that involves considerable quantitative analysis in their dissertation and/or future professional work. 3 credit hours.

NST 773. Data Mining/Stats Learning II - NST 773 is an elective course for PhD students. This is the second course in a two-course series that provides further exposition of advanced statistical analysis and data mining techniques for students interested in doing research that involves considerable quantitative analysis in their dissertation and/or future professional work. Prerequisite: NST 772. 3 credit hours.

NST 776. Linear Models For Clinical Nursing Research - This course is designed as a survey course on the application of advanced General Linear Model and related techniques in health care research. The course will focus on application to research questions of importance to nursing, with an emphasis on practice-related problems. 3 credit hours.

NST 777. Multivariate Statistical Methods For Clinical Nursing Research - This course is designed as a survey course on the application of multivariate techniques in health care research. The course will focus on application of multivariate statistical methods to nursing-related research questions, with emphasis on interpretation within clinical nursing research problems. 3 credit hours.

NTC 760. Transitions to Academic Nursing Education – This course provides content relevant to the role of the nurse educator in an academic setting. The course includes information on nurse educator competencies, trends in higher education, the nature of our students in the 21st century, and strategies for building a successful nurse-educator career, including building collegial relationships and integrating

the teaching, research, and service missions of the university into one position. This course may be included in a program of study as an elective, or taken as a non-degree student. NTC 760 may also be taken by students in the Nurse Educator track in the MSN program. 3 credit hours.

NUR 706. Theory Building in Nursing - This course focuses on the nature of knowledge in practice disciplines with an emphasis on philosophy of science as an underpinning for knowledge development and research; approaches to theory, statement, and conceptual development, and criteria for evaluation of theory. Students examine a variety of sources regarding the nature and modes of theory, model, and concept development in practice disciplines. They select research literature in their substantive area for isolation of concepts, theories, and research contexts to assess congruence between theoretical and operational systems, and suggest ways to remedy problems. They interpret research reports in their substantive area from a theory development and testing perspective, providing a visual schematic representation of their analysis. Through group interaction, they formulate conclusions about the state of the art and forecast directions for theory development as a basis for practice. Each student develops a personal philosophy of science. 4 credit hours.

NUR 730. Current Topics in Nursing - A special topic seminar with variable focus. 1 - 3 credit hours.

NUR 741. Cancer Prevention and Control Training Program (CPCTP): Research Intensive - Grants process and proposal writing in healthcare research using NIH pre-doctoral and postdoctoral applications. Strategies for successful proposal preparation include the production of elements required in PHS-398 research grant proposal

NUR 750. Quantitative Research Methods - This course is a survey of quantitative research methods and the first required, research core course in the doctoral nursing program. The course is designed to prepare doctoral nursing students with the research knowledge and skills to: (1) use current research findings to improve practice, (2) use the process of research to examine questions identified in one's own nursing practice, and (3) contribute to expansion of nursing's knowledge base. This course will also include integration of the following elements and/or activities: critical thinking, synthesis of quantitative research literature, scholarly writing, scientific integrity and ethics, human diversity, and social issues. the advanced practice role emphasis of this course is that of investigator, research collaborator, and content expert in a selected practice field. Students must have a solid foundation in computer utilization and accessing scientific sources by internet. 3 credit hours.

NUR 752. Responsible Conduct of Research: A Cross-Cultural Perspective - This course will examine a wide range of historical and modern treatises that have shaped ethical practice in the dominant western culture as well as medical ethical theories in other cultures. The course will emphasize

comparing and contrasting various world views of ethical research practice from a cultural and global perspective. The content will focus on the pillars of liberal political theory which include respect for persons, autonomy, justice and rights-based codes. In addition, the expectations and regulations of Institutional Review Boards will be examined with an emphasis on developing effective strategies to anticipate procedural problems and expedite approval of student research applications. In addition, students will complete and provide proof of current completion of the UAB IRB training course (within 12 months) as an initial pass/fail learning activity. This course will also include integration of the following elements and/or activities: critical thinking, informatics, collaboration, scholarly writing, preparing/giving professional presentations, theory evaluation and application, human diversity, cultural competence, global concerns and health disparity issues. The advanced role emphasis of this course is that of investigator, research collaborator, and content expert in a selected practice field. 2 credit hours.

NUR 754. Issues in Leadership and Health Policy - This graduate core course is designed to prepare doctoral nursing students with advanced theory in health care leadership and analysis of health policy: (1) examine theories of leadership behavior to improve the delivery and or provision of nursing care, (2) examine aspects of leadership in policy analysis and advocacy, (3) develop an evidence-based foundation for practice as a nursing leader and (4) contribute to the improvement of patient care across the health care continuum through leadership. This course will also include integration of the following elements and /or activities: critical thinking, informatics, current technologies for information retrieval and data management, collaboration, scholarly writing, preparing/giving professional presentations, theory evaluation and application, scientific integrity and ethics, human diversity, cultural competence and health disparity issues. The advanced role emphasis of this course is that of research team leader, academic administrator, health policy advocate and content expert in a selected practice field. 3 credit hours.

NUR 756. Applied Statistical Analysis Techniques - This required core course in the Doctor of Philosophy program is intended to provide the student with the basis to search, retrieve, and manipulate statistical data. It provides an underpinning for the understanding of research methods and findings, and supports clinical scholarship practice. 4 credit hours.

NUR 781. Clinical Research Protocols - Developing and Testing Clinical Research Protocols - Protocols are guidelines for systematic implementation of a procedure or routine. Research protocols are important in that they: permit tracking of study procedures, decrease study treatment variation, minimize bias, facilitate communication among investigative team members and enhance dissemination and replication of study procedures. This online course is designed to provide research coordinators and new investigators with the knowledge and experience of developing, testing and refining clinical research protocols. Samples of protocols from actual clinical studies will be used to illustrate protocol design and

testing issues. 2 credit hours.

NUR 790. Independent Study in Nursing – 1 - 9 credit hours.

NUR 791. Independent Study in Clinical Nursing – 1 - 9 credit hours.

NUR 798. Research Practicum - The practicum is a series of course credits taken throughout the student's doctoral coursework to provide continuous research experience under the supervision of the mentor. 1 - 9 credit hours.

NUR 799. Dissertation Research - Prerequisites: Comprehensive Examination and admission to candidacy. 1 - 9 credit hours.

D.N.P.

Course Descriptions

CORE REQUIREMENTS

NUR 731. Philosophical, Theoretical and Conceptual Foundations - . This required core course for the Doctor of Nursing Practice program provides an understanding of the use of theory and conceptual foundations to guide the complexity of specialty nursing practice at the doctoral level. The content is derived from the philosophical and scientific underpinnings of nursing, natural, and psycho-social sciences. 3 credit hours. (on-line) **(Essential I)**

NUR 732. Design and Statistical Methods for Advanced Nursing Practice - This required course for the Doctor of Nursing practice program provides the student with the basis to search, retrieve, and manipulate statistical data. The focus of this course is on quantitative methodologies, research design, and data analysis. The content provides essential knowledge for the evaluation of research to guide evidence-based nursing practice at the highest level. 3 credit hours **(Essential III).**

NUR 733. Informatics for Advanced Practice Nursing - This course focuses on the collection, organization, analysis, and dissemination of information in nursing and health care. Students are introduced to the specialty of nursing informatics, the information system life-cycle, telemedicine, and the use of technology to enhance nursing care delivery and patient safety. Also, students learn how to design, use, and manipulate large and small patient databases for the analysis of patient outcomes. 3 credit hours **(Essential IV).**

NUR 734L. Advanced Experiential Clinical Course - This course provides the opportunity for DNP students to demonstrate excellence in providing complex care and leadership in healthcare settings. 1 – 6

credit hours **(Essential IV).**

NUR 735. Population Health in Advanced Practice - This course for the Doctor of Nursing Practice program prepares the student to implement specialty population-based disease prevention and health promotion activities to achieve national and international goals of improving worldwide health status. The course focuses on a spectrum of issues affecting health, which include emerging infectious diseases, emergency preparedness, disparities in health and healthcare services, and the impact of behavior and lifestyle choices on health. 3 credit hours **(Essentials V and VII).**

NUR 736. Application of Best Practices - This required course in the Doctor of Nursing Practice program prepares the student to evaluate interdisciplinary clinical and health systems for best practices and outcomes in the specialty area. Students acquire the knowledge, skills, and tools to support, promote, and implement evidence-based specialty practice in nursing and health care delivery systems to improve health outcomes. Emphasis will be placed upon the synthesis, critique, and application of evidence to support quality clinical and organizational practices. 4 credit hours. **(Essentials II, III, and IV)**

NUR 737. Interdisciplinary Leadership and Role Development for Practice Excellence -This required course in the Doctor of Nursing Practice program prepares students for organizational and systems leadership and knowledge and skills critical to role development in independent and inter and intra-disciplinary practice. Content includes communication, conflict resolution, collaboration and negotiation, leadership, and team functioning to maximize success in the establishment of safe, effective patient-centered care in complex environments. 3 credit hours. **(Essentials I, II, III, and V)**

NUR 738L. Scholarly Project Development Seminar - This required course is designed to assist the student in selecting an area of interest within a practice specialization, and in demonstrating professional competencies related to an area of interest. The student will document previously acquired abilities and competencies in a professional portfolio. Students will participate in the seminar to obtain guidance, be involved in discussion, and receive peer suggestions about the portfolio and practice plans. 2 credit hours **(Essential 1)**

NUR 739L. Scholarly Practice Project - This required course is the capstone clinical course in all advanced practice tracks. The student presents evidence of achievements and competencies in a professional portfolio. The practice residency is completed in a specialty area of the student's choice. One credit hour of each semester of the residency is devoted to classroom seminar. The seminar focuses on the aspects of the final practice project and interventions that promote health, prevent illness and disability, and alleviate health disparities. Small group sessions are formed for students who are at similar stages of completion of the course requirements. The final project is selected and planned by the student

and the advisor and is implemented during this course. The student completes the project, evaluates the outcomes, disseminates the findings, and makes a formal, scholarly presentation to faculty and peers. 1 – 7 credit hours. (**Essentials I, VIII)**

NUR 740. Health Policy and Politics: Implications in Health Care - This required core course in the Doctor of Nursing Practice program focuses on the basic principles of health policy and the influence of the political process as a systematic approach to health care in the United States and internationally. The course prepares students to assume complex leadership roles in order to advance specialty practice and health. This course focuses on the unique challenges of engaging and influencing health care policy in the U.S. and internationally. It is designed to develop skills, techniques, and approaches to the critical analysis of health policy proposals, health policies, and related issues from the perspective of consumers, nursing, other health professions, and other stakeholders in policy and public forums. The health policy framework is analyzed from a governmental, institutional, and organizational perspective. 3 credit hours. **(Essentials I, II, III and V).**

Nurse Anesthesia

Course Descriptions

NA 600. Research Methods and Statistics - This online course will introduce the student to clinical research methods and review concepts involved in descriptive and inferential Statistics. Topics covered include, overview of the research process, literature review, research hypothesis, research designs, sample selection, measurements methods, descriptive statistics, and inferential statistics. 3 credit hours.

NA 601. Gross Anatomy - Structure and function of human body examined through laboratory dissection, lecture, models, and preceptorials. Laboratory sessions complement lecture presentations through regional dissection of thorax, abdomen, pelvis, perineum, back, and extremities with special emphasis on head and neck. Emphasis on radiological anatomy and clinical correlations. 4 credit hours.

NA 620. Anesthesia Pharmacology I - This course is designed to provide the nurse anesthesia student with knowledge of various non-anesthetic pharmacological agents and their anesthetic implications. This is accomplished through lectures, presentations, and reading assignments.
5 credit hours.

NA 621. Anesthesia Pharmacology - II This course is designed to provide the nurse anesthesia student with a basic pharmacologic foundation of medications used during an anesthetic. Included are the pharmacokinetics, pharmacodynamics, doses, side effects, uses and effects on various patient populations. This is accomplished through lectures, presentations, and reading assignments. 3 credit

hours.

NA 630. Nurse Anesthesia Biochemistry - Chemistry and metabolism of biologically important compounds and common pathways of metabolism. Regulation and chemical structure of electrolytes, pH balance, and biochemical nutrition. 3credit hours.

NA 640. Anesthesia Principles - Principles and theories of anesthesia practice and also the study of basic principles and monitoring techniques as they relate to the delivery of anesthesia. Topics will include mechanisms of anesthesia equipment, methods of patient monitoring, fundamental concepts related to the practice of anesthesia , review of airway and various patient monitoring techniques that the student will need in order to provide anesthesia. 5 credit hours.

NA 645. Professional Aspects of Anesthesia - Psychosocial, ethical, and legal aspects, department organization and management and history of anesthesia. 2 credit hours.

NA 646. Legal Issues and Practice Management - Anesthesia - This online course review(s) the malpractice and quality assurance concerns in the practice of anesthesia. Emphasis on how to avoid malpractice suits through appropriate departmental quality assurance programs. 1 credit hour.

NA 650. Regional Anesthesia - Commonly used regional techniques including spinals, epidurals, upper extremity blocks to include brachial plexus and bier blocks, and ankle blocks in relation to technique, positioning and pharmacology of local anesthetics. 2 credit hours.

NA 660. Obstetrical Anesthesia - Online course is of the basic concepts concerning physiological changes that accompany pregnancy and their implication on anesthesia management of pregnant patients. 1 credit hour.

NA 661. Anesthesia for Extremes of Age - This online course focuses on the principles of anesthetic management in the pediatric and geriatric patient. 3 credit hours.

NA 670. Anesthesia Pathophysiology I - Detailed review of disease and major systems with emphasis on pulmonary and cardiovascular systems. Specialized or advanced anesthetic management techniques for physiological and pathological states encountered in surgical patient
3 credit hours.

NA 671. Anesthesia Pathophysiology II - Continuation of NA 670 Major system emphasis on renal, endocrine, neurological, musculoskeletal, and gastrointestinal systems.
3 hours.

NA 672. Clinical Practicum I- Operating room experience providing for application of theoretical principles of anesthesia management. Clinical course sequence provides anesthesia care for more complex surgical procedures. 6 credit hours.

NA 673. Clinical Practicum II- Operating room experience providing for application of theoretical principles of anesthesia management. Clinical course sequence provides anesthesia care for more complex surgical procedures. 12 credit hours

NA 674. Clinical Practicum III - Operating room experience providing for application of theoretical principles of anesthesia management. Clinical course sequence provides anesthesia care for more complex surgical procedures. 12 credit hours.

NA 675. Clinical Practicum IV - Operating room experience providing for application of theoretical principles of anesthesia management. Clinical course sequence provides anesthesia care for more complex surgical procedures. 11 credit hours.

NA 676. Clinical Practicum V - Operating room experience providing for application of theoretical principles of anesthesia management. Clinical course sequence provides anesthesia care for more complex surgical procedures. 10 credit hours.

NA 678. Advanced Electrocardiography. Supplements content from pathophysiology and advanced practice courses relative to cardiovascular electrophysiology and its implication in perioperative period. 1 hours

NA 680. Anesthesia and Surgical Specialties - Review of major surgical specialties with emphasis on orthopedic, neurological, ENT, head and neck, gynecological, thoracic, open heart/vascular, urological, transplant and plastic procedures. Advanced anesthetic management technique for specialized surgical procedures. 3 credit hours

NA 695. Special Topics - Review of specialty concepts as presented in NA 670,671, and 680. 3 credit hours.

NA 696. Special Topics - Review of specialty concepts as presented in NA 670,671, and 680. 3 credit hours.

NA 697. Special Topics - Review of specialty concepts as presented in NA 670,671, and 680. 3 credit hours.

NA 698. Graduate Project. Plan, organize, synthesize and execute a state of the art paper on some relevant topic in anesthesia that meets the qualifications for submission to a peer reviewed journal. 2 credit hours

MSN

Course Descriptions

CRM 670. Clinical Research Ethics, Methods and Clinical Trials – This course provides clinical research personnel and advanced practice nurses with an introduction to historical, cultural, and ethical influences on clinical research, and introduces concepts related to good clinical practice guidelines. The course also addresses concepts of scientific integrity, scientific misconduct, the informed consent process, research methods and clinical trials. 3 credit hours.

CRM 671. Clinical Research Study Operations and Site Management – This course provides clinical research personnel and advanced practice nurses with an introduction to principles of study and site management for the development, implementation and evaluation of clinical research, and expands concepts related to good clinical practice guidelines. 3 credit hours.

CRM 672. An Overview of Teaching Principles for Clinical Research Coordinators and Healthcare Professionals – This course provides clinical research personnel and advanced practice nurses with an introduction and overview of teaching principles that are applicable to clinical and clinical research venues. 3 credit hours.

CRM 673. Current Issues in Clinical Research Management – This course provides students with an opportunity to expand critical learning and application of clinical research management topics through review of current literature and use of available resources. Prerequisite: CRM 670, CRM 671 and CRM 672. 3 credit hours.

CRM 674L. Practicum Experiences in Clinical Research Management – This course provides students with an opportunity to expand learning experiences that validate cognitive, affective and psychomotor skill sets of CRMs; and includes an opportunity to develop additional learning objectives and practicum experiences that will culminate in a project that fulfills learning goals. Prerequisite: CRM 670, CRM 671 and CRM 672. 3 credit hours.

NAH 621. Advanced Adult Nursing I - This course provides a theoretical and practical base for students to diagnose and manage health problems of adults. Content includes management strategies

from the domains of nursing, medical, and pharmacological therapeutics, and emphasizes direct care to clients. The course utilizes a lecture/discussion and case study format to assist the student in clinical assessment and decision-making to provide direct patient care to adult clients within the scope of practice of adult nurse practitioners. The student is expected to apply the concepts and theories discussed in class to the care of adult clients during the clinical course taken in conjunction with this course. The following elements are integrated into this course: critical thinking, health promotion and disease prevention, research, ethics, cultural diversity, and social issues. Prerequisite: NUR 614L.Corequisite: NAH 685L. 4 credit hours.

NAH 622. Advanced Adult Nursing II - This course is designed to provide the student with opportunities to integrate in-depth knowledge of health assessment and management skills to provide care for adults with commonly occurring chronic and complex health problems. Students will also have the opportunity to develop strategies to market the nurse practitioner role, to create a specific practice position, and to explore strategies to market their role in adult health care. The following elements are integrated into the course: critical thinking, health promotion and disease prevention, scientific integrity and ethics, human diversity and social issues, and professional role development. Prerequisite: NAH 621 and NAH 685L. Corequisite: NAH 686L. 4 credit hours.

NAH 685L. Practicum I: Adult Nurse Practitioner - This course allows the student to develop the Adult Nurse Practitioner role by providing health care services to clients (i.e., individuals, families, groups) and emphasizing the promotion of health and the prevention of disease throughout the course of clinical experiences. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. It is anticipated that the student will be increasingly independent and skilled as the clinical experience progresses, allowing him/her to become more proficient and to contribute to the management of more complex adult health problems. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity, and social issues. The advanced practice role emphasis in this course encompasses a trajectory of the nurse practitioner experience from novice to beginning expert, and includes role components such as interdisciplinary collaborator, coach, educator, and consultant. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NUR 614L. Corequisite: NAH 621. 2 - 3 credit hours.

NAH 686L. Practicum II: Adult Nurse Practitioner - This course allows the student to develop the Adult Nurse Practitioner role by providing health care services to clients (i.e., individuals, families, groups) and emphasizing the promotion of health and the prevention of disease throughout the course of clinical

experiences. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. It is anticipated that the student will be increasingly independent and skilled as the clinical experience progresses, allowing him/her to contribute more toward the management of health problems. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity and social issues. The advanced practice role emphasis in this course encompasses a trajectory of the nurse practitioner experience from novice to beginning expert, and includes role components such as interdisciplinary collaborator, coach, educator, and consultant. An Objective Structured Patient Experience held during this course will determine if the student can progress into 6 hours of the final residency course, NAH 692L. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NAH 621 and NAH 685L. Corequisite: NAH 622. 2- 3 credit hours.

NAH 692L. Residency: Adult Nurse Practitioner - This course prepares the student in the Adult Nurse Practitioner role to be a beginning expert in the diagnosis and management of adult patient problems. In the residency, the student is expected to continue growth toward becoming an independent practitioner, specializing in the care of adults. The student further develops the adult NP role with patients/clients by providing ambulatory health care services to clients (i.e. individuals, families, groups), emphasizing the promotion of health and the prevention of disease. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NAH 622 and NAH 686L. 2- 6 credit hours.

NCA 616. Diagnostic and Therapeutic Procedures I for Advanced Nursing Practice - This course is designed to provide the student with opportunities to obtain advanced knowledge of and to learn advanced clinical skills in diagnostic or therapeutic procedures related to the role of the advanced practice nurse in acute and critical care. Specific content and skills in this course will focus on procedures associated with diagnostic and evaluative monitoring of acutely or critically ill patients. Corequisite: NCA 621. 2 credit hours.

NCA 617. Diagnostic and Therapeutic Procedures II for Advanced Nursing Practice - This course is designed to provide the student with opportunities to obtain advanced knowledge of and to learn advanced clinical skills in diagnostic or therapeutic procedures related to the role of the advanced practice nurse in acute and critical care. Specific content and skills in this course will focus on therapeutic

procedures commonly used in the acute and critical care setting. Corequisite: NCA 622. 1 credit hour

NCA 621. Advanced Adult Acute Care Nursing I - This course provides a theoretical and practical base for students to diagnose and manage health problems of adults with health problems ranging through primary, acute, and critical care settings. Content includes management strategies from the domains of nursing, medicine, and pharmacological therapeutics, and emphasizes direct care to clients. The course assists the student in the clinical assessment and decision-making to provide direct patient care to adult patients within the scope of practice of acute care nurse practitioners. The student is expected to apply the concepts and theories discussed in class to the care of adult patients during the clinical course taken in conjunction with this course. The following elements are integrated into this course: critical thinking, health promotion and disease prevention, research, ethics, cultural diversity, social issues, and professional role development. Prerequisite: NUR 614L. 4 credit hours.

NCA 622. Advanced Adult Acute Care Nursing II - This course is designed to provide the student with opportunities to integrate in-depth knowledge of health assessment and management skills to provide care for adults with commonly occurring acute, chronic, and complex health problems. Students will also have the opportunity to develop strategies to market the acute care nurse practitioner role, to create a specific practice position, and to explore strategies to market their role in acute and critical care. The following elements are integrated into the course: critical thinking, health promotion and disease prevention, scientific integrity and ethics, human diversity and social issues, and professional role development. Prerequisite: NCA 621. 3 credit hours.

NCA 623. Advanced Adult Acute Care Nursing III - This course is designed to provide the adult acute and continuing care student with opportunities to integrate in-depth knowledge of health assessment and management skills to provide care for adults with commonly occurring acute, chronic and complex health problems. Content includes management strategies from the domains of nursing, medicine and pharmacology and emphasizes direct care to patients with health problems in the renal and gastrointestinal systems. Also, emphasized are common acute care problems associated with nutrition, cancer and oncologic emergencies, pain, palliative care, poisonings and toxicities, burns, trauma, sepsis, shock and multisystem organ failure. Prerequisite: NCA 622. 3 credit hours.

NCA 685L. Practicum I: Adult Acute Care Nurse Practitioner - This course allows the student to develop the Adult Acute and Continuing Care Nurse Practitioner role by providing health care services to adult clients (i.e., individuals, families, groups) and emphasizing the promotion of health and the prevention of disease throughout the course of clinical experiences. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. It is anticipated that the

student will be increasingly independent and skilled as each clinical experience progresses, allowing him/her to become proficient and to contribute to the management of more complex adult health problems. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity and social issues. The advanced practice role emphasis in this course encompasses a trajectory of the nurse practitioner experience from novice to beginning expert, and includes role components such as interdisciplinary collaborator, coach, educator, and consultant. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NUR 614L. Corequisite: NCA 622. 1- 3 credit hours.

NCA 686L. Practicum II: Adult Acute Care Nurse Practitioner - This course allows the student to develop the Adult Acute and Continuing Care Nurse Practitioner role by providing health care services to adult clients (i.e. individuals, families, groups) in acute and critical care settings and emphasizing the promotion of health and the prevention of disease. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. It is anticipated that the student will be increasingly independent and skilled as each clinical experience progresses, allowing him/her to become proficient and to contribute to the management of more complex adult health problems. Prior to enrollment the student, in conjunction with the advisor, must secure an approved clinical preceptor. An Objective Structured Patient Experience held during this course will determine if the student can progress into 6 hours of the final residency course, NCA 692L. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NCA 685L. Corequisite: NCA 623 1- 3 credit hours.

NCA 692L. Residency: Adult Acute Care Nurse Practitioner - This course prepares the student in the Acute Care Nurse Practitioner role to be a beginning expert in the diagnosis and management of patients' health problems. In the residency, the student is expected to continue growth toward becoming an independent practitioner, specializing in the care of adults with health problems requiring primary, acute, and critical care management. The student further develops the Acute Care Nurse Practitioner role with patients/clients by providing health care services to clients (i.e. individuals, families, groups), emphasizing the promotion of health and the prevention of disease. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity, and social issues. The advanced practice role emphasis in this course continues the trajectory of the nurse practitioner experience from novice to beginning expert, and includes role

components such as interdisciplinary collaborator, coach, educator, and consultant. A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NCA 686L. 3 or 6 credit hours.

NCC 613. Acute & Continuing Care Pediatric Pharmacology - This course is a supplementary course for Acute and Continuing Care Pediatric Nurse Practitioner students to provide information necessary to safely and competently prescribe medications for infants, children and adolescents. It complements the information provided in NUR 613 Pharmacology and Therapeutics but focuses on the unique physiologic and metabolic characteristics of the pediatric population. 1 credit hour.

NCC 621. Child/Adolescent Advanced Nursing I - This course provides a theoretical and practical base for students to diagnose and manage acute and continuing health problems of children and adolescents. Content includes management strategies from the domains of nursing, medicine, and pharmacological therapeutics, and emphasizes direct care to children, adolescents, and their families. This course assists the student in clinical assessment and decision-making to provide direct patient care to children, adolescents, and their families within the scope of practice of acute care child/adolescent nurse practitioners. Prerequisite: NUR 614L. Corequisite: NCC 685L. 4 credit hours.

NCC 622. Child/Adolescent Advanced Nursing II Acute and Continuing Care Nurse Practitioner - This course is designed to provide the students with the opportunities to integrate in-depth knowledge of management of acute and continuing health care problems, family crises, case management, education and consultation roles and skills and procedures required by children, adolescents, and their families who experience chronic, complex and life-threatening health problems. Students will have the opportunity to develop strategies to present information about acute and continuing health care problems to peers and colleagues. Prerequisite: NCC 621 and NCC 685L. Corequisite: NCC 686L. 2 credit hours.

NCC 623. Child/Adolescent Advanced Nursing III Acute and Continuing Care Nurse Practitioner - This course is designed to provide the students with opportunities to integrate in-depth knowledge of management of acute and continuing health care problems, family crises, case management, consultation roles and skills and procedures required by children, adolescents and their families who experience chronic, complex and life-threatening health problems. Students will have the opportunity to develop strategies to present information about acute and continuing health care problems to peers and colleagues. The following elements are incorporated into the course: critical thinking, crisis management, health promotion and disease prevention, scientific integrity and ethics, human diversity, cultural competence, social issues and professional role development. Prerequisite: NCC 622 and NCC

686L. Corequisite: NCC 688L. 4 credit hours.

NCC 685L. Practicum I: Child/Adolescent Acute and Continuing Care Nurse Practitioner - This course prepares the student in the Child/Adolescent Acute & Continuing Care Nurse Practitioner role. The student develops the NP role with patients/clients by providing health care to individual children, adolescents, families and groups at any point of the continuum of health statuses in acute and continuing care settings. The student continues to apply knowledge an current research findings to the management of actual and potential health problems, which include acute and chronic health problems and human responses to disease in children, adolescents and their families. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NUR 614L. Corequisite: NCC 621. 2 credit hours.

NCC 686L. Practicum II: Child/Adolescent Acute & Continuing Care Nurse Practitioner - This course assists the student in further refining and developing the Child/Adolescent Acute and Continuing Care Nurse Practitioner role. The student develops the NP role with patients/clients by providing health care to individual children, adolescents, families and groups at any point of the continuum of health statuses in acute and continuing care settings. The student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include acute and chronic health problems and human responses to disease in children, adolescents and their families. Prerequisite: NCC 621 and NCC 685L. -Corequisite: NCC 622. 2 credit hours.

NCC 688L. **Child/Adolescent Acute and Continuing Care Nurse Practitioner Practicum III –** This course prepares the student in the Pediatric Nurse Practitioner role. The student develops the Pediatric NP role with patients/clients by providing pediatric health care services to clients (i.e. individuals, families, groups) emphasizing the promotion of health and the prevention of disease throughout the course of clinical experiences over two or three academic terms. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. It is anticipated that the student will be increasingly independent and skilled as each clinical experience progresses, allowing him/her to become more proficient and to contribute to the management of more complex health problems. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity and social issues. The advanced practice role emphasis in this course encompasses a trajectory of the nurse practitioner experience from novice to beginning expert, including interdisciplinary collaboration, coach, educator, consultant roles. Prerequisite: NCC 622 and NCC 686L. Corequisite: NCC 623. 2 credit hours.

NCC 692L. Residency: Child/Adolescent Acute/Continuing Care Nurse Practitioner - This course

prepares the student in the Child/Adolescent Acute and Continuing Care Nurse Practitioner role to be a beginning expert in the diagnosis and management of child/adolescent health problems. In the residency, the student is expected to continue growth toward becoming both an autonomous and collaborative practitioner, specializing in the care of acutely and chronically ill children. The student further develops the Child/Adolescent Acute and Continuing NP role by providing health care services to children, adolescents and their families individually and in acute care and community settings, emphasizing the level of care that is appropriate to their current health statuses. Students arrange their own clinical sites with assistance/approval from clinical faculty. A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation. Prerequisite: NCC 623 and NCC 688L. 3 - 6 credit hours.

NCL 620. Systems in Population-based Care I - This course is designed to provide the student with opportunities to integrate in-depth knowledge of theoretical and practical concepts required to measure and improve healthcare quality, outcomes and safety. The student will focus on 5 roles required for the beginning Clinical Nurse Leader: Clinician, Member of Profession, Interdisciplinary Healthcare Team Manager, Outcomes Manager and Lifelong Learner. The course explores theories of change, complexity, horizontal and lateral leadership, microsystems and decision-making and their relationship to nursing and the health care system. The following elements are integrated into this course: critical thinking, research, scholarly writing, scientific integrity, ethics, cultural diversity, and social issues. Prerequisite: NUR 600 and NUR 643. Corequisite: NCL 685L. 3 credit hours.

NCL 621. Systems in Population-based Care II - This course is designed to provide the student with opportunities to develop additional knowledge of theoretical and practical concepts required to measure and improve healthcare quality, outcomes and safety. The student will focus on the four additional roles required for the beginning Clinical Nurse Leader: Information Manager, Systems Analyst/Risk Manager, Advocate, and Educator. The student will be expected to expand proficiency of previously learned Clinical Nurse Leader roles: Clinician, Member of a Profession, Team Manager, Outcomes Manager and Lifelong Learner. At the completion of this course the student will have explored all of the nine CNL roles as defined by the American Association of Colleges of Nursing's White Paper. The following elements are integrated into this course: critical thinking, research, scholarly writing, professional presentation, scientific integrity and ethics, cultural diversity, and social issues. Prerequisite: NCL 620 and NCL 685L. Corequisite: NCL 686L 3 credit hours.

NCL 685L. Clinical Nurse Leader Practicum I – This course provides the student, at an introductory level, the opportunity to observe and apply in a clinical setting five of the nine CNL role functions: Clinician, Member of a Profession, Team Manager, Outcomes Manager and Lifelong Learner. The

student will use these skills to focus on improving quality of care and patient safety. The student will be expected to utilize principals of critical thinking, evidence based research, scientific integrity and ethics, cultural diversity, and social issues to achieve above objectives. Prerequisite: NUR 600 and NUR 643. Corequisite: NCL 620. 2 credit hours

NCL 686L. Clinical Nurse Leader Practicum II – Building on the preceding practicum, this course provides the student the opportunity to observe and apply in a clinical setting the remaining four of the CNL role functions. This course will focus on the student developing the CNL roles of information manager, systems analyst/risk manager, advocate, and educator. The student will be expected to expand proficiency of the previous CNL roles of clinician, professional, interdisciplinary team manager, outcomes manager and lifelong learner. The student will use this knowledge and skill to evaluate, design and implement interventions to improve quality of care and patient safety. At the completion of this course the student will have explored all of the nine CNL roles as defined by the American Association of Colleges of Nursing's White Paper. Prerequisite: NCL 620 and NCL 685L. Corequisite: NCL 621. 2 credit hours

NCL 692L. Clinical Nurse Leader Capstone Practicum – This course provides the student the opportunity to integrate and apply in an intensive clinical rotation the nine CNL roles. The student will be expected to expand their proficiency in the roles of advocate, professional, team manager, information manager, systems analyst/risk manager, clinician, outcomes manager, educator and lifelong learner. The student will use these skills to design, implement, evaluate, and disseminate plans of care to improve quality and patient safety. At the completion of this course the student will demonstrate, at novice level, the nine CNL roles as defined by the American Association of Colleges of Nursing's White Paper. Prerequisite: NCL 621 and NCL 686L. 5 credit hours

NCS 616. Foundations of Clinical Nurse Specialist Practice - This graduate specialty course is designed to give the Clincial Nurse Specialist student the theoretical underpinnings of the role of the CNS. Parameters of Clincial Nurse practice will be explored through discussion and in-class simulations of practice dilemmas. Course work will include information on the background of the Clinical Nurse Specialist, information on the logistics of advanced practice as it relates to the CNS role, and information on devising assessment strategies for practice problems. This course includes integration of critical thinking, scholarly writing, human diversity, ethics, health care economics and social issues. 1 credit hour.

NCS 617. Phenomenon of Concern to Advanced Practice Nurses - This graduate specialty course focuses on phenomena of concern to advanced practice nurses and is designed to give the Clinical Nurse Specialist student the theoretical underpinnings of selected non-disease based causes of illness.

Clinical/didactic information regarding symptoms, functional problems and risk behaviors will be included to assist the student operationalize the role of the CNS in the patient/client sphere of influence, the nurse/nursing service sphere of influence and the organization sphere of influence. 1 credit hour.

NCS 685L. Practicum I: Clinical Specialization in Adult Health Nursing - This course is the first clinical practicum in the Clinical Nurse Specialist option. The student is provided the opportunity to develop the CNS role with a focus on the care of non-disease based etiologies of symptoms, functional problems, and risk behaviors among patients/ clients within a defined specialty. This practicum may include experiences in outpatient or inpatient settings. The student is expected to design evidence-based interventions for acute and/or chronic health problems commonly occurring within a defined specialty area. The following elements are integrated into this course: critical thinking, health promotion and disease prevention, research, ethics, cultural diversity, and social issues. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NUR 614L. Corequisite: NCA 621. 1 - 2 credit hours.

NCS 686L. Practicum II: Clinical Specialization in Adult Health Nursing - This course further prepares the student in the Clinical Nurse Specialist role. The student continues to apply knowledge and current research findings to the management of selected acute and chronic health problems commonly occurring in the target population. While focusing on the care of acutely ill clients, the student develops the CNS role with nursing personnel through identifying and defining problems and opportunities; identifying and articulating factors contributing to resource management needs and outcomes; developing innovative solutions; and evaluating the effect of solutions. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NCA 621 and NCS 685L. Corequisite: NCA 622. 1 - 2 credit hours.

NCS 687L. Practicum III: Clinical Specialization in Adult Health Nursing - This course further prepares the student in the Clinical Nurse Specialist role. The student continues to apply knowledge and current research findings to the management of selected acute and chronic health problems commonly occurring in the target population. While focusing on the care of acutely ill clients, the student develops the CNS role with nursing personnel through identifying and defining problems and opportunities; identifying and articulating factors contributing to resource management needs and outcomes; developing innovative solutions; and evaluating the effect of solutions. An Objective Structured Patient Experience held during this course will determine if the student can progress into 6 hours of the final residency course, NCA 692L. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NCS 686L. Corequisite: NCA 623. 1 - 2 credit hours.

NCS 692L. Residency in Clinical Specialization - This course is the culminating experience for the

student to practice in the role of the CNS. This course emphasizes the application of previously learned theories and knowledge from nursing and other disciplines. The student will implement the role of the CNS to manage the health care of adult clients, teaching, nurses and clients, discussing employment issues and evaluating products for use in clinical practice. Students arrange their own clinical sites with assistance/approval from clinical faculty. A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation. Prerequisite: NCA 623 and NCA 687L. 2 - 4 credit hours.

NCV 630. Advanced Cardiovascular Nursing - This course is designed to provide a conceptual base for student to diagnose and treat human responses to actual and/or potential cardiovascular health problems with concomitant biophysical, psychological, sociocultural and spiritual environmental variables. Emphasis is placed on patients with cardiovascular health problems and the selection and utilization of concepts and theories relevant to advanced cardiovascular nursing. Political influences on cardiovascular health are explored. May be taken as an elective. 3 credit hours.

NCV 631. Electrocardiography for Advanced Nursing Practice - Concepts presented in the course include the biophysical, psychological, developmental, and adaptive nature of the human being as it relates to the formation, function, and regulation of the cardiac electrical system. Concepts of cardiovascular adaptation to biophysical and psychosocial variables are emphasized. Explanations for electrophysiologic and electrocardiographic phenomena are offered, as are nursing and medical interventions for cardiac electrical abnormalities. Content focuses on the concepts of electrophysiology and electrocardiography, interpreting cardiac electrical abnormalities, and analyzing the various medical and nursing therapies for the electrical abnormalities and their applications to the practice of advanced nursing. May be taken as an elective. 3 credit hours.

NDP 613. Dual Option Pediatric Pharmacology – This course is a supplement to the current pharmacology course, NUR 613, required of all MSN Advanced Practice students. The content is specific to infants, children and adolescents with their unique physiologic and metabolic characteristics. Pre or corequisite: NUR 613, 2 credit hours. **NDP 621. Dual Option Advanced Pediatric Nursing I -** This course provides a theoretical and practical base for students to diagnose and manage primary, acute, and continuing health problems of children and adolescents. Content includes management strategies from the domains of nursing, medicine, and pharmacological therapeutics, and emphasizes direct care to children, adolescents and their families. This course utilizes a on-line lecture/discussion and case study format to assist the student in the clinical assessment and decision-making to provide direct patient care to children, adolescents and their families within the scope of practice of primary and acute care child/adolescent nurse practitioners. The student is expected to apply the concepts and theories

discussed in class to the care of children and adolescents during the clinical course taken in conjunction with this course. The following elements are integrated into this course: critical thinking, crisis management, health promotion and disease prevention, research, ethics, cultural diversity, cultural competence, and social issues. Prerequisite: NUR 614L. Corequisite: NDP 685L. 5 credit hours.

NDP 622. Dual Option Advanced Pediatric Nursing II - This course is designed to provide the students with opportunities to integrate in-depth knowledge of management of acute and continuing health care problems, family crises, case management, education and consultation roles and skills and procedures required by children, adolescents and their families who experience chronic, complex and life-threatening health problems. Students will have the opportunity to develop strategies to present information about acute and continuing health care problems to peers and colleagues. The following elements are incorporated into the course: critical thinking, crisis management, health promotion and disease prevention, scientific integrity and ethics, human diversity, cultural competence, social issues and professional role development. Prerequisite: NDP 621 and NDP 685L. Corequisite: NDP 686L. 5 credit hours.

NDP 623. Dual Option Advanced Pediatric Nursing III - This course provides a theoretical and practical base for students to diagnose and manage chronic health problems of children and adolescents. Additionally, students will be provided with opportunities to integrate in-depth knowledge of management of chronic health care problems, family crises, case management, education and consultation roles and skills and procedures required by children, adolescents and their families who experience chronic, complex health problems. Content includes management strategies from the domains of nursing, medicine, and pharmacological therapeutics, and emphasizes direct care to children, adolescents and their families. This course utilizes an on-line lecture/discussion and case study format to assist the student in the clinical assessment and decision-making to provide direct patient care to children, adolescents and their families within the scope of practice of primary and acute care pediatric nurse practitioners. Students will have the opportunity to develop strategies to present information about chronic health care problems to peers and colleagues. The student is expected to apply the concepts and theories discussed in class to the care of children and adolescents during the clinical course taken in conjunction with this course. The following elements are integrated into this course: critical thinking, crisis management, health promotion and disease prevention, research, ethics, cultural diversity, cultural competence, and social issues. Prerequisite: NDP 622 and NDP 686L. Corequisite: NDP 687L. 5 credit hours.

NDP 685L. Practicum I: Dual Option Pediatric Nurse Practitioner – This prepares the student in the Dual Option Pediatric Nurse Practitioner role. The student develops the NP role with patients/clients by

providing health care to individual children, adolescents, families, and groups at any point of the continuum of health statuses in acute and continuing care settings. The student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include acute and chronic health problems and human responses to disease in children, adolescents and their families. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity, cultural sensitivity and social issues. The advanced practice role emphasis in this course provides experiences for the developing Dual Option Pediatric Nurse Practitioner including interdisciplinary collaboration, case management, educator, and consultant roles. Prerequisite: NUR 614L. Corequisite: NDP 621. 3 credit hours.

NDP 686L. Practicum II: Dual Option Pediatric Nurse Practitioner – This course prepares the student in the Pediatric Nurse Practitioner role. The student develops the Pediatric NP role with patients/clients by providing pediatric health care services to clients (i.e. individuals, families, groups) emphasizing the promotion of health and the prevention of disease throughout the course of clinical experiences over two or three academic terms. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. It is anticipated that the student will be increasingly independent and skilled as each clinical experience progresses, allowing him/her to become more proficient and to contribute to the management of more complex health problems. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity and social issues. The advanced practice role emphasis in this course encompasses a trajectory of the nurse practitioner experience from novice to beginning expert, including interdisciplinary collaboration, coach, educator, consultant roles. Prerequisite: NDP 621 and NDP 685L. Corequisite: NDP 622. 3 credit hours.

NDP 687L. Practicum III: Dual Option Pediatric Nurse Practitioner – This course prepares the student in the Dual Option Pediatric Nurse Practitioner role. The student develops the NP role with patients/clients by providing health care to individual children, adolescents, families, and groups at any point of the continuum of health statuses in acute and continuing care settings. The student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include acute and chronic health problems and human responses to disease in children, adolescents and their families. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity, cultural sensitivity and social issues. The advanced practice role emphasis in this course provides experiences for the developing Dual Option Pediatric Nurse Practitioner including interdisciplinary collaboration, case

management, educator, and consultant roles. Prerequisite: NDP 622 and NDP 686L. Corequisite: NDP 623. 3 credit hours.

NDP 692L. Residency: Dual Option Pediatric Nurse Practitioner - This course prepares the student in the Pediatric Nurse Practitioner role to be a beginning expert in the diagnosis and the management of pediatric patient problems. In the residency, the student is expected to continue growth toward becoming an independent practitioner, specializing in the care of children. The student further develops the pediatric NP role with patients/clients by providing pediatric health care sevices to clients (i.e. individuals, families, groups) emphasizing the promotion of health and the prevention of disease. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. Prerequisite: NDP 623 and NDP 687L. 4 – 8 credit hours.

NFA 620. Surgical Techniques - This course will focus on the expanded functions unique to the RNFA role during operative and invasive procedures. The course includes the recommended content of the Core Curriculum for the RN First Assist and is designed to develop the beginning knowledge and skills needed for safe RNFA practice. Surgical practice and techniques such as sterile technique, positioning and draping, using instruments and medical devices, providing exposure, handling and cutting tissue, providing hemostasis, and suturing will be emphasized in a “hands on” swine laboratory experience. The course will be taught in a blended distance accessible format and on campus 4-5 day intensive session in an animal surgical laboratory. This format will enable each student to apply surgical principles and techniques to a swine surgical model. Students without operating room experience will be required to take the 4 credit hours (5 day intensive) and students with operating room experience will take 3 credit hours (4 day intensive). Admission to the ACNP/RNFA graduate program or RNFA post masters option required. 3 - 4 credit hours.

NFA 621. Advanced Perioperative Nursing I - This course prepares the advanced perioperative student to develop a theoretical knowledge base for advanced perioperative nursing. The course includes the recommended content of the Core Curriculum for the RN First Assist and is designed to develop the theoretical knowledge needed for safe RNFA practice. Content includes an in depth review of anatomy and physiology of surgical client, and prevention of injury. Knowledge of comprehensive perioperative nursing, which serve as the foundation for critical, technical, and clinical decision making in RNFA role at the advanced level. Selective literature, which evidences best practice strategies of the RNFA role and considerations of vulnerable populations requiring surgical interventions, will also be examined in selective surgical specialties. The following elements are integrated into the course: critical thinking, research utilization, ethics, human diversity, and social issues. The advanced perioperative practice role

emphasis in this course continues the trajectory of the RNFA as a beginning expert and includes role components such as interdisciplinary collaborator, educator, and consultant. Admission to the ACNP/RNFA graduate program or RNFA post masters option required. 3 credit hours.

NFA 622. Advanced Perioperative Nursing I - This course prepares the advanced perioperative student to function in the expanded role of first assistant to the surgeon. In this practicum, the student is expected to continue to grow toward becoming a competent advanced perioperative nurse, specializing in problems requiring surgical interventions and management and the full scope of RNFA practice. Further, the student continues to apply, knowledge and current research findings to the management of actual and potential health problems, which include common surgical diseases and human responses to disease. The following elements are integrated into the course: critical thinking, research utilization, scientific integrity and ethics, human diversity, and awareness of social and professional issues. The advanced perioperative practice role emphasis in this course continues the trajectory of the RNFA as a beginning expert and includes role components such as interdisciplinary collaborator, educator, and consultant. Prerequisite: NFA 620 and NFA 621. 1 - 3 credit hours.

NFH 621. Advanced Family Nursing I - This course provides a theoretical and practical base for students to diagnose and manage health problems of clients from across the lifespan. Content includes management strategies from the domains of nursing, medical, and pharmacological therapeutics, and emphasizes direct care to clients. This course assists the student in the clinical assessment and decision-making to provide direct patient care to clients within the scope of practice of family nurse practitioners. The student is expected to apply the concepts and theories discussed in class to the care of clients and families during the clinical course taken in conjunction with this course. The following elements are integrated into this course: critical thinking, health promotion and disease prevention, research, ethics, cultural diversity, social issues, and professional role development. Prerequisite: NUR 614L. Corequisite: NFH 685L. 5 credit hours.

NFH 622. Advanced Family Nursing II - This course is designed to provide the student with opportunities to integrate in-depth knowledge of health assessment and management skills to provide care for clients with commonly occurring chronic and complex health problems. Students will also have the opportunity to develop strategies to market the nurse practitioner role, to create a specific practice position, and to explore strategies to market their role in family health care. The following elements are integrated into the course: critical thinking, health promotion and disease prevention, scientific integrity and ethics, human diversity and social issues, and professional role development. Prerequisite: NFH 621 and NFH 685L. Corequisite: NFH 686L. 4 credit hours.

NFH 685L. Practicum I: Family Nurse Practitioner - This course allows the student to develop the

Family Nurse Practitioner role by providing health care services to clients across the life span, families, and groups while emphasizing the promotion of health and the prevention of disease throughout the course of clinical experiences over two or three academic terms. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. It is anticipated that the student will be increasingly independent and skilled as each clinical experience progresses, allowing him/her to become more proficient and to contribute to the management of more complex health problems. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity, and social issues. The advanced practice role emphasis in this course encompasses a trajectory of the nurse practitioner experience from novice to beginning expert, and includes role components such as interdisciplinary collaborator, coach, educator, and consultant. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NUR 614L. Corequisite: NFH 621. 3 credit hours.

NFH 686L. Practicum II: Family Nurse Practitioner - This course allows the student to develop the Family Nurse Practitioner role by providing health care services to clients across the lifespan, families and groups while emphasizing the promotion of health and the prevention of disease. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. It is anticipated that the student will be increasingly independent and skilled, allowing him/her to become more proficient and to contribute to the management of more complex health problems, complex family issues and health care issues. An Objective Structured Patient Experience held during this course will determine if the student can progress into 6 hours of the final residency course, NCA 692L. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NFH 621 and NFH 685L. Corequisite: NFH 622. 3 credit hours.

NFH 692L. Residency: Family Nurse Practitioner - NFH 692L is the culminating experience for the student to practice in the role of a family nurse practitioner. This course emphasizes the application of previously learned theories and knowledge from nursing and other disciplines to the continued development of clinical decision making skills. The student will implement the role of the family nurse practitioner to manage the health care of clients (i.e., individuals, families, groups) in primary or acute care setting. Prior to enrollment the student, in conjunction with the advisor, must secure an approved clinical preceptor. A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NFH 622 and NFH 686L. 3 – 6 credit hours.

NGN 630. Advanced Practice Gerontology Nursing - This course is designed to provide students in all advanced practice nursing tracks with the ability to integrate knowledge of gerontology and geriatrics with other specialty knowledge concerning the management of health care of adults. The emphasis in the course is on providing students with the background to apply this knowledge with elders and their families. 2 credit hours

NGN 631. Gerontology and Geriatrics for Advanced Nursing Practice - This course is designed to provide students with the opportunity to integrate knowledge of gerontology and geriatrics with previously acquired knowledge concerning the management of health care of adults. It is the required support course for students in the gerontological nurse practitioner option and may be taken as an elective by students in other options. In this course students acquire knowledge of gerontology and geriatrics that is relevant to the nursing and medical management of health care of elders. This knowledge is applied in the required clinical course. 3 credit hours.

NGN 632. Chronic Health Conditions for Advanced Nursing Practice – This is a required support course for students in the gerontological nurse practitioner option, and may be taken as an elective by students in other options. In this course students acquire knowledge of a variety of clinical topics that are relevant to the nursing and medical management of health care of persons with complex chronic disorders such as urinary/fecal incontinence, chronic wounds and psychiatric disorders. The course is designed to provide students with the opportunity to integrate knowledge of selected chronic conditions with previously acquired knowledge concerning the management of health care of patients. 3 credit hours.

NGN 685L. Practicum I: Gerontological Nurse Practitioner – This is the first of two gerontological practica courses for the dual adult/Gerontological Nurse Practitioner specialty. In selected clinical settings students are expected to integrate the knowledge and competencies gained from foundation courses and didactic content to further develop the Gerontological Nurse Practitioner role. This course allows the student to develop the role by providing health care services to individuals, families, and groups, while emphasizing the promotion of health and prevention of disease. The student addresses the management of actual and potential health problems including common diseases and human responses to diseases. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity, and social issues. Prerequisite: NUR 614L. Corequisite: NAH 621. 2 credit hours.

NGN 686L. Practicum II: Gerontological Nurse Practitioner - This is the second of two gerontological practica courses for the dual adult/Gerontological Nurse Practitioner specialty. In selected clinical settings students are expected to integrate the knowledge and competencies gained from foundation

courses and didactic content to further develop the Gerontological Nurse Practitioner role. This course allows the student to develop the role by providing health care services to individuals, families, and groups, while emphasizing the promotion of health and prevention of disease. It is anticipated that the student will be increasingly independent and skilled as the clinical experience progresses, allowing the student to contribute more toward the management of health problems. The advanced practice role emphasis in this course encompasses a trajectory of the nurse practitioner experience from novice to beginning expert, and includes role components such as interdisciplinary collaborator, coach, educator, and consultant. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity, and social issues. Prerequisite: NAH 621 and NGN 685L. Corequisite: NAH 622. 2 credit hours.

NGN 692L. Residency: Gerontological Nurse Practitioner - This course is the third of three clinical practicum courses and is designated as the culminating practical experience for Gerontology nurse practitioner students. This course encourages the student to apply knowledge and theories from the core courses as well as previous clinical and clinical support courses. A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NGN 686L. 1 or 4 credit hours.

NHSA 616. Nursing Financial Management - Nurse leaders play an important role in managing the financial responsibilities for providing high quality care. This course explores health care economics and health care policy as it applies to access, costs, and quality, current and future mechanisms for financing health care services, and organization and unit level budgeting principles. Content will include creating, monitoring, and analyzing a budget, interpreting financial information, and capital budgeting. Corequisite: NHSA 617L. 3 credit hours.

NHSA 617L. Nursing Financial Management Practicum - This course provides a practical base for students to apply financial concepts in a health care organization. Students will work with healthcare administrators to create, monitor, and/or analyze budgets, examine revenue cycle for opportunities for improvement, and develop a business case for a new product or service. Students arrange their own clinical site(s) with assistance/approval from clinical faculty. Corequisite: NSHA 616. 3 credit hours.

NHSA 618. Human Resource Management - This course provides a theoretical basis for students to learn and apply human resources and organizational concepts, theories, and behaviors. The course will facilitate the individual growth and development of the nurse leader. Content includes human resource management issues; recruitment and retention; staff development; roles clarification; leadership development and succession planning; teamwork and collaborative practice; conflict management;

performance management; cultural competence and the work environment; personnel policies, standards, and laws; and decision making and governance models. Students will begin developing a professional portfolio. Successful completion of field experience is required. 3 credit hours.

NHSA 620. Nursing and Health Systems Administration I - This course provides a theoretical base for students to develop the role of nursing and health systems administrator at the unit level. Emphasis is placed on the development of the knowledge and skills necessary for implementing the management role. Students will develop specific administrative competencies to include the ability to: understand self and others, communicate effectively, develop subordinates, manage conflict, monitor personal and individual performance, manage projects, delegate effectively, manage time and stress, foster a productive work environment, live with change, and build and maintain a power base. Content builds on the theoretical foundations of leadership, organizational behavior, and capital management applied to the structure of nursing and health organizations, patient care delivery and classification systems, staffing, budgeting, quality standards and improvement, risk management, leadership development, strategic planning, and change management. The following elements are integrated into this course: critical thinking, research, scholarly writing, professional presentation, scientific integrity and ethics, cultural diversity, and social issues. The role emphasis of this course is that of beginning nurse manager. Prerequisite: Admission to the Nursing and Health Systems Administration option. 3 credit hours.

NHSA 621. Nursing and Health Systems Administration II - This course provides a theoretical and experiential base for students to develop and implement the role of nursing and health systems administrator at the division/ department level. Emphasis is placed on the synthesis of knowledge and skills from the disciplines of nursing and business management that is necessary to apply when assuming the middle management role. Students will develop specific administrative competencies to include the ability to manage collective performance, design and organize projects, negotiate agreement and commitment, and create change. Content includes analysis of administrative roles and functions, strategies for coordination of quality care within and across departments and systems, strategies for service as an expert resource, business planning, cost and productivity, redesigning practice to achieve goals, models of practice and service delivery, utilization of consultants, managing product/service lines, and utilization of research for improving nursing processes and patient care outcomes. The following elements are integrated into this course: critical thinking, research, scholarly writing, professional presentation, scientific integrity and ethics, cultural diversity, and social issues. The role emphasis of this course is that of mid-level manager. Prerequisite: NHSA 620. Corequisite: NHSA 685L. 2 – 4 credit hours.

NHSA 622. Nursing and Health Systems Administration III - This course continues to provide a

theoretical and experiential base for students to develop and implement the role of nursing and health systems administrator at the executive level. Through seminar discussion and with an executive level preceptor, emphasis is placed on the application, synthesis, and integration of knowledge and skills necessary for effective and efficient management of human and material resources, while incorporating the ethical, social, legal, financial, and economic aspects of health care delivery, health policy, and regulatory requirements for both staff and the organization. Students will develop specific administrative competencies to include the ability to manage organizational performance, manage across functions, present ideas, think creatively, and develop a vision, mission, strategic plan, and set goals. Content includes health care regulation and policy, practice plans and financing, internal and external environmental influences on nursing and health care systems, information system development and management, quality improvement, and managed care systems. The following elements are integrated into this course: critical thinking, research, scholarly writing, professional presentation, scientific integrity and ethics, cultural diversity, and social issues. The role emphasis of this course is that of chief nurse executive. Prerequisite: NHSA 621 and NHSA 685L. Corequisite: NHSA 686L. 2 credit hours.

NHSA 630. Health Services Marketing Management - The redesign of healthcare organizations has mandated larger spans of control for nurse managers with expertise and leadership skills in organizational, human resource, and financial management. The need for the integration of clinical skills with business know-how has been fueled by a more diverse work force with direct responsibility for non-nursing staff, an increased emphasis on customer service and risk management, and the ability to design and implement care delivery models that extend beyond the walls of the organization into the community and its stakeholders. Health systems across the country (and internationally), including home health agencies, managed care entities, public and private sector hospitals, long-term and ambulatory care facilities, and insurance companies, are searching for advanced level nurses for management and executive level positions. 3 credit hours.

NHSA 631. Advanced Quality and Patient Safety - This course examines current issues in quality improvement and patient safety activities. The course includes a review of past and current efforts, tools, and theories of quality assessment, assurance, utilization management, and measuring and improving outcome. In addition, the course looks at new initiatives to improve quality and safety through regulation, reporting and financial incentives. Prerequisite: NUR 600. Corequisite: NHSA 681L. 3 credit hours.

NHSA 632. Nursing and Health Systems Administration I - This course provides a theoretical base for students to develop the role of nursing and health systems administrator. Emphasis is placed on development of knowledge and skills necessary for implementing the management role. Students will develop specific administrative competencies to include the ability to: understand self and others;

communicate effectively, develop subordinates, manage conflict, monitor personal, individual, and team performance, manage projects, delegate effectively, manage time and stress, foster a productive work environment, live with change, and build and maintain a power base. Content builds on the theoretical foundations of leadership, organizational behavior, financial management, patient care delivery, quality standards and improvement, risk management, leadership development, and change management. The following elements are integrated into this course: critical thinking, research, scholarly writing, professional presentation, scientific integrity and ethics, cultural diversity, and social issues. The role emphasis of this course is for entry and mid-level nurse leaders. Prerequisite: Admission to the Nursing and Health Systems Administration option. Prerequisite: NHSA 616, NHSA 617L, NHSA 618, NHSA 631 and NHSA 681L. Corequisite: NHSA 682L. 2 credit hours.

NHSA 633. Nursing and Health Systems Administration II This course offers a theoretical base for students to develop and implement the role of nursing and health systems administrator at the service line/division or higher level. Emphasis is on the synthesis of knowledge and skills from multiple disciplines including nursing and business necessary when assuming a mid-level to senior level leadership role. A primary focus of this course is to develop the nurse leader as an expert to influence patient care, systems and community outcomes in a variety of settings such as ambulatory clinics, long-term care, acute care, community, managed care and policy-making. Content includes strategic management, health care policy and regulation, internal and external environmental assessments, disaster preparedness, and organizational and professional accountability. The following elements are integrated into this course: critical thinking, research, scholarly writing, professional presentation, scientific integrity and ethics, cultural diversity, and social issues. The role emphasis of this course is mid-level to senior level leadership roles. Prerequisite: NHSA 632 and NHSA 682L. Corequisite: NSHA 683L. 3 credit hours.

NHSA 640. Economics for Nursing - Nurses care for people and caring is the central concept of modern nursing. Yet caring takes many forms, including caring about the economics of services provided. Changes in payment systems, organizational structure and the U.S. healthcare market have led to new interests in the economics of care delivery. Nurses play a major role in this care delivery, as clinicians, administrators and scholars. Topics for the completely on-line course include a basic introduction to economics as it applies to nursing, the nursing labor and service markets and critical professional economic issues facing nursing today. 3 credit hours.

NHSA 681L. Advanced Quality and Patient Safety Practicum - This course provides an experiential base for students to develop and implement the role of nursing and health systems quality and outcomes manager within a healthcare organization. Students will analyze outcomes measurement and quality improvement in a health care setting from a strategic perspective and engage, as leaders and participants, in efforts to improve the quality of health services. Students arrange their own clinical sites

with assistance/approval from clinical faculty. Corequisite: NHSA 631. 3 credit hours.

NHSA 682L. Nursing and Health Systems Administration I Practicum - This course is the third of four required practicum courses for the nursing and health systems administration student. Students in this course will synthesize theoretical concepts for administration practice and apply knowledge and skills obtained in masters core courses and prerequisite support courses to meet the objectives of the course. Students will arrange their own clinical site(s) with assistance/approval from clinical faculty. Prerequisite: NHSA 616, NHSA 617L, NHSA 618, NHSA 631 and NHSA 681L. Corequisite: NHSA 632. 2 credit hours.

NHSA 683L. Nursing and Health Systems Administration II Practicum - This course is the last of four practicum courses for the nursing and health-systems administration student. Students in this course will synthesize theoretical concepts for administration practice and apply knowledge and skills obtained in masters core courses and prerequisite support courses to meet the objectives of the course. Emphasis is placed on the synthesis of knowledge and skills from the disciplines of nursing and business management that is necessary to apply when assuming a mid- or senior level management/leadership role. Students will arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NHSA 632 and NHSA 682L. Corequisite: NHSA 633. 2 credit hours.

NHSA 685L. Nursing and Health Systems Administration Practicum I - This course is the first of two required application courses for the nursing and health-systems administration student. Students in this course will synthesize theoretical concepts for administration practice and apply knowledge and skills obtained in masters core courses and prerequisite support courses to meet the objectives of the course. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NHSA 620. Corequisite: NHSA 621. 1 – 2 credit hours.

NHSA 686L. Nursing and Health Systems Administration Practicum II - Nursing and Health Systems Administration/Quality and Outcomes Management in Health Systems: This course provides an experimental base for students to develop and implement the role of nursing and health systems administrator and quality and outcomes manager at the executive level. Emphasis is placed on the synthesis of knowledge and skills from the disciplines of nursing and business management that is necessary to apply when assuming a management and leadership role. Students will analyze outcomes measurement and quality improvement in a health care setting from a strategic perspective and engage, as leaders and participants, in efforts to improve the quality of health services. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NHSA 621 and NHSA 685L. Corequisite: NHSA 622. 4 credit hours.

NMD 621. Advanced Management of Diabetes I - A variety of management strategies will be presented

from multiple healthcare disciplines. The perspectives of the multi-disciplinary team in assisting persons to achieve self-care goals is an important theme throughout this course as are the current controversies, issues, and research findings underlying present approaches to treatment and patient/family education. Topics presented are based on the curriculum blueprint of the American Diabetes Educators Program recommendations for the ANCC/AADE Advanced Diabetes Management certification examination for clinical nurse specialist and/or nurse practitioners. The topics addressed in this course include: recognition of early signs of diabetes mellitus, self-glucose monitoring, and diabetes among: minorities, and those residing in rural settings. Prerequisite: NUR 600, NUR 614L, NCA 621 and NCA 685L or equivalent or ANCC certification as a nurse practitioner. 3 credit hours.

NMD 622. Advanced Management of Diabetes II - This online course is the second in a program of study focusing on advanced diabetes management across the lifespan. Two didactic and three clinical courses are offered that will provide a multi-disciplinary framework for the identification of those at risk for or who already possess the metabolic syndrome, prediabetes, frank type 1 or 2 diabetes mellitus and/or the associated complications. A variety of management strategies will be presented from multiple healthcare disciplines. The perspectives of the multi-disciplinary team in assisting persons to achieve self-care goals is an important theme throughout this course as are the current controversies, issues, and research findings underlying present approaches to treatment and patient/family education. Topics presented are based on the curriculum blueprint of the American Diabetes Educators Program recommendations for the ANCC/AADE Advanced Diabetes Management certification examination for clinical nurse specialist and/or nurse practitioners. Topics presented will be based on the curriculum of the American Diabetes Educators Program recommendations for the Certified Diabetes Educator. These topics include: family planning, gestational diabetes, poly cystic ovarian syndrome (PCOS), orthopedic sequelae of diabetes, transplantation, glucose monitoring, insulin pump and other advanced diabetes technologies, diabetes in: rural minorities, elderly, children; diabetes in persons with disabilities, insurance issues, cultural issues, economic issues, mood disorders, eating disorders, hypoglycemia, pain management, foot care, risks of ESRD, hypertension, obesity, dental concerns and provider reimbursement issues regarding diabetes education services. Prerequisite: NMD 621 and NMD 685L or ANCC certification as a nurse practitioner. 3 credit hours.

NMD 685L. Practicum I: Advanced Management of Diabetes - NMD 685L allows the student to begin the development of the Advanced Diabetes Management role by providing health care services to clients across the lifespan (i.e., individuals, families, groups) in a variety of settings and emphasizing the promotion of health and the prevention of disease. Further, the student applies knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. It is anticipated that the student will be increasingly

independent and skilled as each clinical experience progresses, allowing him/her to become proficient and to contribute to the management of more complex health problems. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity and awareness of social and professional issues. The advanced practice role emphasis in this course begins the trajectory of the NP experience from novice to beginning expert, and includes role components such as interdisciplinary collaborator, coach, teacher, manager, researcher, and consultant. Students arrange their own clinical sites with assistance/approval from clinical faculty. Corequisite: NMD 621. 3 credit hours.

NMD 692L. Advanced Management of Diabetes Residency - NMD 692L prepares the student in the Advanced Management Diabetes (AMD) role to be a beginning expert in the diagnosis and management of patients' health problems. In the residency, the student is expected to continue growth toward becoming an independent practitioner, specializing in the care of populations across the lifespan with health problems requiring primary, acute, and/or critical care management. The student further develops the AMD role with patients/clients by providing health care services to clients (i.e. individuals, families, groups) emphasizing the promotion of health and the prevention of disease. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity, and social issues. The advanced practice role emphasis in this course continues the trajectory of the nurse practitioner experience from novice to beginning expert, and includes role components such as interdisciplinary collaborator, coach, educator, and consultant. A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NMD 622 and NMD 686L. 4 credit hours.

NNE 613. Neonatal Pharmacology and Therapeutics - This course focuses on the analysis and utilization of principles of pharmacology and pharmacokinetics for the purpose of planning, implementing, and evaluating therapeutic pharmacological interventions within the specified population. The unique characteristics of the neonatal population, related to therapeutic needs, as well as drug absorption, metabolism and excretion are defined. 3 credit hours.

NNE 614L. Assessment and Diagnostic Reasoning Advanced Nursing Practice - This course is designed to provide students with an advanced level of skill and knowledge in critical thinking, procedures and skills, and diagnostic reasoning for conducting health assessments and planning care for holistic, adaptive human beings. The following elements are integrated into the course: professional

presentations, critical thinking, scientific integrity and ethics, human diversity and social issues. Pre or Corequisite: NUR 612. 4 credit hours.

NNE 621. Advanced Neonatal Nursing I - This course provides a theoretical and practical base for students to diagnose and manage health problems of neonates. Content includes management strategies from the domains of nursing, medical, and pharmacological therapeutics, and emphasizes direct care to clients. This course utilizes a lecture/ discussion and case study format to assist the student in the clinical assessment and decision-making to provide direct patient care to neonatal patients within the scope of practice of neonatal nurse practitioners. The student is expected to apply the concepts and theories discussed in class to the care of neonatal patients during the clinical course taken in conjunction with this course. The following elements are integrated into this course: critical thinking, health promotion and disease prevention, research, ethics, cultural diversity, and social issues. Prerequisite: NUR 612, NUR 614L or NNE 614 and NNE 613. Corequisite: NNE 684L. 4 credit hours.

NNE 622. Advanced Neonatal Nursing II - This course is designed to provide the student with opportunities to integrate in-depth knowledge of health assessment and management skills to provide care for clients with commonly occurring chronic and complex health problems. Students will also have the opportunity to develop strategies to market the nurse practitioner role, to create a specific practice position, and to explore strategies to market their role as a neonatal nurse practitioner. The following elements are integrated into the course: critical thinking, health promotion and disease prevention, scientific integrity and ethics, human diversity and social issues, and professional role development. Prerequisite: NNE 621 and NNE 684L. Corequisite: NNE 685L. 4 credit hours.

NNE 623. Advanced Neonatal Nursing III - This course provides a theoretical and practical base for students to diagnose and manage health problems common to the neonatal client and the child under two years of age that primarily or secondarily affect multiple organ systems. The student will gain practice prioritizing these problems when planning care. Procedures, techniques and equipment used in the diagnoses and care of patients with these problems will be covered. Prerequisite: NNE 622 and NNE 685L. Corequisite: NNE 686L. 3 – 4 credit hours.

NNE 684L. Practicum I: Neonatal Nurse Practitioner - NNE 684L is the first of three practicum courses that will be followed by a residency. In selected clinical settings, students are expected to integrate the knowledge and competencies gained from foundation courses to begin to develop the Neonatal Nurse Practitioner role in a primary care setting. Students and faculty cooperatively arrange clinical sites. Prerequisite: NUR 612, NUR 614L or NNE 614L and NNE 613. Corequisite: NNE 621. 2 credit hour.

NNE 685L. Practicum II: Neonatal Nurse Practitioner - This course prepares the student in the

Neonatal Nurse Practitioner role. The student develops the Neonatal NP role with patients/clients by providing neonatal health care services to clients (i.e. individuals, families, groups), emphasizing the promotion of health and the prevention of disease throughout the course of clinical experiences over two or three academic terms. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. It is anticipated that the student will be increasingly independent and skilled as each clinical experience progresses, allowing him/her to become more proficient and to contribute to the management of more complex health problems. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity, and social issues. The advanced practice role emphasis in this course encompasses a trajectory of the nurse practitioner experience from novice to beginning expert, and includes interdisciplinary collaboration, coach, educator, and may include consultant. Students and faculty cooperatively arrange clinical sites. Prerequisite: NNE 621 and NNE 684L. Corequisite: NNE 622. 1 – 4 credit hours.

NNE 686L. Practicum III: Neonatal Nurse Practitioner - This course is the second of two practicum courses that will be followed by a residency. In selected clinical settings, students are expected to integrate the knowledge and competencies gained from foundation courses to begin to further develop the NNP Role. Students and faculty cooperatively arrange clinical sites. Prerequisite: NNE 622 and NNE 685L. Corequisite: NNE 623.. 1 – 3 credit hours.

NNE 692L. Residency: Neonatal Nurse Practitioner – This course prepares the student in the Neonatal Nurse Practitioner role to be a beginning expert in the diagnosis and management of neonatal patient problems. In the residency, the student is expected to continue growth toward becoming an independent practitioner, specializing in the care of neonates. The student further develops the neonatal nurse practitioner role with patients/clients by providing neonatal health care services to clients (i.e. individuals, families, groups), emphasizing the promotion of health and prevention of disease. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity, and social issues. The advanced practice role emphasis in this course continues the trajectory of the nurse practitioner experience from novice to beginning expert, and includes role components such as interdisciplinary collaborator, coach, educator, and consultant. A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation. Students and faculty cooperatively arrange clinical sites. Prerequisite:

NNE 623 and NNE 686L. 1 – 6 credit hours.

NNI 621. Conceptual Basis for Informatics Practice - This course is based on the concepts underpinning nursing informatics practice as delineated in the American Nurses Association s Scope and Standards of Nursing Informatics Practice. Students will explore theories of adult education, communication, systems, decision making, human-computer interaction and the concepts of data, information and knowledge. They will have the opportunity to learn how these theories and concepts are utilized in informatics practice. Prerequisite: NUR 643. 3 credit hours.

NNI 622. The Information System Life Cycle - This offering is designed to be the culminating course of the nursing informatics specialist curriculum. This course ties together all previous course work together in an application based review of the information system life cycle from systems analysis to system evaluation and maintenance. The course is designed to be taken in conjunction with a clinical experience in which the student will be exposed to aspects of the hands on application of course content. 3 credit hours.

NNI 685L. Nursing Informatics: Practicum I - This course provides an experimental base for students to develop and implement the role of the informatics nurse specialist. Emphasis is placed on the synthesis and application of the theories and concepts that provide the basis of informatics practice. Students will develop the ability to collaborate in multidisciplinary groups, identifying areas for the design and implementation of administrative and clinical technological applications. Students will spend 100 hours during the semester working with a clinical informatics specialist in practice. Students and faculty cooperatively arrange clinical sites. Prerequisite: NNI 621. 3 credit hours.

NNI 686L. Nursing Informatics: Practicum II - This course provides an experimental base for students to develop and implement the role of the informatics nursing specialist at the organizational level. Students will be paired with a nursing informatics specialist working on aspects of system analysis, design, implementation and evaluation. This experience requires the student synthesize knowledge gained in all previous courses in the curriculum. This course includes 100 hours of clinical practice and is designed to function as the clinical capstone to the NNI curriculum. A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation. Students and faculty cooperatively arrange clinical sites. Prerequisite: NNI 685L. 2 credit hours.

NNS 630. Advanced Neuroscience Nursing - This course emphasis is placed on integration of knowledge from the neuroscience and knowledge from general pathophysiology with insights gained through clinical experience. NNS 630 add to student's theoretical base for managing disorders related to

episodic and chronic dysfunction of the neurosystem. Emphasis is placed on knowledge of neuroscience underlying the role of the nurse practitioner clinical nurse specialist. This course is also designed to provide students with opportunities to integrate knowledge of ethical issues and future trends into advanced neuroscience nursing practice. 3 credit hours.

NOM 611. Creativity, Resources and Problem Solving Tools for Health Care Quality - This course provides an introduction to concepts, theories/schools of thought, and resources in the areas of outcomes measurement and quality management; addresses systems thinking, creativity, and quality/problem solving tools. Admission to the MSN Program or permission for course instructor. 2 credit hours.

NON 630. Advanced Adult Oncology Nursing – This course provides a theoretical base for students to diagnose and manage acute oncology health problems of adults. Emphasis is placed on integration of knowledge of pathophysiology, clinical assessment, and nursing and medical management. 3 credit hours. Taught only if sufficient students indicate interest.

NPA 626. Palliative Care for Advanced Nursing Practice I - This course provides a theoretical and practical foundation for students to diagnose and manage the health needs of the palliative care patient and family in the delivery of culturally competent care across the life span. Content includes multidisciplinary management strategies to holistic healthcare delivery as it applies to administration of culturally competent palliative care. This course will utilize discussion, online activities for application of class content, readings, lecture and guest lecture approach to supplement text readings and online delivery of didactic content. The students are expected to apply culturally competent and palliative care theories to clinical assessment and decision-making strategies in order to provide direct patient care to the palliative care patient and family. Prerequisite: NUR 614L. Corequisite: NPA 685L. 3 credit hours.

NPA 627. Palliative Care for Advanced Nursing Practice II - This course is designed to provide the student with opportunities to integrate in-depth knowledge of health assessment and management skills to provide care for patients with commonly occurring palliative care problems. Students will also have the opportunity to develop strategies to market the advanced practice nurse role, to create a specific practice position and to explore strategies to market their role in health care. The following elements are integrated into the course: critical thinking, health promotion, disease prevention and palliative care, scientific integrity and ethics, human diversity and social issues and professional role development. Corequisite: NPA 686L. 3 credit hours.

NPA 685L. Practicum: Culturally Competent Palliative Care Nurse Practitioner I – This course allows the student to develop the Culturally Competent Palliative Care Nurse Practitioner role by providing health and palliative care services to clients across the lifespan, families and groups while

emphasizing the promotion of health, the prevention of disease and the palliative care for life altering conditions throughout the course of clinical experiences over two academic terms. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NUR 614L. Corequisite: NPA 626. 3 credit hours.

NPA 686L. Practicum: Culturally Competent Palliative Care Nurse Practitioner II – This course allows the student to develop the Culturally Competent Palliative Care Nurse Practitioner role by providing health and palliative care services to clients across the lifespan, families and groups while emphasizing the promotion of health, the prevention of disease and palliative care for life altering conditions throughout the course of clinical experiences over two academic terms. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. An Objective Structured Patient Experience held during this course will determine if the student can progress into 6 hours of the final residency course, NCA 692L. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NPA 621 and NPA 685L. Corequisite: NPA 622. 3 credit hours.

NPA 692L. Residency: Culturally Competent Palliative Care Nurse Practitioner - This course prepares the student in the Culturally Competent Palliative Nurse Practitioner role to be a beginning expert in the diagnosis and management of client's health problems. During residency, the student is expected to continue growth toward becoming an independent practitioner, specializing in the culturally competent care of clients from across the lifespan. The student further develops the Palliative Care Nurse Practitioner role with patient/clients by providing health care services to clients (i.e. individuals, families, groups) emphasizing the promotion of health, prevention of disease and/or palliation of symptoms of life-altering diseases. A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NPA 622 and NPA 686L. 3 – 6 credit hours.

NPE 613. Primary Care Pediatric Pharmacology - This course is a supplement course for Primary Care Practitioner students to provide them with information necessary to safely and competently prescribe medications for infants, children and adolescents. It complements the information provided in NUR 613 Pharmacology and Therapeutics but focuses on the unique physiologic and metabolic characteristics of this population. Pre or corequisite: NUR 613. 1 credit hour.

NPE 621. Advanced Pediatric Nursing I - This course provides a theoretical and practical base for students to diagnose and manage health problems of children. Content includes management strategies from the domains of nursing, medicine, and pharmacological therapeutics, and emphasizes direct care to clients. This course utilizes a lecture/discussion and case study format to assist the student in the clinical assessment and decision-making to provide direct patient care to pediatric patients within the scope of practice of pediatric nurse practitioners. The student is expected to apply the concepts and theories discussed in class to the care of pediatric patients during the clinical course taken in conjunction with this course. The following elements are integrated into this course: critical thinking, health promotion and disease prevention, research, ethics, cultural diversity, and social issues. Prerequisite: NUR 612, NUR 613 and NUR 614L. Corequisite: NPE 685L. 4 credit hours.

NPE 622. Advanced Pediatric Nursing II - This course is designed to provide the student with opportunities to integrate in-depth knowledge of health assessment and management skills to provide care for clients with commonly occurring chronic and complex health problems. Students will also have the opportunity to develop strategies to market the nurse practitioner role, to create a specific practice position, and to explore strategies to market their role as a pediatric nurse practitioner. The following elements are integrated into the course: critical thinking, health promotion and disease prevention, scientific integrity and ethics, human diversity and social issues, and professional role development. Prerequisite: NPE 621 and NPE 685L. Corequisite: NPE 686L. 2 credit hours.

NPE 623. Advanced Pediatric Nursing III – This course expands the student's theoretical and practical base in diagnosing and managing health problems of children and adolescents. Content includes management strategies from the domains of nursing, medicine, and pharmacological therapeutics, and emphasizes direct care to clients. This course utilizes study modules, guided readings and a case study format to assist the student in the clinical assessment and decision-making to provide direct patient care to pediatric patients within the scope of practice of pediatric nurse practitioners. The student is expected to apply the concepts and theories discussed in class to the care of pediatric patients during the clinical course taken in conjunction with this course. The following elements are integrated into this course: critical thinking, health promotion and disease prevention, research, ethics, cultural diversity, and social issues. Prerequisite: NPE 622 and NPE 686L. Corequisite: NPE 687L. 4 credit hours.

NPE 685L. - Practicum I: Pediatric Nurse Practitioner - This course prepares the student in the Pediatric Nurse Practitioner role. The Student develops the Pediatric Nurse Practitioner role with patients/clients by providing pediatric health care services to clients (i.e. individuals, families, groups) emphasizing the promotion of health and the prevention of disease throughout the course of clinical experiences over two or three academic terms. Further, the student continues to apply knowledge and

current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. An on-campus intensive will include case scenarios in the simulation lab with the SimBaby. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NUR 614L. Corequisite: NPE 621. 1 - 3 credit hours.

NPE 686L. Practicum II: Pediatric Nurse Practitioner - This course prepares the student in the Pediatric Nurse Practitioner role. The student develops the Pediatric Nurse Practitioner role with patients/clients by providing pediatric health care services to clients (i.e. individuals, families, groups) emphasizing the promotion of health and the prevention of disease throughout the course of clinical experiences over two or three academic terms. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. It is anticipated that the student will be increasingly independent and skilled as each clinical experience progresses, allowing him/her to become more proficient and to contribute to the management of more complex health problems. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity and social issues. The advanced practice role emphasis in this course encompasses a trajectory of the nurse practitioner experience from novice to beginning expert, including interdisciplinary collaboration, coach, educator, consultant roles. An on-campus intensive will include case scenarios in the simulation lab with the SimBaby. Performance during this intensive will determine if the student can progress into 6 hours of the final residency course. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NPE 621 and NPE 685L. Corequisite: NPE 622. 1 – 3 credit hours.

NPE 687L. Practicum III: Pediatric Nurse Practitioner – This course prepares the student in the Pediatric Nurse Practitioner role. The student develops the Pediatric NP role with patients/clients by providing pediatric health care services to clients (i.e. individuals, families, groups) emphasizing the promotion of health and the prevention of disease throughout the course of clinical experiences over two or three academic terms. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. It is anticipated that the student will be increasingly independent and skilled as each clinical experience progresses, allowing him/her to become more proficient and to contribute to the management of more complex health problems. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity and social issues. The advanced practice role emphasis in this course encompasses a trajectory of the nurse practitioner experience from novice to beginning expert, including interdisciplinary collaboration, coach, educator, consultant roles. Prerequisite: NPE 622 and NPE 686L.

Corequisite: NPE 623. 2 credit hours.

NPE 692L. Residency: Pediatric Nurse Practitioner - This course prepares the student in the Pediatric Nurse Practitioner role to be a beginning expert in the diagnosis and management of pediatric patient problems. In the residency, the student is expected to continue growth toward becoming an independent practitioner, specializing in the care of children. The student further develops the pediatric nurse practitioner role with patients/clients by providing pediatric health care services to clients (i.e. individuals, families, groups), emphasizing the promotion of health and the prevention of disease. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity, and social issues. The advanced practice role emphasis in this course continues the trajectory of the nurse practitioner experience from novice to beginning expert, and includes role components such as interdisciplinary collaborator, coach, educator, and consultant. An on-campus intensive will include case scenarios in the simulation lab with the SimBaby. A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NPE 623 and NPE 687L. 1 – 6 credit hours.

NPN 613. Psychopharmacology for Advanced Practice Nursing - This course will provide advanced knowledge of psychobiological information in conjunction with the use of psychopharmacological interventions with patients. This course will focus on the pharmacokinetics and clinical management including prescription of medications for psychiatric disorders. Prerequisite: NUR 613, NPN 621 and NPN 685L. 3 credit hours

NPN 621. Advanced Psychiatric Nursing I - This course provides a theoretical base for students to diagnose and manage psychiatric mental health problems of children, adolescents, and young adults. Content includes management strategies from the domains of nursing, medicine, and pharmacological therapeutics. The course uses a lecture/discussion and case study format to assist students in the clinical assessment and decision-making to provide direct patient care to patients within the scope of practice of family psychiatric nurse practitioners. Critical thinking, health promotion, disease prevention, research, coding, Healthy People 2010, and cultural diversity are integrated into the course. Prerequisite: NUR 601 , NUR 613 and NUR 614L. Corequisite: NPN 685L. 5 credit hours.

NPN 622. Advanced Psychiatric Nursing II - This course provides a theoretical base for psychiatric nurse practitioner students to diagnose and manage psychiatric mental health problems of patients across the lifespan. Content includes management strategies from the domains of nursing, medicine, and

pharmacological therapeutics. The course uses a lecture/discussion and problem based behavioral science case studies to assist students in the clinical assessment and decision-making to provide direct patient care to patients within the scope of practice of family psychiatric nurse practitioners. Critical thinking, health promotion, disease prevention, research, coding, Healthy People 2010, and cultural diversity are integrated into the course. Prerequisite: NPN 621 and NPN 685L. Corequisite: NPN 686L and NPN 613. 3 credit hours.

NPN 685L. Practicum I: Family Psychiatric Nurse Practitioner - NPN 685L allows the student to develop the family psychiatric nurse practitioner role by providing health care services to patients and emphasizing the health promotion and the disease prevention. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common psychiatric disorders. It is anticipated that the student will become increasingly independent and skilled as the clinical experience progresses. The following elements are integrated into the course: critical thinking, coding, professional presentations, research utilization, scientific integrity and ethics, human diversity and social issues. The advanced practice role emphasis in this course encompasses a trajectory of the family psychiatric nurse practitioner from novice to beginning expert, and includes role components such as interdisciplinary collaborator, coach, educator, and consultant. Students arrange their own clinical sites with assistance/approval from clinical faculty. . Prerequisite: NUR 601 , NUR 613 and NUR 614L. Corequisite: NPN 621. 3 credit hours.

NPN 686L. Practicum II: Family Psychiatric Nurse Practitioner - NPN 686L allows the student to develop the family psychiatric nurse practitioner role by providing health care services to patients and emphasizing health promotion and the disease prevention. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common psychiatric disorders. It is anticipated that the student will become increasingly independent and skilled as the clinical experience progresses. The following elements are integrated into the course: critical thinking, coding, professional presentations, research utilization, scientific integrity and ethics, human diversity and social issues. The advanced practice role emphasis in this course encompasses a trajectory of the family psychiatric nurse practitioner from novice to beginning expert, and includes role components such as interdisciplinary collaborator, coach, educator, and consultant. An Objective Structured Patient Experience held during this course will determine if the student can progress into 6 hours of the final residency course. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NPN 621 and NPN 685L. Corequisite: NPN 622. 3 credit hours.

NPN 692L. Residency: Family Psychiatric Nurse Practitioner - NPN 692L is the culminating

experience for the student to practice in the role of a family psychiatric nurse practitioner. This course emphasizes the application of previously learned theories and knowledge from nursing and other disciplines to the continued development of clinical decision making skills. The student will implement the role of the family psychiatric nurse practitioner to manage the health care of clients (i.e., individuals, families, groups) in primary or acute care settings. A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NPN 622 and NPN 686L. 6 credit hours.

NPP 685. Interdisciplinary Pediatric Pulmonary Care I – This course provides the trainee with the opportunity to analyze ideas, concepts and theories relative to the delivery of healthcare to pediatric pulmonary patients. Emphasis will be focused on the acquisition of in-depth knowledge of all aspects of the well child. Chronic respiratory disease is presented as the model to demonstrate the effects of chronic illness of the child and family. Trainees are introduced to basic respiratory anatomy and physiology, diagnostic procedures and various treatment modalities. Throughout the term, trainees will be expected to apply the knowledge and skills acquired to selected clinical assignments. 3 credit hours.

NPP 686. Interdisciplinary Pediatric Pulmonary Care II - NPP 686 provides the traninee with the opportunity to analyze ideas, concepts and theories relative to the delivery of healthcare to pediatric pulmonary patients. Emphasis will be focused on the acquisition for in-depth knowledge of all aspects of the well child. Chronic respiratory disease is presented as the model to demonstrate the effects of chronic illness on the child and family. Trainees are introduced to basic respiratory anatomy and physiology, diagnostic procedures and various treatment modalities. Throughout the term, trainees will be expected to apply the knowledge and skills acquired to selected clinical assignments. 3 credit hours.

NTC 650. Instructional Strategies For Teaching in Nursing - This course is required for students in the Teacher in Nursing Certificate program and maybe chosen as an elective course by other graduate students. The content is general and applicable to a variety of teaching situations and learners. The course is an introduction to a systematic approach to developing and implementing adult learning experiences. This course emphasizes the application of a systematic approach (assessing, planning, implementing, and evaluating) to the design of an educational unit. The focus will be on assessing learning needs, identifying learning objectives, selection of resources, and development of teaching strategies for different learner populations. 3 credit hours.

NTC 652. Program and Curriculum Development - This course is a required for students in the Teaching Nursing Certificate program and may be chosen as an elective course by other graduate students. The content is general and applicable to course, educational program, and/or curriculum

development. The course is an introduction to the educational development process. This course emphasizes the basic components of program/curriculum development, philosophy, goals, planning learning experiences, implementing learning experiences, and evaluation of the curriculum or an educational program. The focus is on an understanding of program/curriculum determinants (learning, knowledge, man, society) and their impact on curriculum and educational program planning. The impact of philosophy, organizing framework, goals, learning experiences, and evaluation on curricular and program design and development will be discussed. 3 credit hours.

NTC 654. Evaluation of Instruction in Nursing - This course is a required for students in the Teacher in Nursing Certificate program and may be chosen as an elective course by other graduate students. The content is general and applicable to a variety of health related educational settings and learners. This course is an introduction to educational testing and measurement, teaching effectiveness, and clinical performance appraisal. This course provides an overview of evaluation techniques that enable nurses to plan and implement a variety of education related evaluation approaches, including test construction, item analysis, teaching effectiveness, and clinical performance appraisals. Emphasis will be placed on classroom and clinical evaluation of learning and on the use of technology for evaluation purposes. Prerequisite: Admission to Graduate Studies in the School of Nursing or as a non-degree post-baccalaureate student or by permission of instructor; knowledge of statistics and writing measurable educational objectives in the domains of knowledge, skills, and attitudes. 3 credit hours.

NTC 656. WebCT for Instructors and Designers - Provides students with an advanced level of skill and knowledge of WebCT. Students are introduced to WebCT tools in a sequence that will permit development of a new course using WebCT as a learning management system. 3 credit hours. This course is offered only when sufficient interest by students is generated.

NTC 683L. Teaching Practicum in Nursing - This course is a required practicum for students in the Teacher in Nursing Certificate program and may be taken as an elective course by other graduate students who are concurrently enrolled in one or more NTC courses. The practicum provides an opportunity for students to concurrently or retrospectively implement the knowledge and skills acquired in NTC 650, NTC 652, and NTC 654 to selected teaching (classroom and clinical) situations. This course provides opportunities for students to integrate previously or concurrently acquired knowledge concerning teaching, curriculum, and/or evaluation into selected classroom and clinical situations. This practicum course allows students to assume limited responsibilities in classroom and clinical teaching while under the guidance of an instructor and/or preceptor. Students will be expected to meet all the course objectives upon completion of the three credit hour practicum. The practicum should involve both didactic and clinical teaching. Students arrange their own clinical sites with assistance/approval from clinical faculty.

Prerequisite: Admission to Graduate Studies in the School of Nursing or as a non-degree post-baccalaureate student. Prerequisite: NTC 650, NTC 652, and NTC 654. 1- 3 credit hours.

NTC 692L. Residency: Nurse Educator - This course prepares the student in the educator role to be a beginning practitioner in nursing education. Under the supervision of qualified preceptors in the residency, students will have the opportunity to practice behaviors that will assist them to attain beginning expertise in nursing education. Students will apply knowledge learned in their area of specialization, content from support courses in teaching and evaluation and research related to the best practices in nursing education. A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NTC 650, NTC 652 and NTC 654. 3 – 6 credit hours.

AMNP

Course Descriptions

NUR 501. Foundations of Professional Nursing - NUR 501 focuses on the practice of professional nursing as an evidence-based, goal-directed activity for assisting patients to achieve optimal health by meeting basic human needs, providing holistic care, and engaging in health promotion. Concepts of communication, interpersonal relationships, and nursing process as clinical decision-making strategies are introduced. Chronic and long-term internal and external environmental variables that affect the health of adults are explored. The professional roles of caregiver and advocate are developed in diverse learning experiences. Admission to the School of Nursing is required. Corequisite: NUR 502L, NUR 504L, NUR 512, NUR 513 and NUR 514L. 3 credit hours.

NUR 502L. Foundations of Clinical Practice - In this practicum component of Foundations of Professional Nursing, students are guided in the application of content studied in the theoretical portion of the course. Competencies needed by the nurse generalist in the care of adult patients are introduced and practiced. Critical thinking and clinical decision-making skills utilized by the nurse caregiver are emphasized in diverse health care settings. Corequisite: NUR 501, NUR 504L, NUR 512, NUR 513 and NUR 514L 3 credit hours.

NUR 503. Nursing Care of Older Adults - NUR 503 focuses on the unique needs of older adult patients who require nursing care in a variety of healthcare settings. The older adult as a heterogeneous, holistic person is emphasized in light of current and future health care needs. Concepts of healthy aging and care in the preventive, restorative, acute, and chronic domains are explored. The professional role of the nurse as advocate is developed in diverse learning activities. Prerequisite: NUR 505, NUR 506L, ,NUR

515 and NUR 516L. Corequisite: NUR 507, NUR 508L, NUR 509, NUR 510L, NUR 517 and NUR 518L. 3 credit hours.

NUR 504L. Concepts and Skills for Professional Nursing - NUR 504L provides basic nursing skills that will form the foundation for more complex knowledge and skills in subsequent nursing courses. Current nursing trends, legal, ethical (e.g., confidentiality, documentation), quality, safety, and health concepts are reinforced throughout the course. The role of caregiver is presented as an integral part of the health care team. Learning experiences occur in the nursing skills laboratory. Although knowledge and skills in this course are focused on the adult population, many of the concepts are transferable to care of patients across the lifespan. Admission to the School of Nursing is required. Corequisite: NUR 501, NUR 502L, NUR 512, NUR 513 and NUR 514L. 2 credit hours.

NUR 505. Nursing Care of Adults - NUR 505 focuses on patients across the adult lifespan who require nursing care in chronic and acute health care settings. Internal and external environmental variables that have implications for interventions that promote risk reduction and health are examined. Emphasis is placed on evidence-based clinical decision-making in promoting health, meeting physiological needs, and providing holistic care during illness and at end of life. The professional roles of the nurse are further developed in increasingly complex learning experiences. Prerequisite: NUR 501, NUR 502L, NUR 504L, NUR 512, NUR 513 and NUR 514L. Corequisite: NUR 506L, NUR 515 and NUR 516L. 4 credit hours.

NUR 506L. Clinical Practice With Adult Patients - In this practicum, students apply content learned in the companion theory course, NUR 505 Nursing Care of Adults. Competencies needed by the nurse generalist in the care of adult patients are developed in increasingly complex learning experiences. Critical thinking, clinical decision-making, and leadership skills utilized by the nurse caregiver in a variety of health care settings are emphasized. Prerequisite: NUR 501, NUR 502L, NUR 504L, NUR 512, NUR 513 and NUR 514L. Corequisite: NUR 505, NUR 515 and NUR 516L. 4 credit hours.

NUR 507. Promoting Healthy Childbearing and Childrearing Families - NUR 507 focuses on the practice of professional nursing as an evidence-based, goal-directed activity for assisting childbearing and childrearing families to achieve optimal health by meeting basic human needs, providing holistic care, and engaging in health promotion. Concepts of communication, interpersonal relationships, and nursing process as a clinical decision-making strategy are reinforced. Chronic and acute internal and external environmental variables that affect the health of women during pregnancy, neonates, children, and adolescents are explored. The professional roles of caregiver and educator are developed in diverse learning experiences. Prerequisite: NUR 505, NUR 506L, NUR 515 and NUR 516L. Corequisite: NUR 503, NUR 508L, NUR 509, NUR 510L, NUR 517 and NUR 518L. 3 credit hours.

NUR 508L. Clinical Practice with Childbearing and Childrearing Families - : In this practicum, students apply content learned in the companion theory course, NUR 507 Promoting Healthy Childbearing and Childrearing Families. Competencies needed by the nurse generalist in the care of childbearing and childrearing families are developed in increasingly complex learning experiences. Critical thinking, clinical decision-making, and leadership skills utilized by the nurse caregiver in primary and secondary healthcare settings are emphasized. Prerequisite: NUR 505, NUR 506L, NUR 515 and NUR 516L. Corequisite: NUR 503, NUR 507, NUR 508L, NUR 509, NUR 510L, NUR 517 and NUR 518L. 3 credit hours.

NUR 509. Nursing in Communities - In this theory course, students will analyze theories, processes, issues, demographic data, and epidemiological trends that affect population aggregates within communities. Emphasis is on increasing knowledge of professional roles to promote nursing care focused on illness and injury prevention, health promotion, health maintenance, health education and coordination of care for aggregate groups in diverse community settings. Prerequisite: NUR 505, NUR 506L,NUR 515 and NUR 516L. Corequisite: NUR 503, NUR 507, NUR 508L, NUR 510L, NUR 517 and NUR 518L. 2 credit hours.

NUR 510L. Clinical Practice in Communities - In this practicum course, students will apply community and public health concepts in the care of individuals, families, groups, and communities in diverse clinical settings. Emphasis is on increasing knowledge of professional roles to promote nursing care focused on illness and injury prevention, health promotion, health maintenance, health education and coordination of care for aggregation groups in diverse community settings. Prerequisite: NUR 505, NUR 506L,NUR 515 and NUR 516L . Corequisite: NUR 503, NUR 507, NUR 508L, NUR 509, NUR 517 and NUR 518L. 2 credit hours.

NUR 512. Pathophysiology for the Advanced Generalist - NUR 512 is designed to provide the student with an opportunity to build upon existing knowledge of basic physiology. Emphasis is placed on the use of critical thinking to apply physiologic principles in explaining adaptations to pathogenic changes in the systems discussed. Admission to the School of Nursing is required. Corequisite: NUR 501, NUR 502L, NUR 504L, NUR 513 and NUR 514L. 3 credit hours.

NUR 513. Pharmacology and Therapeutics for the Advanced Generalist - Thiscourse focuses on the analysis and utilization of principles of pharmacology, pharmacodynamics and pharmacokinetics for the purpose of planning, implementing and evaluating therapeutic pharmacological interventions. The unique characteristics of special populations related to therapeutic needs, as well as drug absorption, metabolism and excretion are defined. Corequisite: NUR 501, NUR 502L, NUR 504L, NUR 512 and

NUR 514L .. 3 credit hours

NUR 514L. Health Assessment for the Advanced Generalist - This course is designed to provide the advanced generalist nursing student with the skills and knowledge to support critical thinking and diagnostic reasoning while conducting health assessments and planning nursing care for holistic, adaptive human beings across the lifespan. The following elements are integrated into the course: critical thinking, scientific integrity and ethics, human diversity, and social issues. Admission to the School of Nursing is required. Corequisite: NUR 501, NUR 502L, NUR 504L, NUR 512 and NUR 513. 4 credit hours.

NUR 515. Psychiatric-Mental Health Nursing - Content in NUR 515 will emphasize communication and therapeutic nursing interventions for patients experiencing mental disorders. The course focuses on the use of critical thinking and clinical decision-making skills in the promotion, maintenance and restoration of optimum mental health of individuals and families. Emphasis is placed on the independent and collaborative roles of nursing in identifying risk factors for mental disorders, assessing mental health status, and designing and implementing psychobiological and psychosocial interventions associated with expected therapeutic outcomes. Prerequisite: NUR 501, NUR 502L, NUR 504L, NUR 512, NUR 513, NUR 514L. Corequisite: NUR 505, NUR 506L,and NUR 516L. 2 credit hours.

NUR 516L. Clinical Practice in Psychiatric-Mental Health Nursing - This clinical course focuses on promotion, maintenance, and restoration of mental health of individuals and families. Clinical experiences provide students with opportunities to utilize skills in the therapeutic use of self, critical thinking, and nursing process with patients in psychiatric mental health clinical settings. Prerequisite: NUR 501, NUR 502L, NUR 504L, NUR 512, NUR 513, NUR 514L. Corequisite: NUR 505, NUR 506L,and NUR 515. 2 credit hours.

NUR 517. Leadership in Professional Nursing - This course focuses on leadership and management theories and models, resource allocation and management, delegation, conflict resolution, legal implications of practice, managed care, evaluation of practice, continuous quality improvement, healthcare systems, and contemporary issues in the workplace. Students assimilate the above information to use as a basis for practicing the leadership role in the companion residency course. Prerequisite: NUR 505, NUR 506L,NUR 515 and NUR 516L. Corequisite: NUR 503, NUR 507, NUR 508L, NUR 509, NUR 510L, NUR 518L. 2 credit hours.

NUR 518L. Synthesis Practicum in Nursing - This course focuses on direct and indirect clinical performance in the areas of nursing process and leadership, evidence-based practice, and the demonstration of professional nursing role behavior as the transition is made from student role to

practicing nurse professional. Prerequisite: NUR 505, NUR 506L,,NUR 515 and NUR 516L. Corequisite: NUR 503, NUR 507, NUR 508L, NUR 509, NUR 510L, NUR 517. 5 credit hours.

NUR 533. Spirituality in Health Care - This course will focus on spirituality, including a greater understanding of different spiritual traditions, personal spiritual development, and the incorporation of spirituality into professional practice. The content will examine spirituality and health from the perspective of the major world religions and spiritual practices. The impact of spirituality on illness and healing will be examined. Spiritual care, including assessment and selected interventions, legal and ethical issues will be discussed with respect to individuals and families of varying developmental stages, socio-cultural backgrounds, and life situations. Students will be challenged to explore their own spirituality and its impact on their personal and professional lives. A foundation in computer utilization and accessing resources through use of the internet is strongly recommended. 3 credit hours.

NUR 534. Living With Loss - This course includes loss, grief, body-image changes, loss due to chronic conditions, and loss of life in childhood and adulthood explored from the viewpoint of a health-care professional. 3 credit hours.

NUR 574. Transition to Professional Nursing Practice for RNs - Using an online format, this course is designed to enhance the registered nurse's knowledge of the role of the professional nurse in meeting the healthier needs of society. Historical, legal, political, and ethical issues affecting the profession will be examined. The relationship between selected issues, trends, and theories and professional nursing practice will be analyzed. Students will examine behaviors related to various roles of the professional nurse, including caregiver, teacher, advocate, research consumer, and counselor. Additionally, this course addresses communication skills necessary to a professional nurse including writing and computer literacy. For students enrolled in NUR 574, this course is a transition course into the RN-MSN option for post-baccalaureate degree RN Mobility students. 4 credit hours.

NUR 597. Community and Public Health Nursing for RNs - This course is designed for RN students to build on existing clinical expertise and knowledge, broaden exposure to different roles of the professional nurse in the areas of community and public health, and apply knowledge learned throughout the BSN curriculum to meet the needs of population aggregates. Emphasis is on tprofessional nurse role development focused on illness and injury prevention, health promotion, health education, public health preparedness and advocacy for population aggregates across the life span. For students enrolled in NUR 597, this course is a transition course into the RN-MSN option for post-baccalaureate degree RN Mobility students. 4 credit hours.

NUR 600. Research and Statistics for Advanced Practice - This course is designed to prepare

master's students with the research knowledge and skills to (1) use current research findings to improve practice, (2) use the process of research to examine questions identified in nursing practice, and (3) participate in collaborative research. This course will include integration of the following elements: critical thinking, current technologies for data management and statistical analysis, scholarly writing, scientific integrity and ethics and human diversity. Statistical procedures examined will include univariate and bivariate statistics, parametric and nonparametic procedures and selected epidemiological measures. Prerequisite: Under-
graduate statistics. 4 credit hours.

NUR 601. Role Development for Advanced Nursing Practice - This course is designed to prepare graduate nursing students to understand the concepts of advanced nursing practice and advanced practice nursing. Students will be expected to differentiate between advanced nursing practice and the practice of other nurses and health care providers. Concepts from a variety of models and theories from nursing and other disciplines will be discussed, and examples of how these concepts may be applied in advanced nursing practice will be offered. The concept of cultural competence will be explored as will its application when interacting with people from diverse ethnic and racial groups. 3 credit hours.

NUR 602. Issues Affecting Advanced Nursing Practice - This course prepares graduate nursing students to incorporate management and leadership skills in the practice arena. The health care environment and culture, selected organizational, economic, and financial theories, strategic planning, change theory, health care marketing and information and quality management will be explored in the context of contemporary issues such as bioterrorism and health care policy and regulation. This course will also include integration of the following elements: critical thinking, scholarly writing, research, theory evaluation and application, scientific integrity and ethics, human diversity and social issues. 3 credit hours.

NUR 609. Radiology for Advanced Practice - This course provides nurse practitioners and other mid-level providers with an introduction to radiography. The course provides the novice the opportunity to incorporate radiographic studies into working through a differential diagnosis. The course utilizes various common radiographic techniques including plain films, computed tomography and magnetic resonance imaging. 3 credit hours.

NUR 611. Management of Diabetes Mellitus (Type 1 and 2) - This course will provide a multi-disciplinary framework for the identification of those at risk or who already possess the metabolic syndrome, frank type 2 diabetes mellitus and its complications. A variety of management strategies will be presented from the perspectives of multiple healthcare disciplines. The perspectives of the multi-disciplinary team in assisting persons to achieve self-care goals are an important theme throughout this

course as are the current controversies, issues and research findings underlying present approaches to treatment and patient/family education. 3 credit hours.

NUR 612. Advanced Pathophysiology - This course is designed to provide the student with an opportunity to build upon existing knowledge of basic physiology and pathophysiology. Emphasis is placed on the use of critical thinking to apply physiologic principles in explaining adaptations to pathogenic changes in the systems discussed. 3 credit hours.

NUR 613. Pharmacology and Therapeutics - This course focuses on analysis and utilization of principles of pharmacology and pharmacokinetics for the purpose of planning, implementing, and evaluating therapeutics pharmacological interventions. The unique characteristics of special populations related to therapeutic needs, as well as drug absorption, metabolism, and excretion, are defined. 3 credit hours.

NUR 614L. Assessment and Diagnostic Reasoning for Advanced Nursing Practice - This course is designed to provide students with an advanced level of skill and knowledge in critical thinking and diagnostic reasoning for conducting health assessments and planning care for holistic, adaptive human beings. The following elements are integrated into the course: professional presentations, critical thinking, scientific integrity and ethics, human diversity, and social issues.
Pre or corequisite: NUR 612. 4 hours.

NUR 615. Sexuality Issues in Health and Illness: A Lifespan Approach - This course includes the ethical, social, biological, and psychological concepts of human sexuality. 3 credit hours.

NUR 618L. Clinical Diagnostic Reasoning - A modular organ system approach utilizing case studies will be used to pull together basic principles from pathophysiology, pharmacology and physical/health assessment to develop clinical diagnostic reasoning skills necessary for the nurse practitioner. This course is designed to provide students with an advanced level of skill and knowledge in critical thinking and diagnostic reasoning to apply in the subsequent clinical nursing courses. Students will utilize the knowledge and skills learned in NUR 618QL as they diagnose and manage the care of clients with acute, chronic, and episodic health problems throughout the life span. 4 credit hours.

NUR 619. Health Issues in Culturally Diverse Populations in the United States - This course provides students with an overview of health issues and health disparities confronting African American and Latinos in the United States. The course also addresses genetic, cultural, historical and demographic factors that influence these health issues and disparities, implications for culturally effective health care, and for development of health policy. 3 credit hours.

NUR 630. Principles of Epidemiology - This course is intended to provide the advanced practice nurse with a working knowledge of epidemiology and biostatistics as they relate to nursing practice. Additionally, phenomena along the wellness continuum will be discussed. The Natural History of Disease Model will be applied to the study of health and illness in human populations. 3 credit hours.

NUR 633. Growth and Development - The content of this course is centered on major theories of development including physiological, psychoanalytic, social, stimulus-response, cognitive and moral. Current areas and findings of research are investigated and research designs and methods are critiqued. Self-selected in depth studies are made and shared. Contributions of the study of development to the functional practice of nursing are demonstrated. 3 credit hours.

NUR 634. Perspectives in Global Health Leadership - This course is designed to provide students with an understanding of global aspects of health care leadership. The course will focus on identification of characteristics of global health care leaders, leadership theories, and strategies to develop one's own personal leadership abilities. The course will provide students with a unique opportunity to interact with health care leaders from countries around the world, and develop projects related to an aspect of global health care leadership of interest to each student. 3 credit hours.

NUR 642. Health Education and Social Welfare in a Global Community - The purpose of this course is to provide students with a cross-cultural experience in which they will spend time in a selected global community while learning about health, educational and social welfare issues. Students will participate in pre-trip seminar in Birmingham or on-line prior to travel. The seminar(s) will focus on an overview of the course, a model of assessing culture and an overview of selected global community's culture. Students will also participate in seminars on a variety of health, education and social welfare topics provided by the course instructor and by resource persons from the selected global community. 3 credit hours.

NUR 643. Introduction to Nursing Informatics - The organizing framework for this course is based on the three concepts that form the theoretical basis of nursing informatics, data, information and knowledge. Students will explore how data can be organized into information for the generation of knowledge through the design, selection and implementation of clinical information systems. The course has two sections: theory and laboratory. The theoretical content will focus on the collection, organization, analysis and dissemination of information in nursing and healthcare. Laboratory work will familiarize the student with computer applications designed to manage nursing and healthcare information. 3 credit hours.

NUR 644. Principles of Developmental Care Newborn Infants - Provides students with an overview of principles of individualized developmental care for newborns and infants. The course also addresses

principles of family-centered care as a key component of developmental care. Students review concepts and theories related to molecular biology, fetal, infant and family development, psychology and sociology in assessingand planning care to promote optimal development of high risk infants and families. Students explore roles of nurses and other interdisciplinary team members in developmental care are assessed, and develop plans to promote organizational change in order to incorporate developmental care principles in a clinical setting. 3 credit hours.

NUR 667. Psychosocial Aspects of Evidence-Based Practice in Chronic Illness - This course is organized around the concepts of evidence-based practice, psychosocial nursing and chronic illness. The chronic illness trajectory across the individual s and family s life span and the needs of vulnerable populations with attention to disparity of care and cultural competence of involved health care providers is included. This course is designed to provide the undergraduate student with the basic knowledge and skills needed to provide evidence-based interventions and the graduate student to analyze needs for development of interventions to address the psychosocial needs of those with chronic illness. 3 credit hours.

NUR 670. Occupational Health Management Principles - This course provides the student with a working knowledge of management topics specific to planning, directing, and evaluating occupational health services. 1 credit hour.

NUR 671. Principles and Practice of Occupational Toxicology and Disease – This course is designed to provide the student with an opportunity to build upon existing knowledge of physiology and pathophysiology. Emphasis is placed on the use of critical thinking to assess risk, determine effects, and plan strategies to minimize effects of toxicant exposure and occupational diseases in worker populations. 3 credit hours.

NUR 674L. Evaluation and Management of Occupational Health and Safety Programs – The aim of NUR 674QL is to provide the occupational health student with a working knowledge of program planning and managerial processes in occupational settings. This graduate course is designed to give the master's student an opportunity to actively explore factors which influence the delivery of occupational health and safety services and to critically evaluate the role functions of managers of those services. Decision-making processes related to financial management and resource allocation, along with management of health and safety programs, will be emphasized. Planning for and implementing a worksite occupational health and safety intervention in industry at the aggregate level will be a major part of the course. 1 – 2 credit hours.

NUR 686. Honors Seminar III - This required course for Honors Program students provides

opportunities for implementation of an innovative evidence-based practice strategy which integrates human responses to health and illness and professional practice roles. Course content includes clinical or research experiences in innovative practice approaches, discussions of implications for evidence-based practice and professional nursing roles, and guidelines for preparation of manuscript and presentations. Professional expectations include dissemination of findings through a public forum and collaboration with agencies for integration of findings into practice. 3 credit hours.

NUR 690. Independent Study in Nursing - Course allows concentration on a selected topic of interest relevant to the Program of Studies. 1 - 6 credit hours.

NUR 691. Independent Study in Clinical Nursing - Course provides for clinical learning activities which are in addition to the activities in the regular clinical sequence of a given option. Students apply or test out theories and knowledge obtained in established or independent study theory courses. 1 - 6 credit hours.

NUR 698. Research Practicum - : This graduate course is designed to give the master's nursing student an opportunity to actively participate in the research process. This practicum course allows students to assume limited responsibilities in the development, execution, and/or dissemination of a research study by performing selected roles within the research team. It is acknowledged that given the limited time allotted to the practicum, students may only have the opportunity to participate in one phase of a study due to the extended period usually required to initiate and conduct a study, or to compile the data to present results to target audiences. This course may include integration of the a wide range of experiences such as: using informatics, data management, using statistical analysis software programs, scholarly writing, and preparing or giving presentations to professional or lay audiences. The advanced practice role emphasis of this course is that of investigator and research collaborator. 1 - 2 credit hours.

NUR 699. Thesis Research - The thesis is the result of original research work undertaken by the student and the interpretation of those results. The document should also demonstrate the candidates' acquaintance with the literature of the field and with proper selection and execution of research methodology. The physical form of the thesis must comply with published departmental and university guidelines for theses and dissertations. The student works under the guidance of a major professor with a committee of faculty members. However, the obligations of research, accuracy, writing, and quality rest with the student. A public defense of this work is expected. A minimum of four hours of credit is required for completion of thesis hours, although a variable number of hours may be taken per term as necessary. The advanced practice role emphasis of this course is that of investigator, research collaborator, and author. 1 – 4 credit hours.

NWH 631 Women's Health for Advanced Nursing Practice I This is a required theory course for

students in the combined Primary Adult/Women's Health nurse practitioner specialty and will be applied in the required clinical courses. It also may be taken as an elective by students in other master's specialties with the permission of the instructor. In this course, students acquire knowledge that is relevant to the specific nursing and medical management of the health of women. The course is designed to provide students with the opportunity to integrate knowledge of the diagnosis and management of women's primary care health concerns with knowledge concerning the management of health care of adults. The emphasis in the course is on providing students with the background to apply this knowledge with the population of women in required clinical courses. Concepts are covered which are specific to caring for the uncomplicated gynecologic and/or obstetric needs of women from menarche to the end of life. Health promotion and disease prevention, and recognition of deviations from normal are incorporated. Content includes management strategies from the domains of nursing and medicine, pharmacological therapeutics, and direct care within the scope of practice of women's health nursing. 3 hours

NWH 632 Women's Health for Advanced Nursing Practice II This is the second of two required theory courses for students in the Nurse Practitioner Dual Adult/Women's Health primary care specialty. Knowledge acquired in NUR 614L and NWH 631 provides a foundation for the management of the care of women with increasingly complex health problems. NWH 632 is designed to expand the foundation of theoretical knowledge for the nurse practitioner and prepare the student for full scope of practice in a clinical residency. Prerequisite: NWH 631 and NWH 685L. Corequisite: NWH 686L. 3 hours

NWH 685L. Practicum I: Women's Health Nurse Practitioner - This course prepares the student in the Women's Health Nurse Practitioner role. The student develops the Women's Health Nurse Practitioner role with patients/ clients by providing health care services to clients (i.e. individuals, families, groups), emphasizing the promotion of health and the prevention of disease throughout the course of clinical experiences over two or three academic terms. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. It is anticipated that the student will be increasingly independent and skilled as each clinical experience progresses, allowing him/her to become more proficient and to contribute to the management of more complex health problems. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity and social issues. The advanced practice role emphasis in this course encompasses a trajectory of the nurse practitioner experience from novice to beginning expert, and includes interdisciplinary collaboration, coach, educator, and may include consultant. The student and faculty cooperatively determine clinical sites for the practicum. 1 – 3 credit hours.

NWH 686L. Practicum II: Women's Health Nurse Practitioner - NWH 686L prepares the student in the

women's health nurse practitioner role. In practicum II, the student continues to develop the WHNP role with patients/clients by providing primary health care services to clients (i.e., individuals, families, and groups) emphasizing the promotion of health and the prevention of disease. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human response to disease. An Objective Structured Patient Experience held during this course will determine if the student can progress into 6 hours of the final residency course. The student and faculty cooperatively determine clinical sites for the practicum. Prerequisite: NWH 685L. Corequisite: NWH 632. 1 – 3 credit hours.

NWH 692L. Residency: Women's Health Nurse Practitioner - This course prepares the student in the Women's Health Nurse Practitioner role to be a beginning expert in the diagnosis and management of women's health problems. In the residency, the student is expected to continue growth toward becoming an independent practitioner, specializing in the care of women. The student further develops the Women's Health NP role with patients/clients by providing health care services to clients (i.e. individuals, families, groups), emphasizing the promotion of health and the prevention of disease. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity, and social issues. The advanced practice role emphasis in this course continues the trajectory of the nurse practitioner experience from novice to beginning expert, and includes role components such as interdisciplinary collaborator, coach, educator, and consultant. A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation. The student and faculty cooperatively determine clinical sites for the practicum. Prerequisite: NAH 622. 3 - 6 credit hours.

Vision Science (M.S., O.D./M.S., Ph.D. (Traditional and Sensory Impairment Tracks)

Degree Offered: Ph.D.(Traditional and Sensory Impairment tracks), M.S., O.D./M.S.

Program Manager : Dr. Ramona Hart Hicks

Phone: (205) 934-6743

E-mail: rhart@uab.edu

Web site: **www.visionscience.uab.edu**

Faculty

Franklin R. Amthor, Professor (Psychology)

Claudio Busettini, Assistant Professor (Vision Sciences)

Stephen Barnes, Professor (Pharmacology/Toxicology)

William J. Benjamin, Professor (Optometry)

Christine A. Curcio, Professor (Ophthalmology)

Lawrence J. DeLucas, Professor (Optometry)

Allan C. Dobbins, Associate Professor (Biomedical Engineering)

Patti S. Fuhr, Clinical Associate Professor (Optometry)

Roderick J. Fullard, Associate Professor (Vision Sciences)

Paul D. R. Gamlin, Chair/Professor (Vision Sciences)

Timothy J. Gawne, Assistant Professor (Vision Sciences)

Christopher A. Girkin, Chair/Professor (Ophthalmology)

Alecia Gross, Assistant Professor (Vision Sciences)

Kent T. Keyser, Professor (Vision Sciences)

Robert N. Kleinstein, Professor (Optometry)

Timothy W. Kraft, Assistant Professor (Vision Sciences)

Robin A.J. Lester, Professor (Neurobiology)

Michael Loop, Associate Professor (Vision Sciences)

Lei Liu, Associate Professor (Optometry)

Lori McMahon, Professor (Cell, Developmental & Integrative Biology)

Thomas T. Norton, Professor (Vision Sciences)

Cynthia Owsley, Professor (Ophthalmology)

Steven J. Pittler, Professor (Vision Sciences)

Lawrence Sincich, Assistant Professor (Vision Sciences)

Harold Sontheimer, Professor (Neurobiology)

Om P. Srivastava, Professor (Vision Sciences)

Kristina Visscher, Assistant Professor (Neurobiology)

Shu-Zhen Wang, Associate Professor (Ophthalmology)

David Whikehart, Professor Emeritus (Vision Sciences)

Xincheng Yao, Assistant Professor (Biomedical Engineering)

Program Information

Envision yourself in a lab conducting cutting–edge research that may lead to improved treatments for glaucoma or cataract, gene therapy for blinding retinal diseases, or provide fundamental information on how the brain works so that we can we see. Envision yourself using the knowledge and research skills you gain as a student to establish your own research lab, serve as a scientific advisor to governments or the military, or teach at the graduate or undergraduate level. These are just a few of the many possibilities available to graduates of the Vision Science Graduate Program.

Through basic, translational, or clinical research, the Vision Science Graduate Program offers opportunities to investigate all facets of vision, including (but certainly not limited to) visual neuroscience, the genetics of blinding diseases, visual perception, all areas of the eye and the visual regions of the brain using a variety of techniques, including functional brain and eye imaging. Our didactic courses provide fundamental knowledge about the biological bases of vision. Laboratory research provides intensive involvement with a faculty member and other students to prepare students for postdoctoral

study or other research environments. We have the most up-to-date advanced equipment to address our research from many avenues of exploration to solve the most difficult problems. We actively foster unique inter- and intra-departmental laboratory collaborative efforts to exploit the full benefits of UAB's resources and explore students' full potential.

Admission and Financial Aid

Applications for admission to the graduate program in vision science are reviewed by the Graduate Admissions and Advisory Committee.

M.S. Degree	O.D./M.S.	Ph.D. Traditional Track	Ph.D. Sensory Impairment Track
GRE Score Required	OAT Score Required	GRE Required	GRE or MAT recommended
	Financial Assistance available to qualified students	Financial Assistance available to qualified students	

M.S. Degree

Some students may wish to pursue graduate training at the master's level. Two calendar years are needed to complete the M.S. degree in vision science. Each candidate must complete a minimum of 30 hours of credit: 24 credit hours in vision science and 6 credit hours in related graduate courses.

In addition, the candidate must successfully complete a research thesis by the conclusion of the final year.

O.D./M.S.

Selected students in the UAB optometry professional program are encouraged to combine the O.D. degree with the M.S. degree in Vision Science. Financial assistance is available for qualified students. Potential candidates should have completed undergraduate degree in a biological, physical, or health science field.

Ph.D. Degree (Traditional and Sensory Impairment Tracks)

The Ph.D. degree is based upon completion of graduate course work, a qualifying examination, research,

and a dissertation and defense. There is considerable flexibility in the coursework for the Ph.D. in vision science.

Each student is required to take the first-year core curriculum for their respective track. Students then take three additional courses, selected by the student in consultation with the mentor, and a course in statistics and ethics. The program is flexible so that, for example, students who have interests in visual neuroscience may take courses in the neuroscience sequence: VIS 729, Introduction to Neurobiology; Cellular and Molecular Neurobiology; Integrative Neuroscience; and Developmental Neuroscience.

Other courses at a similar level can be substituted so that students can take maximum advantage of offerings in other programs. Individuals with clinical backgrounds will have an opportunity for clinical development. Students are also offered an opportunity to gain teaching experience.

Additional Information

Deadline for Entry Term(s):	Summer and Fall
Deadline for All Application Materials to be in the Graduate School Office:	January 15th
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.) OAT is considered for the OD/MS program. MAT or GRE is considered for the PhD Sensory Impairment Track
Website	Visionscience.uab.edu

For detailed information, contact the graduate program manager, Dr. Ramona Hart, UAB Department of Vision Science, WORB 601A, 1530 3rd Ave S., Birmingham, AL 35294-4390 (office location: Worrell Building, Room 601A, 924 18th Street South).

Telephone 205-934-6743

E-mail rhart@uab.edu

Web **www.visionscience.uab.edu**

Course Descriptions

Vision Science (VIS)

455 – Electronics for Biologists (3) - This course provides an overview of the fundamental concepts of electronics that are of relevance to a biologist. The material is aimed at non-engineers who need a background in the circuit concepts needed for studying ion channels, electrophysiology, the basics of the proper use of amplifier and filters, and the use of computers to acquire and analyze data. There will be a mix of formal lectures and problem sets with practical hands-on experience.

456 – Visual Neuroscience (4) - Vision begins with photons and ends in the brain. How does it all work? This course introduces the student to the anatomical and physiological underpinnings of visual perception, stepping from single photoreceptors in the retina on through the cortical neural circuits devoted to capturing every facet of seeing the world. Lectures are supplemented with hands-on sessions where students can test their own vision.

700 – Literature Review (1) – Vision Science and Visual Neuroscience related literature review and presentation.

743 - Optics and Imaging (3) - Optical properties of the eye. Transparency, aberrations, modulation transfer functions of the eye. Use of coherent optics (lasers) in vision research, MRI in vision research.

744 - Ocular Anatomy, Physiology and Biochemistry of Anterior Segment (3) - Anatomy of the eye. Biochemistry and physiology of ocular tissues, including tears, cornea, aqueous humor, lens, vitreous and sclera.

745 – Biology and Pathology of the Posterior Segment (3) - Examination of ocular anatomy, biochemistry, biology and pathology of the posterior eye.

755 – Electronics for Biologists (3) - This course provides an overview of the fundamental concepts of electronics that are of relevance to a biologist. The material is aimed at non-engineers who need a background in the circuit concepts needed for studying ion channels, electrophysiology, the basics of the proper use of amplifier and filters, and the use of computers to acquire and analyze data. There will be a mix of formal lectures and problem sets with practical hands-on experience.

756 – Visual Neuroscience (4) - Vision begins with photons and ends in the brain. How does it all work? This course introduces the student to the anatomical and physiological underpinnings of visual perception, stepping from single photoreceptors in the retina on through the cortical neural circuits

devoted to capturing every facet of seeing the world. Lectures are supplemented with hands-on sessions where students can test their own vision.

760 – Sensory Impairment Literature Review (1) - Sensory Impairment and Deafblind literature review and presentation

761 – Neurobiology & Development of the Human Visual System I (3) - This course is a two part sequence that provides in-depth studies of anatomy and physiology of retina and other ocular structures. Basis for understanding of genetic abnormalities and disease processes.

762 – Neurobiology & Development of the Human Visual System II (3) - This is the second sequence providing in-depth studies of anatomy and physiology of the auditory systems. Basis for understanding of genetic abnormalities and disease processes. Provides comprehensive exploration of development of embryotic and prenatal visual and auditory systems.

763 – Central Visual Processing (4) - Analysis of the visual scene by cortical neurons, including temporal coding, motion detection, shape analysis, leading to visual perception. Structure and function of geniculostriate parallel pathways, subcortical projections, and the oculomotor system.

764 – Sensory Impairments (3) - The course includes the development, anatomy, histology and physiology of deafblindness, relating structure to function. The focus is presentation of deafblind etiology and implications of visual/auditory disorders related to deafblindness.

765 – Auditory Impairments (3) - The course builds in the basic auditory structure and sequence from outer ear to the auditory cortex. The course includes the development, anatomy, histology and physiology of the auditory systems, relating structure to function. The focus is presentation of etiology and implications of auditory disorders. Psycho-acoustics will focus on the perceptual aspects of sound and acoustic representation in the auditory pathway. Audiological assessment and technological resources appropriate for persons with deafblindness.

766 – Deafblind Analysis of Sensory Impairments (3) - The course involves additional audio metric and vestibular assessments, approaches and accommodations for deafblindness, implications of deafblindness on sensory integration for communication and learning and the impact of medical conditions and additional impairments. Also included is the relevance of brain development and neurological implications of deafblindness to teaching and learning.

767 – Deafblind Communication and Technology (3) - The course provides an understanding language, sign language, Braille, development of stages of learners and the effects of timely intervention.

Knowledge of genetic development and frequently occurring anomalies related to deafness, blindness and deafblindness are included in the research and class design. An understanding of the implications and interventions for multiple disabilities including deafblindness are presented as well as technology used for communication and appropriate interventions for technology. Instructional planning, strategies of intervention, and research to practice for communication based on language level of a person's neurological functions and sensory integration are the competencies addressed in this course.

Public Health

Biostatistics (Ph.D., M.S., M.S.P.H.)

Degree Offered:	M.P.H., M.S., M.S.P.H., Ph.D.
Director:	*Aban*
Phone:	(205) 934-2732
E-mail:	bstgrad@uab.edu
Web site:	**http://www.soph.uab.edu/bst**

Faculty

Inmaculada (Chichi) Aban, Ph.D. (Bowling Green State), Associate Professor. *Clinical Trials, Model Diagnostics, Survival and Reliability Analysis, Inference for Heavy Tailed Distributions.*

Alfred A. Bartolucci, Ph.D. (SUNY, Buffalo), Professor Emeritus. *Clinical Trials, Survival Analysis, Bayesian Statistics, Longitudinal Data Analysis.*

Timothy Mark Beasley, Ph.D. (Southern Illinois - Carbondale), Associate Professor. *Linear Models, Linkage and Association with Quantitative Traits, Nonparametric Methods, Microarray Analysis.*

Stacey S. Cofield, Ph.D. (Virginia Commonwealth), Associate Professor. *Mixed-Effects Models, Clinical Trial Design, Management, and Analysis, Out-of-Hospital Cardiac Arrest and Resuscitation.*

Xiangqin Cui, Ph.D. (Iowa State), Associate Professor. *Microarray Analysis, Quantitative Trait Locus Analysis.*

Gary Cutter, Ph.D. (Texas Health Science Center - Houston), Professor and Head of the Section on Research Methods and Clinical Trials. *Clinical Trials and Community Studies Trial Analyses, Chronic Disease Epidemiology, Large Scale Data Bases, Multiple Sclerosis, Myasthenia Gravis and Neonatal Trials, Behavioral Studies.*

Gustavo de los Campos, Ph.D. (University of Wisconsin-Madison). Assistant Professor, Section on Statistical Genetics. *Quantitative Genetics, Statistical Learning and Prediction, Semi-parametric and Bayesian Methods.*

Naomi Fineberg, Ph.D. (Boston University), Research Professor and Chair. *Small Medical Studies.*

George Howard, DrPH (North Carolina), Professor. *Design and Analysis of Multi-center Clinical Trials, Application of Statistical Methods in Epidemiological Studies, Linear Models.*

Suzanne E. Judd, Ph.D. (Emory), Assistant Professor. *Vitamin D, Longitudinal Cohort Studies, Cystic Fibrosis and Bone Health, Data Management.*

Charles R. Katholi, Ph.D. (Adelphi), Professor Emeritus. *Computationally Intensive Statistical Methods, Large Sample Theory, Use of Asymptotic Tests in the Presence of Small Samples, Estimation and Testing Infection Potential by Pool Screening.*

Richard Kennedy, Ph.D. (Virginia Commonwealth University), *Assistant Professor. Longitudinal data modeling, cognitive function, clinical trials simulations, gene expression analysis.*

Nianjun Liu, Ph.D. (Yale), Associate Professor. *Genetic Linkage and Association Analysis, Disequilibrium Mapping, Population Genetics, Bioinformatics, Machine Learning Methods and Longitudinal Data Analysis and Their Applications in Genetics and Bioinformatics.*

Xiang-Yang Lou, Ph.D. (Zhejiang), Associate Professor. *Linkage and Association Analysis, Disequilibrium Mapping, Population Genetics, Bioinformatics, Machine Learning Methods and Longitudinal Data Analysis and Their Applications in Genetics and Bioinformatics.*

Leslie Ain McClure, Ph.D. (Michigan), Associate Professor and Director of Graduate Studies. *Clinical Trials with Multiple Outcomes, Interim Analysis.*

Morgan, Charity Morgan, Ph.D. (Harvard University), Assistant Professor. *Finite Mixture Models. Bayesian Data Analysis. Multiple Sclerosis. Psychopathology.*

David T. Redden, Ph.D. (Alabama), Professor. *Regression Diagnostics, Admixture, Association Studies.*

Jeffery Szychowski, Ph.D. (Alabama), Assistant Professor. *Clinical Trials, Maternal and Fetal Medicine Studies, Regression Analysis and Smoothing Methods, Categorical Data Analysis, Survival Analysis.*

Hemant K. Tiwari, Ph.D. (Notre Dame), Professor and Head of the Section on Statistical Genetics. *Genetic Linkage and Association Analysis, Haplotype Analysis, Disequilibrium Mapping, Population Genetics, Molecular Evolution, Bioinformatics.*

Laura Kelly Vaughan, Ph.D. (Texas A&M), Research Assistant Professor. *Genetic Linkage and Association Studies, Population Stratification, Bioinformatics.*

Nengjun Yi, Ph.D. (Zhejiang), Professor. *Statistical Genetics/Genomics, Bayesian Statistics, MCMC Algorithms.*

Kui Zhang, Ph.D. (Peking), Associate Professor. *Statistical Methods for Molecular Biology and Genetics, Linkage and Disequilibrium Analysis, Functional Genomics.*

Xiao Zhang, Ph.D. (UCLA), Research Assistant Professor. *Bayesian Computation, Clinical Trials.*

Degui Zhi, Ph.D. (UCSD), Assistant Professor. *Protein sequence and structure analysis, Bioinformatics, Next-generation sequencing data analysis.*

General Information

The Department of Biostatistics at the University of Alabama at Birmingham (UAB) is one of five departments in the School of Public Health: Biostatistics, Environmental Health Science, Epidemiology, Health Behavior, and Health Care Organization and Policy.

Dr. Naomi Fineberg is the Chair of the department, Dr. Leslie McClure is the Director of Graduate Studies, and Della Daniel is the department liaison to the graduate program. The department currently has 24 faculty members, 56 full-time staff, and is organized into two sections: 1) The Section on Statistical Genetics (SSG), led by Dr. Hemant Tiwari and 2) The Section on Research Methods and Clinical Trials (RMCT), led by Dr. Gary Cutter. Members of the department conduct research in statistical methodology and applications, as well as in fundamental problems of modeling in biological systems. Much of the department's research is collaborative in nature involving projects from basic science, genetics, clinical medicine, public health, and other health-related areas, both within and outside of UAB.

Grant support for faculty in the department fall into four broad areas: 1) applied grants involving the application of statistical methods to health-related issues, 2) statistical coordinating centers for large multi-center randomized clinical trials, 3) methodological grants advancing statistical techniques, and 4) training grants for preparing the next generation of statisticians.

The Department offers programs leading to the Doctor of Philosophy (PhD), Master of Science (MS), Master of Public Health (MPH), Master of Science in Public Health (MSPH), and a Certificate in Statistical Genetics (CSG). The MS and PhD degrees are offered through the Graduate School. The MPH and MSPH degrees are offered through the School of Public Health.

MPH in Biostatistics

The MPH degree in biostatistics is intended primarily for those who wish to acquire an MPH degree with an emphasis on statistical methodology. This can include individuals from decision-making positions in health care settings as well as those interested in data management, statistical analyses and interpretation, and presentation of analytical results. This degree can be completed in approximately 2 years. Note that the MPH does not require some of the theoretical courses required for the MS, and as such, it is not a direct route to prepare a student for a PhD. **Students anticipating that they will wish to continue for a PhD in biostatistics are advised to pursue the MS rather than the MPH.**

All international students must demonstrate proficiency in spoken and written English before graduation, through the Graduate School's ESL Assessment. Dependent on the results of that assessment, the GPC may require additional course work in both written and/or oral English for students not showing proficiency upon arrival, or during any period of their graduate studies.

Required Courses: MPH in Biostatistics

MPH Core:	ENH 600	Fundamentals of Environmental Health Sciences	3 Credit hours
	EPI 600 OR	Introduction to Epidemiology	3 Credit hours
	EPI 610	Principles of Epidemiology Research	4 Credit hours
	HB 600	Social and Behavioral Sciences Core	3 Credit hours
	HCO 600	Introduction to Public Health Systems	3 Credit hours

		And Population-Based Health Programs	
	PUH 695	Public Health Integrative Experience	1 Credit hours
	GRD 727	Writing and Reviewing Research	3 Credit hours
Biostatistics Core:	BST 619	Data Collection and Management	3 Credit hours
	BST 621	Statistical Methods I	3 Credit hours
	BST 622	Statistical Methods II	3 Credit hours
	BST 626/626L	Data Management/Reporting with SAS	3 Credit hours
	BST 697	Internship in Biostatistics	3 Credit hours
Biostatistics Electives: Minimum 9 credit hours of regular courses of 623 or higher-level.			
Outside Electives: A minimum of 3 graduate credit hours of electives must be taken from some field of Biology, Public Health or Medicine. The academic advisor must approve these courses.			

The MPH Non Coursework Requirements: The Internship

As a student in the MPH program, you are required to complete three credit hours of an internship experience. The internship is a field experience which bridges professional academic preparation and public health practice. Knowledge and skills learned in coursework are applied in an agency setting under the supervision and guidance of an experienced public health specialist. You may check with the schools internship coordinator Emily Tubergen (ejt3@uab.edu or 934-7791), or the school's website at www.soph.uab.edu/internships for internship opportunities. Faculty research projects are not appropriate venues for an internship, nor are positions which are primarily administrative or focused on data management.

Registering for Internship Experience

Before the hold on the internship course can be lifted, we require that the internship description and agreement form is completed and on file. This form is to be completed in the online internship database Intern Track. You can log in to this program with your BlazerID and password at www.soph.uab.edu/interntrack. Your faculty advisor and site supervisor will also be required to sign off on this document, so it is important that you communicate with them as you complete the form, and do

not wait until the deadline to register. A hyperlink allowing you to formally request the hold to be lifted will become active once all the signatures are on file.

You should register under your academic advisor for BST 697 – Internship in Biostatistics. For three credit hours, you are expected to spend a minimum of 240 hours during the 12 weeks working for the agency. The internship must be completed in one semester, and all hours must be completed by the last day of exams. You are required to complete your core course work before registering for internship hours. Credit cannot be applied retroactively to work you have done prior to registering for the internship. Students should feel free to contact the Graduate Program Director (Dr. McClure) or Internship Coordinator (Emily Tubergen) if they have any questions or problems during the summer.

Grading and Requirements

The internship is a pass/fail course. Your grade will be assigned by your faculty advisor based on the completion of all the components below. All forms related to the MPH internship will be completed in the InternTrack program.

- Internship Description and Agreement Form
- Midpoint Meeting Form, and confirmed meetings with the faculty advisor and site supervisor
- Final student evaluation
- Final student paper
- Completion of poster and attendance at the internship poster session
- Evaluations (Midpoint and Final) from the site supervisor
- Any additional product required by your internship site

Midpoint meeting: You will be required to complete a midpoint form halfway through your internship. This is to prompt your reflection on the internship to that point, and steps to make the remainder of the internship a success. You will set up times to individually meet with your faculty advisor and site supervisor; use the midpoint form as a guide for your conversation. If you are not able to meet in person, discussions via telephone, email, or Skype will be accepted. Your faculty advisor and site supervisor will need to confirm the meeting took place in the Intern Track system.

Internship Poster Session: At the end of the internship, prior to the end of exams for that semester, a poster session will be held to showcase the internships completed during that semester. You will receive additional instructions on creating your poster prior to the event. Attendance is mandatory, as it is a required component to the internship experience. Limited exceptions will be made for students completed internships out of the state or country or that are completing the MPH program online.

For complete internship requirements please check out the syllabus on the UAB School of Public Health website: https://www.soph.uab.edu/files/internship/InternshipSyllabus2011.pdf.

MSPH in Biostatistics

There is a growing interest in medical and other health science schools in developing the clinical research skills of faculty members and fellows. This interest has been fueled by increased support from the National Institutes of Health (NIH) to prepare such individuals to meet the demand for clinical investigators in the field. Locally, the Schools of Medicine and Public Health have combined efforts to create a training program for young faculty members and fellows from a variety of disciplines.

This program is a post-medical or other health science degree training program, aimed primarily at fellows and faculty members interested in developing skills required for clinical research. It is anticipated that this academic training will supplement extensive training in the content area in which the student is trained, and senior mentoring in the politics and policies of project development and management. A graduate of this program will have the academic training to develop and lead independent research programs and projects. The program consists of a core set of courses common to all students, plus research elective and focus elective courses that reflect the academic interest of the student. At this time, the program can accommodate students with specific interest in biostatistics (CTBS), epidemiology (CTE), and health behavior (CTSH). As a result, there will be some variation in the specific knowledge and skills acquired by each graduate. However, the primary learning objectives will apply to all students, irrespective of departmental affiliation. As such, graduates will be able to do the following upon completion of the program:

- design, conduct and evaluate clinical research studies;
- understand issues of data collection and study management;
- follow appropriate policies and procedures relating to the utilization of human subjects in clinical research;
- demonstrate an understanding of the ethics of research on human subjects;
- prepare competitive applications for extramural research funding;
- prepare manuscripts for publication in the scientific literature; and
- critically evaluate published research.

Required Courses: MSPH in Biostatistics

The MSPH in Clinical and Translational Science consists of a minimum of 41 credit hours. Of these, 14 hours are required, including 9 hours of specific Biostatistics courses and 5 hours of specific Epidemiology courses. Students then select at least 9 credit hours from a list of approved Masters

Research Electives, complete 9 hours of focus specific electives in Biostatistics, and take at least 9 hours of directed (698 level) Masters research to fulfill the MSPH requirement for conducting a research project. All international students must demonstrate proficiency in spoken and written English before graduation, through the Graduate School's ESL Assessment. Dependent on the results of that assessment, the GPC may require additional course work in both written and/or oral English for students not showing proficiency upon arrival, or during any period of their graduate studies.

Coursework **Required Core Courses**		**Credit Hours** **14**
BST 621	Statistical Methods I	3
BST 622	Statistical Methods II	3
BST 625	Design and Conduct of Clinical Trials	3
EPI 607	Epidemiology of Clinical Research	3
EPI 680	Topics in Clinical Research (P/NP) [1]	2
Masters Research Electives [2]		**9**
A minimum of 9 credit hours taken from the following courses (selected by faculty advisor and student):		
BST 619	Data Collection and Management	3
BST 626/626L	Data Management/Reporting with SAS (3 hours)	3
ENH 650	Essentials of Environmental and Occupational Toxicology and Diseases	5
EPI 625	Quantitative Methods in Epidemiology	3
EPI 703	Special Topics in the Epidemiology of Chronic Disease (This course focuses on Writing proposals	3

	for funding)	
EPI 709	Theoretical Basis of Epidemiology	3
HB 624	Advanced Theory and Practice in Behavioral Science	3
HCO 677	Patient-Based Outcomes Measurement	3
	_____	
[1] EPI 680 is a two credit hour class in which students attend and participate in lectures provided through the K30 Clinical Studies program at the School of Medicine. The grading is on a Pass/No Pass basis. To earn a grade of Pass, students must attend a minimum of 80% of the lectures over two semesters and participate in all discussion for which they are present.		
[2] Care must be exercised when selecting these courses since some have prerequisites that must be taken earlier in the sequence of classes or taken concurrently.		

Biostatistics Electives: Minimum 9 credit hours of regular BST courses of 623 or higher-level. With approval of the advisor, courses included in the research electives that are not taken to meet that requirement may be taken as part of the focus specific electives.

Masters Project Research: Minimum 9 credit hours of supervised research in clinical setting (BST 698).

The MSPH Research Project

The student, with the advice of his/her chosen MSPH project co-directors forms a small committee to guide the research project. The committee co-chairs should consist of a faculty member from Biostatistics and an MD with experience in the area of clinical research. Upon successful completion of the project, the student must submit a final write-up of the research.

MS in Biostatistics

The MS degree in Biostatistics is intended primarily for those who wish to acquire a master's degree with an emphasis in statistical methodology. Generally, students who anticipate a career performing data management and statistical analysis would enroll in the MS program. Further, the MS program is the appropriate program to prepare students to enter the PhD. Successful completion of this degree requires a GPA of 3.0 or better, passing the comprehensive examination at the MS level, completion of a master's project under the direction of an advisor with committee approval, and oral and written defense of this project.

All international students must demonstrate proficiency in spoken and written English before graduation, through the Graduate School's ESL Assessment. Dependent on the results of that assessment, the GPC may require additional course work in both written and/or oral English for students not showing proficiency upon arrival, or during any period of their graduate studies.

Required Courses: MS in Biostatistics

Biostatistics Core:	BST 621	Statistical Methods I	3 Credit hours
	BST 622	Statistical Methods II	3 Credit hours
	BST 623	General Linear Models	3 Credit hours
	BST 626	Data Management / SAS	3 Credit hours
	BST 631	Statistical Theory I	4 Credit hours
	BST 632	Statistical Theory II	4 Credit hours
	BST 655	Categorical Data Analysis	3 Credit hours
	BST 691	Biostatistics Predoctoral Seminar Series	4 Credit hours
Biostatistics Electives:	Minimum 6 credit hours of regular courses of 624 or higher-level. For those students planning to go on for the Ph.D., it is a good idea to take more advanced biostatistics courses as electives.		
Outside Requirement:	EPI 610 Principles of Epidemiological Research (or another comparable course in Epidemiology)		4 Credit Hours
Outside Electives:	A minimum of 3 additional graduate credit hours of electives must be taken from a non-quantitative field (i.e. Biology, Public Health or Medicine). The academic advisor must approve these courses.		

Upon completion of the first year-and-a-half of course work, the candidate is given a written examination consisting of two parts - Applied Statistics and Theory of Statistics. The exam will test the students on their understanding and comprehension of the foundation of the theory and applications of statistics, and will generally cover materials from BST 621, 622, 623, 626, 631, 632 and 655. This will be a standard departmental exam, administered by the Graduate Program Committee (GPC). The criteria for evaluation

are the candidate's understanding and competency in basic principles and foundations of biostatistics, understanding of the appropriate use and interpretation of statistical methods, and ability to succinctly express in writing the results of the problems. This examination is offered during the first half of January. At first attempt, a student must take both parts at the same time. For those years during which at least one student needs to take the exam a second time, the exam may be offered in July at the discretion of the GPC. Students must be registered for at least 3 semester hours of graduate work during the semester in which the comprehensive examination is given.

The student must pass each part of the exam at the Masters level. If a student fails either part of the exam, one additional chance will be given to retake the part of the exam that was failed. A student who fails the qualifying exam more than once will be dismissed from the MS program. The student has the opportunity to appeal the decision of his/her dismissal. The Graduate School policies on dismissal from the program and appeal of dismissal are described in detail in the UAB Student Handbook.

The MS Project

Immediately after passing the MS Comprehensive examination, the student must form a research project committee consisting of at least 3 members, chaired by the research advisor. Upon successful completion of the project, the student must submit a final write-up of the research and present their work orally in a departmental seminar. It is strongly suggested that the write-up is such that it may lead to an article submitted for publication in the subject matter area. The date and time of the oral presentation will be advertised in the Ryals Building.

PhD in Biostatistics

The PhD degree in biostatistics provides a balance between theory and application. In addition to providing students with an in-depth understanding of statistical theory and methodology, the main objectives of the program are to train students to become independent researchers, effective statistical consultants and collaborators in scientific research, and effective teachers.
All international students must demonstrate proficiency in spoken and written English before graduation, through the Graduate School's ESL Assessment. Dependent on the results of that assessment, the GPC may require additional course work in both written and/or oral English for students not showing proficiency upon arrival, or during any period of their graduate studies.

Required Courses: PhD in Biostatistics

All students entering the PhD program are required to complete the coursework required for the MS degree. It is possible for a student entering the graduate program with an MS degree in statistics or biostatistics from another institution to waive up to 12 credit hours of coursework at the discretion of the

GPC. It will be the student's option whether to actually obtain the MS degree, but the department strongly encourages them to do so, since the completion of the MS project is very good research experience and may lead to a publication.

PhD students are required to take the following courses:

Biostatistics Core:	BST 621	Statistical Methods I	3 Credit hours
	BST 622	Statistical Methods II	3 Credit hours
	BST 623	General Linear Models	3 Credit hours
	BST 626	Data Management / SAS	3 Credit hours
	BST 631	Statistical Theory I	4 Credit hours
	BST 632	Statistical Theory II	4 Credit hours
	BST 655	Categorical Data Analysis	3 Credit hours
	BST 691	Biostatistics Predoctoral Seminar Series	6 Credit hours
	BST 723	Theory of Linear Models	3 Credit hours
	BST 735	Advanced Inference	3 Credit hours
	BST 760	Generalized Linear and Mixed Models	3 Credit hours
	BST 765	Advanced Computational Methods	3 Credit hours

Biostatistics Electives:	Minimum 12 credit hours of 624 or higher-level regular courses, including at least 9 hours of 700 level courses.		
Outside Requirement:	EPI 610	Principles of Epidemiological Research	4 Credit Hours
Outside	A minimum of 3 additional graduate credit hours of electives must be taken from a		

Electives:	non-quantitative field (i.e. Biology, Public Health or Medicine). The academic advisor must approve these courses.
Readings & Research:	Students are strongly recommended to take Research in Statistics (BST 698) under various faculty members every semester after completion of the first-year equivalent of course work, until a research advisor is chosen.

PhD Qualifying Exam

Upon completion of the first year-and-a-half of course work, the candidate is given a written examination consisting of two parts - Applied Statistics and Theory of Statistics. The exam will test the students on their understanding and comprehension of the foundation of the theory and applications of statistics, and will generally cover materials from BST 621, 622, 623, 626, 631, 632 and 655. This will be a standard departmental exam, administered by the GPC. The criteria for evaluation are the candidate's understanding and competency in basic principles and foundations of biostatistics, potential for conducting independent research in statistical methods, and ability to express in writing the results of the problems. This examination is offered during the first half of January. At first attempt, a student must take both parts at the same time. For those years during which at least one student needs to take the exam a second time, the exam may be offered in July at the discretion of the GPC. Students must be registered for at least 3 semester hours of graduate work during the semester in which the comprehensive examination is given.

The student may pass each part of the exam at the PhD level, fail at the PhD level but pass at the Master's level, or fail at the Masters level. If a student fails to pass either part of the exam at the PhD level, one additional chance will be given to retake the part of the exam that was failed. A student who fails the qualifying examination more than once will be dismissed from the PhD program. The student has the opportunity to appeal the decision of his/her dismissal. Graduate School policies on dismissal from the program and appeal of dismissal are described in detail in the UAB Student Handbook.

PhD Dissertation Research

After forming a graduate committee, the student should present and prepare a written proposal to their committee for suggestions/approval. The whole committee must approve the proposal, not just the advisor. This is to ensure that the work is novel, feasible, and significant. The word "novel" here is important. A dissertation must add to the body of knowledge in biostatistics, meaning that a careful review of the existing literature on the chosen subject is necessary. It would be very unfortunate to get to the last stages of your work and to have someone suddenly point out to you that it had already been done! During the early stages of the research, it may be useful for the student to register for readings

courses (BST 798) under the direction of the research advisor. The purpose of such courses is to review the literature for the research area of interest in order to help the student formulate a research problem.

After a literature survey and a clearer definition of the scope of the proposed research under the direction of the advisor, the student must submit a written proposal and **present it orally to the dissertation committee**. The dissertation proposal is closed to the general public and should be attended only by the dissertation committee. The committee may approve unconditionally, approve conditionally, or disapprove the proposal. The oral presentation also represents the oral doctoral candidacy exam. As such, a student is expected to demonstrate a good understanding of materials relevant to the general field in which the dissertation is written. The format of the questions for the proposal is left to the discretion of the committee. The outline and the organization of the proposal must follow the graduate school requirements described in the UAB Graduate Student Handbook. The Dissertation Committee and the Graduate Program Director will recommend the student to the Graduate School Dean for admission to candidacy. The committee meeting at which candidacy is discussed must be scheduled through the Graduate School to allow the Dean to attend. If the proposal is not approved, the student may be given only one other opportunity to re-present the proposal and it must be done within six months of the first attempt. You must be registered for at least 3 hours in the semester in which you present your project proposal to your committee.

Once the student has (1) passed the qualifying exam at the doctoral level, (2) written a formal dissertation proposal, and (3) had the dissertation proposal approved by the dissertation committee as an acceptable proposal for research, the committee will recommend to the Dean of the Graduate School that the student be admitted to candidacy. This requires that the student file an “Admission to Candidacy” form with the Graduate School. A student must be in good academic standing to be admitted to candidacy. **Admission to candidacy must take place at least two semesters before the expected completion of the doctoral program.** Students must be admitted to candidacy before they can register for dissertation research hours (BST 799).

PhD Final Exam

After the student has completed all formal requirements for the PhD degree, the dissertation committee administers the final oral examination. The final examination should take the form of a presentation and defense of the dissertation, followed by an examination of the candidate’s comprehensive knowledge of the field. This examination must be scheduled through the Graduate School to allow attendance of the Dean. The defense must be announced at least 2 weeks in advance. It is the responsibility of the student to schedule the defense at a time convenient to all parties involved. **A preliminary copy of the dissertation must be submitted to the dissertation committee for approval at least two weeks prior**

to the defense, unless otherwise approved in advance by the dissertation committee. The meeting must be open to all interested parties, publicized on the UAB campus, published in the UAB Reporter, and must take place at least 30 days before the expected date of graduation. Candidates must be registered for at least 3 semester hours of Dissertation Research (BST 799) during the semester in which the final examination is taken.

The dissertation committee will evaluate the student's performance in the final exam. In order for the student to pass, all of the committee or all but one member of the committee must pass the student in the final exam. Upon approval by the committee and the Graduate Program Director, the result of the final exam should be forwarded to the Graduate School Dean for approval. Final copies of the dissertation after final approval of the committee, including any changes required by the committee, must be submitted to the Dean within two weeks following successful completion of the defense. Please see the Graduate Student Handbook for various deadlines and further details. Upon satisfying all requirements, the dissertation committee and the Graduate Program Director will recommend the student to the Graduate School Dean for the doctoral degree.

Admission

Students in the Graduate program are admitted in the Fall semester of each academic year. Applicants for the MS and PhD programs are expected to have a strong foundation in Mathematics. At the very minimum, they should have had a 3-semester sequence of calculus or equivalent and a semester of advanced matrix algebra. With few exceptions, applicants to the PhD must have a relevant MS degree. The MPH applicants should also be quantitatively oriented with background in calculus and linear algebra.

Application requirements include completion of the online application form, a non-refundable application fee, official transcripts from all undergraduate coursework and all prior graduate coursework, (International transcripts must be submitted to World Education Services (WES) or Educational Credential Evaluators (ECE) for an official course-by-course credential evaluation; document-by-document evaluations will not suffice), three letters of recommendation (submitted online), a statement of purpose, and Graduate Record Examination (GRE) scores. International applicants for whom English is not their first language are also required to submit TOEFL scores. Please note that the department has an ongoing admissions process that begins in February. Thus, it is recommended that prospective students submit completed applications as early as possible (specifically if financial support is desired).

Minimum admission requirements include: a bachelor's degree from an accredited college or university, a score of 156 (146 for MPH) on the verbal and 146 on the quantitative sections of the newly revised GRE exam. GRE exams taken prior to August 1, 2011, a minimum score of 1100 on the combined verbal and

quantitative sections, with a verbal score of at least 550 (400 for MPH) and a quantitative score of at least 550, a score of 3.5 on the analytic section of the GRE test, and an undergraduate grade point average of 3.0 or better (on a 4.0 scale). The department also requires a TOEFL score of at least 250 (600 on the old scale) for all international students whose native language is not English.

Financial Support

Unfortunately, the department is not able to guarantee funding for all students. However, there are many on-campus part-time employment opportunities with ongoing research projects across campus that are available to qualified students with experience in statistical analysis. Within reason, the department will work with all students in order to assist them with finding a funding source for their studies.

Fellowships, Traineeships, and/or Assistantships are awarded to well-qualified students. The financial support of a fellowship or traineeship typically consists of (i) an annual stipend of $22,032 paid over 12 months, and (ii) tuition, fees, and health insurance paid by the department directly to your student account. The financial support of an assistantship typically consists of (i) an annual stipend of $21,000 paid over 12 months, and (ii) $7,000 additional funds to assist with tuition and etc. (paid as additional salary to the student in two installments in August and January, $3,500 each month). The financial support is intended to help full-time students in the graduate program. Accordingly, (i) students must register as a full-time student in approved graduate courses each semester (9 hours fall, 9 hours spring, 3 hours summer) and (ii) students may not engage in any other remunerated activities either on or off campus (exceptions to this rule are rare and require prior approval in writing). In order to continue receiving financial support students must remain in good standing, continue making satisfactory progress towards their degree, and perform their work in a satisfactory manner. Should the faculty responsible for the funding source determine that a student fails to meet any of these criteria, he/she forfeits the award.

A research assistantship requires the student to devote approximately 20 hours per week average effort on research/teaching projects under the supervision of a faculty mentor. Students must be enrolled full-time in order to maintain a research assistantship. This requires the student to take at least 9 credit hours of coursework during the regular semesters and at least 3 credit hours of coursework during the summer. Assistantship appointments are typically for one year at a time.

A student fellowship does not require any work effort, but requires the student to register for a greater number of credit hours each semester. A student on Fellowship is required to take 9 credit hours of coursework during the regular semesters and 6 credit hours during the summer semester.

The department currently has one NIH-funded T32 doctoral training grant. This appointment carries special distinction, is an honor to have, offers certain privileges, and also confer certain obligations.

Trainees are required to pursue their research training on a full-time basis, devoting at least 40 hours per week to the program. This *minimum* of 40 hours includes both classroom studies and their research. All new trainees will receive: 1) "On Being a Scientist" published by the National Academy of Sciences, and 2) a selected list of references on ethical conduct of research. Trainees are expected to review these materials. All trainees must complete and maintain IRB training/certification, complete and maintain IACUC training/certification (if they work with animal studies), complete the Principles of Scientific Integrity course (GRD 717), and complete university diversity training. Trainees are expected to attend all departmental seminars, journal clubs, and grant writing clubs, except when those activities interfere with classes. Trainees are also expected to attend and ideally present their work at one conference each year. Funds are available for this. Additional funds are usually available to allow trainees to attend at least one continuing education workshop outside of UAB each year. The department holds all T32 students to a very high standard. The purpose of the T32 training grants is to train future independent scientists, that is, individuals that can direct their own research programs. Trainees are expected to work actively with a faculty mentor on research projects, with the expectation of co-authoring publications. All trainees must meet with the T32 program directors twice annually (and additionally as requested) in order to review progress.

Additional Information

Deadline for Entry Term(s):	Fall semester
Deadline for All Application Materials to be in the Graduate School Office:	April 1
Number of Evaluation Forms Required:	At least three
Entrance Tests	GRE (TOEFL is required for international applicants whose native language is not English.)

Contact Information

For detailed information, contact:
Dr. Inmaculada Aban
Director, Graduate Program
1665 University Boulevard, RPHB 414
Birmingham, AL 35294-0022.

Telephone/FAX: (205) 934-2732/ (205) 975-2541

E-mail: bstgrad@uab.edu

Web site: www.soph.uab.edu/bst

Course Descriptions

Unless otherwise noted, all courses are of 3 credit hours. Courses in italics are only proposals.

BST 603 – Introductory Biostatistics for Graduate Biomedical Sciences. This course will provide non-biostatistics students seeking a Graduate Biomedical Sciences (GBS) degree with the ability to understand introductory biostatistics concepts. 3 hours. As needed.

BST 611. Intermediate Statistical Analysis I.- Students will gain a thorough understanding of basic analysis methods, elementary concepts, statistical models and applications of probability, commonly used sampling distributions, parametric and non-parametric one and two sample tests, confidence intervals, applications of analysis of two-way contingency table data, simple linear regression, and simple analysis of variance. Students are taught to conduct the relevant analysis using current software such as the Statistical Analysis System (SAS). 3 hours. Fall/Spring.

BST 612. Intermediate Statistical Analysis II.-This course will introduce students to the basic principle of tools of simple and multiple regression. A major goal is to establish a firm foundation in the discipline upon which the applications of statistical and epidemiologic inference will be built. Prerequisite: BST 611 or Permission of Instructor. 3 hours. Spring/Summer.

BST 613. Intermediate Statistical Analysis III. Continuation of concepts in BST 611/612, intended to introduce students to additional general concepts in biostatistics beyond an introductory level. The course will include a broad overview of three areas: 1) categorical, ordinal, and count methods with proportional odds model and Poisson regression; 2) survival analysis and event outcome data with Kaplan-Meier, proportional hazards, and repeated events; 3) repeated measures, mixed models, hierarchical modeling for longitudinal and missing data. Study design, analysis, interpretation of results, power and sample size estimation, and non-parametric alternatives will be presented for all topic areas. Prerequisite: BST 612. 3 hours. Fall.

BST 619. Data Collection and Management. Basic concepts of study design, forms design, quality control, data entry, data management and data analysis. Hands-on experience with data entry systems (e.g., DBASE) and data analysis software (e.g., SAS). Exposure to other software packages as time permits. Prerequisites: BST 611; Previous computer experience or workshop on microcomputers highly recommended. 3 hours. Spring.

BST 620. Applied Matrix Analysis.-Vector and matrix definitions and fundamental concepts; matrix factorization and application. Eigenvalues and eigenvectors, functions of matrices, singular and ill-conditioned problems. Prerequisite: BST 622. 3 hours. As needed.

BST 621. Statistical Methods I. Mathematically rigorous coverage of applications of statistical techniques designed for biostatistics majors and others with sufficient mathematical background. Statistical models and applications of probability; commonly used sampling distributions; parametric and nonparametric one and two sample tests and confidence intervals; analysis of contingency tables; simple linear regression and analysis of variance. Prerequisites: A year of calculus and linear algebra. 3 hours. Fall.

BST 622. Statistical Methods II. Continuation of concepts in BST 621, extended to multiple linear regression; analysis of variance; analysis of covariance; multiple analysis of variance; use of contrasts and multiple comparisons procedures; simple and multiple logistic regression; introduction to survival analysis. Prerequisites: BST 621. 3 hours. Spring.

BST 623. General Linear Models. Simple and multiple regression using matrix approach; weighted and nonlinear regression; variable selection methods; modeling techniques; regression diagnostics and model validation; systems of linear equations; factorial designs; blocking; an introduction to repeated measures designs; coding schemes. Prerequisite: BST 622. 3 hours. Fall.

BST 624. Experimental Design. Intermediate experimental design and analysis of variance models using Matrix approach. Factorial and nested (hierarchical) designs; blocking; repeated measures designs; Latin squares; incomplete block designs; fractional factorials; confounding. Prerequisites: Matrix algebra and BST 623. 3 hours. As needed.

BST 625. Design and Conduct of Clinical Trials. Concepts of clinical trials; purpose, design, implementation and evaluation. Examples and controversies presented. Prerequisites: BST 611 and 612 or permission of the instructor. 3 hours. Pass/No Pass. Summer.

BST 626/626L. Data Management/Reporting with SAS. A hands-on exposure to data management and report generation with one of the most popular statistical software packages. Concurrent registration in BST 626 and BST 626L is required. 3 hours. Fall.

BST 631. Statistical Theory I. Fundamentals of probability; conditional probability and independence; distribution, density, and mass functions; random variables; moments and moment generating functions; discrete and continuous distributions; exponential families, joint, marginal, and conditional distributions;

transformation and change of variables; convergence concepts; sampling distributions; order statistics; random number generation. Prerequisites: Advanced calculus. 4 hours. Fall.

BST 632. Statistical Theory II. Point interval estimation; sufficiency and completeness; ancillary statistics; maximum likelihood and moment estimators; best unbiased estimator; hypothesis and significance testing; likelihood ratio tests and uniformly most powerful tests; confidence interval estimation; asymptotic properties of estimators and tests; introduction to Bayesian inference. Prerequisite: BST 631. 4 hours. Spring.

BST 640. Nonparametric Methods. Properties of statistical tests; order statistics and theory of extremes; median tests; goodness of fit; tests based on ranks; location and scale parameter estimation; confidence intervals; association analysis; power and efficiency. Prerequisite: BST 622, BST 632. 3 hours. As needed.

BST 655. Categorical Data Analysis – Intermediate level course with emphasis on understanding the discrete probability distributions and the correct application of methods to analyze data generated by discrete probability distributions. The course covers contingency tables, Mantel-Haenszel test, measures of association and of agreement, logistic regression models, regression diagnostics, proportional odds, ordinal and polytomous logistic regression, Poisson regression, log linear models, analysis of matched pairs, and repeated categorical data. Prerequisite: BST 622 or equivalent recommended. 3 hours. Fall.

BST 660. Applied Multivariate Analysis. Analysis and interpretation of multivariate general linear models including multivariate regression, multivariate analysis of variance/covariance, discriminant analysis, repeated measures, canonical correlation, and longitudinal data analysis for general and generalized linear models. Extensive use of SAS, SPSS, and other statistical software. Prerequisite: BST 623. 3 hours. As needed.

BST 661. Structural Equation Modeling. Basic principles of measurements; factor analysis and latent variable models; multivariate predictive models including mediation mechanisms and moderator effects; path analysis; integrative multivariate covariance models, methods of longitudinal analysis. Prerequisite: BST 623. 3 hours. As needed.

BST 665. Survival Analysis. Kaplan-Meier estimation; Parametric survival models; Cox proportional hazards regression models; Sample size calculation for survival models; Competing risks models; multiple events models. Prerequisite: BST 622. 3 hours.

BST 670. Sampling Methods. Simple random, stratified, cluster, ratio regression and systematic sampling; sampling with equal or unequal probabilities of selection; optimization; properties of estimators;

non-sampling errors; sampling schemes used in population research; methods of implementation and analyses associated with various schemes. Prerequisite: BST 631. 3 hours. As needed.

BST 671. Meta Analysis. Statistical methods and inference through meta analysis. Prerequisite: BST 623, BST 632. 3 hours. As needed.

BST 675. Introduction to Statistical Genetics. This class will introduce students to population genetics, genetic epidemiology, microarray and proteomics analysis, Mendelian laws, inheritance, heritability, test cross linkage analysis, QTL analysis, human linkage and human association methods for discrete and quantitative traits. Prerequisite: BST 611 or BST 621. 3 hours. Spring.

BST 676. Statistical Bioinformatics. The purpose of this class will be to teach graduate students statistics methods that underlie the analysis of data generated by high throughput genomic technologies, as well as issues in the experimental design and implementation of these technologies. High throughput technologies that will be covered include microarrays, proteomics, and second generation sequencing. Prerequisites: BST 611 or 621. BST 675 recommended. 3 hours. Spring (odd years).

BST 691 – Biostatistics Pre-doctoral Seminar Series. This course provides an opportunity for students to learn about ongoing research in the field of biostatistics, clinical trials, and statistical genetics. Pass/No Pass. 1 hour. Fall/Spring.

BST 695. Special Topics. This course is designed to cover special topics in Biostatistics that are not covered in regular 600 level courses, but suited for Masters students in Biostatistics and doctoral students in other related disciplines. 1-3 hours.

BST 697. Internship in Biostatistics. Pass/No Pass. 1-6 hours.

BST 698. Non-thesis Research. Pass/No Pass. 1-6 hours.

BST 699. Master's Thesis Research. Prerequisite: Admission to candidacy for MS Degree. Pass/No Pass. 1-12 hours.

BST 723. Theory of Linear Models. Multivariate normal distributions and quadratic forms; least square estimation; nested models; weighted least squares; testing contrasts; multiple comparisons; polynomial regression; maximum likelihood theory of log-linear models. Prerequisite: BST 632. 3 hours. Fall (odd years).

BST 725. Advanced Clinical Trials I. This course will provide students with a basic understanding of the fundamental statistical principles involved in the design and conduct of clinical trials. Important topics of

discussion will include data management, quality assurance, endpoints, power analysis, interim analysis, adaptive designs, and genetic issues in clinical trials. Prerequisites: BST 611, 612 and 625. 3 hours. Fall (even years).

BST 726. Advanced Clinical Trials II. This course builds on the knowledge gained in BST 725 in order to develop a more thorough understanding of the basic methodology behind power analysis, interim data monitoring, analysis of missing data, and adaptive designs. The class involves discussions of recent publications dealing with current topics of interest in clinical trials. Each student must conduct, summarize, and present a course project based on a more in-depth exploration of one of the topics introduced in the BST 725 course. Prerequisites: BST 621, 622, 625, 631, 632 and 725. 3 hours. Spring (odd years).

BST 735. Advanced Inference. Stochastic convergence and fundamental inequalities; weak convergence and the central limit theorems; large sample behavior of the empirical distribution and order statistics; Asymptotic behavior of estimators and tests with particular attention to LR, score and Wald tests. Prerequisites: BST 631 and 632. 3 hours. Spring (odd years).

BST 740. Bayesian Analysis. To introduce the student to the basic principles and tools of Bayesian Statistics and most importantly to Bayesian data analysis techniques. A major goal is to establish a firm foundation in the discipline upon which the applications of statistical and epidemiologic inference will be built. The practical part of the course will be based on Bugs (either WinBugs or OpenBugs), possibly accessed through R with the existing tools for the interface (R packages: R2WinBUGS or BRugs, coda). This will enable participants to take the practical examples all the way to the reporting stage in terms of tabulations and graphics. Prerequisites: BST 632. 3 hours. Fall (even years).

BST 741. Advanced Bayesian Analysis II. To illustrate advanced approaches to Bayesian modeling and computation in statistics. We begin with a brief description of the basic principle and concepts of Bayesian statistics. We then study advanced tools in Bayesian modeling and computation. A variety of models are covered, including multilevel/hierarchical linear and generalized linear models, models for robust inference, mixture models, multivariate models, nonlinear models, missing data, and Bayesian model selection. We also introduce some applied areas of modern Bayesian methods, such as genetics/genomics and clinical trials. The practical part of the course will be based on Bugs (either WinBugs or OpenBugs), possibly accessed through R with the existing tools for the interface (R packages: R2WinBUGS or BRugs, coda). This will enable participants to take the practical examples all the way to the reporting stage in terms of tabulations, graphics etc. Prerequisites: BST 631 and 632. BST740 would be helpful but not absolutely required. Fall (odd years).

BST 750. Stochastic Modeling. Poisson processes; random walks; simple diffusion and branching processes; recurrent events; Markov chains in discrete and continuous time; birth and death process; queuing systems; applications to survival and other biomedical models. Prerequisite: BST 632. 3 hours. As needed.

BST 760. Generalized Linear and Mixed Models. Generalized linear models; mixed models; and generalized estimating equations. Prerequisite: BST 723. 3 hours. Spring (even years).

BST 765. Advanced Computational Methods.-Numerical algorithms useful in biostatistics including likelihood maximization using the Newton-Raphson method, EM algorithm, numerical integration using quadratic and Monte-Carlo methods, interpolation using splines, random variate generation methods, data augmentation algorithm, MCMC and Metropolis-Hastings algorithm; randomization tests; resampling plans including bootstrap and jackknife. Prerequisites: BST 632. 3 hours. Fall (even years).

BST 775. Statistical Methods for Genetic Analysis I. - This course will provide a statistical basis for describing variation in qualitative (disease) and quantitative traits. This will include decomposition of trait variation into components representing genes, environment and gene-environment interaction. Resemblance between relatives and heritability will be described. Important topics of discussion will include oligogenic and polygenic traits, complex segregations analysis, methods of mapping and characterizing simple and complex trait loci. Prerequisites: BST 623, BST 632, and BST 675. It is assumed that students are comfortable with regression theory, covariance, correlation, and likelihood theory. Interested students are urged to contact the instructors with concerns regarding assumed knowledge. 3 hours. Fall (odd years).

BST 776. Statistical Methods for Genetic Analysis II.- This course builds on the knowledge gained in BST 775 with rigorous mathematical and statistical treatment of methods for localizing genes and environmental effects involved in the etiology of complex traits using case-control and pedigree data. Prerequisites: BST 775; Knowledge of SAS and programming languages such as C++, and basic knowledge of multivariate methods and Markov chain theory is highly recommended. 3 hours. Spring (even years).

BST 793 – Biostatistics Post-doctoral Seminar Series. This course provides an opportunity for post-doctoral students to learn about ongoing research in the field of biostatistics, clinical trials, and statistical genetics. Pass/No Pass. 3 hours. Fall/Spring.

BST 795. Advanced Special Topics. This course is designed to cover advanced special topics in Biostatistics not covered in regular 700 level courses, but suited for doctoral students in Biostatistics. Prerequisites: BST 622 & 632. 1-3 hours.

BST 798. Non-dissertation Research. Pass/No Pass. 1-6 hours.

BST 799. Doctoral Dissertation Research. Prerequisite: Admission to candidacy for PhD. Pass/No Pass. 1-12 hours.

Environmental Health Sciences (Ph.D., M.P.H., M.S.P.H.)

Degree Offered:	Ph.D., M.P.H., M.S.P.H.
Director:	*Dale A. Dickinson, Ph.D.*
Phone:	205-975-7493
E-mail:	dadickin@uab.edu
Web site:	http://www.soph.uab.edu/ehs

Faculty

Dale A. Dickinson, Ph.D., Assistant Professor and Graduate Program Director - Molecular mechanisms of the adaptive response to environmental toxicants and pollutants; mechanism of action of naturally occurring compounds; induction of glutathione; functional genomics & proteomics of naturally occurring compounds.

Michelle V. Fanucchi, Ph.D., Associate Professor and Chair - Childhood lung disease and its etiology. Pulmonary cell biology and toxicology of air pollutants, including particulates, ozone, chlorine and various polyaromatic hydrocarbons. Cell-to-cell interactions in the developing lung as well as in repair after lung injury and disease in children.

Julia M. Gohlke, Ph.D., Assistant Professor - Main focus of research is development of methods to improve assessments of health threats, both nationally and globally, through application of novel bioinformatics and computational modeling approaches. Particular areas of interest include improving methods for incorporation of neurodevelopmental processes that distinguish children as a vulnerable population, health implications of energy policy and climate change, and environmental policy evaluation from a global health perspective.

Rui-Ming Liu, Ph.D., DABT, Associate Professor - With continuous improvement in the technology and living conditions, human lifespan is expected to increase and consequently, a greater percentage of the population will consist of older individuals. Therefore, to improve the health of the elderly has become an urgent task for the public health professionals. The research in my lab mainly focuses on the etiology, pathogenesis, and potential therapeutic intervention of Idiopathic Pulmonary Fibrosis (IPF) and Alzheimer's disease, two aging-related diseases with no known etiology and no effective treatment. We are interested in redox regulation of plasminogen activator inhibitor 1 (PAI-1) expression during aging and the role of increased PAI-1 expression in the pathogenesis of these aging-related diseases**.**

Claudiu T. Lungu, Ph.D., Associate Professor and Interim Director, Deep South Center for Occupational Health and Safety - Evaluation of adsorption characteristics of granular activated carbon and activated carbon fibers used in respiratory protection and protective clothing; Measurement and evaluation of VOC exposure in various workplaces; VOC emissions from building materials; Exposure to ionizing radiation.

Elizabeth H. Maples, Ph.D., M.P.H., Assistant Professor and Deputy Director, Deep South Center for Occupational Health and Safety - Reduction of work-related injuries and illnesses through effective training programs, designing, implementing and evaluating occupational health and safety training programs. Also interested in expanding the capacity of environmental public health practitioners in working within communities to address environmental health problems, specifically noise pollution.

Edward M. Postlethwait, Ph.D., Professor - Research and academic interests are founded in pulmonary toxicology and free radical biochemistry, with current efforts primarily focused on delineating the mechanisms by which inhaled oxidants interact with the lung surface to initiate epithelial injury, how environmental oxidants impact lung growth and development, and what factors may govern the extent and distribution of exposure-related cellular perturbations. To address these issues, research endeavors incorporate aspects of physiology, quantitative morphology and image analysis, oxidant and antioxidant biochemistry, pharmacokinetics, dosimetry, and chemical engineering.

Giuseppe L. Squadrito, Ph.D., Research Associate Professor - Development, design and evaluation of dynamic multi-component molecular systems that can be used to understand the effects of oxidants in biological systems of various degrees of complexity. Such systems include reactions of smog, combustion-associated, and naturally produced oxidants and free radicals with biological target molecules, the covalent modifications that they induce and the cellular responses that ensue, and the protection by natural and synthetic antioxidants, antioxidant enzymes, and free radical scavengers.

Program Information and Objectives

The Department of Environmental Health Sciences focuses on understanding the causes, mechanisms, and consequences of environmental and occupational hazards, as well as the prevention and management of these hazards. Principal research areas include: Environmental Toxicology, Free Radical Biology, Cell Signaling, Exposure Assessment, Environmental Management and Environmental Disasters.

Graduate degree programs in Environmental Health Sciences prepare students for basic and applied scientific careers in academic, industry, government, and non-governmental organizations. In recent years, graduates from the department have been employed by federal agencies (e.g., the U.S. Environmental Protection Agency, the Centers for Disease Control and Prevention, NIOSH, the U.S. Public Health Service, ATSDR, department of Veterans Affairs), the armed forces, local and state health departments (e.g., Alabama Department of Public Health, Florida State Department of Health, Jefferson County Department of Health, Kentucky State Health Department), hospitals (e.g., Children's Hospital), major research laboratories (e.g., Oak Ridge National Lab, Southern Research Institute), business and industry (e.g., , Alcoa, Arco, Bayer, Booz Allen, Eli Lilly, GE, Honda, Honeywell, Lockheed Martin, Mercedes Benz, Proctor and Gamble, Roy F. Weston , and a variety of well-know academic institutions (e.g., Vanderbilt, University of California).

UAB is a highly innovative major research university with five schools ranked in the top 20 in NIH funding and an overall level of research funding totaling more than $400 million. The university also hosts over 70 research centers providing rich opportunities for cross-disciplinary collaborations. Students will have the opportunity to interact and conduct dissertation research in university-wide translational research endeavors. Basic science students will participate in the Graduate Biomedical Sciences (GBS) program during their first year of study. The GBS program is an innovative multidisciplinary program that integrates the principles of biochemistry, molecular biology, physiology, pathophysiology, and toxicology in the context of human health and disease. More than 150 UAB faculty members are affiliated with the GBS program, providing students with the opportunity to grow academically and professionally with a diverse network of faculty. More information on the GBS program can be found at: http://www.uab.edu/gbs/

Admission

Applicants should have a bachelor's or higher degree in one of the natural sciences, medical sciences, or engineering fields from an accredited college or university. Regardless of degree, this should include courses in biology; general, organic, and physical chemistry; physics; and mathematics though calculus. Applicants interested in a specializing in Environmental Toxicology are encouraged to have completed

courses in biochemistry and physiology. Industrial Hygiene applicants are expected to have completed Industrial Hygiene courses in an accredited Industrial Hygiene Masters program or the equivalent, or have significant experience in the practice of Industrial Hygiene. Applicants who do not have adequate preparation in these areas are expected to complete remedial training as part of their didactic requirements. Applicants are required to have a GPA of at least 3.0 and to take the GRE General Test. A score of at least 146 on the quantitative section and 156 on the verbal section is required; consideration will also be given to performance on the analytical section. Deadline for applications to be admitted into the program is April 1, although basic science applicants are encouraged to apply no later than February 1.

Degree Options

The Department offers training in three broad areas: **(1) Basic Science of Environmental Toxicology, (2) Industrial Hygiene/Occupational Safety,** and **(3) Environmental Management and Policy.** A combination of didactic, laboratory, and/or field-based training are provided to achieve the specific goals for each student.

At the doctoral level, three foci are offered:

- Environmental Health Sciences Research
- Industrial Hygiene
- Environmental Management and Policy

At the masters level, six programs of study are offered:

- MPH in Environmental Health/Toxicology
- MPH in Occupational Health and Safety
- MPH in Industrial Hygiene
- MPH in the Accelerated Program in Industrial Hygiene
- MSPH in Environmental Health Toxicology
- MSPH in Industrial Hygiene

MPH in Environmental Health & Toxicology

The MPH in Environmental Health / Toxicology studies the links between the environment and public health, studying all aspects of this process from initial exposure to toxicant action to science-based policy development. We train students to recognize and assess exposures, determine the toxicity risk to the public, and design and properly communicate strategies to reduce risk and help set appropriate policy.

Environmental Health Curriculum: Students pursuing the Environmental Health & Toxicology degree track must complete a total of 42 credit hours including the MPH core courses listed below.

Coursework		Credit Hours
MPH Core		19
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
ENH 611	Environmental & Occupational Exposure Assessment	3
EPI 600	Introduction to Epidemiology	3
HB 600	Social and Behavioral Science Core	3
HCO 600	Introduction to Public Health Systems and Population-Based Health Programs	3
PUH 695	The Public Health Integrative Experience	1
Departmental Track Requirements		11
ENH 612	Environmental Management	3
ENH 650	Essentials of Environmental and Occupational Toxicology and Diseases	3
ENH 660	Fundamentals of Air and Water Pollution	3
ENH 691	Current Topics in Environmental Occupational Health & Safety	1
ENH 691	Current Topics in Environmental Occupational Health & Safety	1
Departmental Electives		6*
School Wide Requirements		3
GRD 727	GRD Writing class or as determined by UAB Graduate School	3
Internship		3
ENH 697	Internship	3
		Total 42

* The department highly recommends ENH 661 (2 credit hours)

(Online) MPH in Environmental Health & Toxicology

The MPH in Environmental Health / Toxicology studies the links between the environment and public health, studying all aspects of this process from initial exposure to toxicant action to science-based policy development. We train students to recognize and assess exposures, determine the toxicity risk to the public, and design and properly communicate strategies to reduce risk and help set appropriate policy.

Environmental Health Curriculum: Students pursuing the Environmental Health & Toxicology degree track must complete a total of 42 credit hours including the MPH core courses listed below.

Coursework	Credit Hours

MPH Core		19
BST 611Q	Intermediate Statistical Analysis I	3
BST 612Q	Intermediate Statistical Analysis II	3
ENH 611Q	Environmental & Occupational Exposure Assessment	3
EPI 600Q	Introduction to Epidemiology	3
HB 600Q	Social and Behavioral Science Core	3
HCO 600Q	Introduction to Public Health Systems and Population-Based Health Programs	3
PUH 695Q	The Public Health Integrative Experience	1
Departmental Track Requirements		11
ENH 612Q	Environmental Management	3
ENH 650Q	Essentials of Environmental and Occupational Toxicology and Diseases	3
ENH 660Q	Fundamentals of Air and Water Pollution	3
ENH 691Q	Current Topics in Environmental Occupational Health & Safety	1
ENH 691Q	Current Topics in Environmental Occupational Health & Safety	1
Departmental Electives		6*
School Wide Requirements		3
GRD 727Q	GRD Writing class or as determined by UAB Graduate School	3
Internship		3
ENH 697	Internship	3
		Total 42

* The department highly recommends ENH 661Q (2 credit hours)

MPH in Occupational Health and Safety

Health related careers are in high demand. We are searching for occupational health and safety professionals of tomorrow – bright, inquisitive students – with a desire to make a difference in the lives of others! You can make a difference in the lives of workers in your community. Our graduates are at the frontline to protect workers from injuries and illnesses. A safer, healthier workforce is a good thing for everyone. Graduates of our academic programs find rewarding and challenging careers in various employment sectors - working as team members to protect our nation's most valuable asset, **PEOPLE!**

Occupational Health and Safety Curriculum: Students pursuing the **Occupational Health and Safety** degree track must complete a total of 44-45 credit hours including the MPH core courses listed below.

Coursework		**Credit Hours**
MPH Core		**19**
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
ENH 611	Environmental & Occupational Exposure Assessment	3
EPI 600	Introduction to Epidemiology	3
HB 600	Social and Behavioral Science Core	3
HCO 600	Introduction to Public Health Systems and Population-Based Public Health Programs	3
PUH 695	The Public Health Integrative Experience	1

Departmental Track Requirements		**17**
ENH 612	Assessing & Managing Environmental Risks	3
ENH 621	Fundamentals of Industrial Hygiene	3
ENH 650	Essentials of Environmental and Occupational Toxicology and Disease	3
ENH 670	Fundamentals of Occupational Safety	3
ENH 680	Field Interdisciplinary Studies	1
ENH 681	Interdisciplinary Worksite Evaluations	2
ENH 691	Current Topics in Environmental Occupational Health & Safety	1
ENH 691	Current Topics in Environmental Occupational Health & Safety	1
Departmental Electives		**2-3***
School Wide Requirements		**3**
GRD 727	GRD writing (or as recommended by Graduate School)	3
Internship		**3**
ENH 697	Internship	3
		Total 44-45

* The department highly recommends ENH 661 (2 credit hours)

(Online) MPH in Occupational Health and Safety

Designed for working professionals who have a passion for making a difference, our on-line degree program lets you earn your degree while you continue in your career. Your learning experience will be enriched by your experiences in the real world as you and your classmates focus on the identification and assessment of human health threats and the prevention of injury and disease related to occupational and environmental agents.

Occupational Health and Safety Curriculum: Students pursuing the **Occupational Health and Safety** degree track must complete a total of 44-45 credit hours including the MPH core courses listed below.

Coursework		**Credit Hours**
MPH Core		**19**
BST 611Q	Intermediate Statistical Analysis I	3
BST 612Q	Intermediate Statistical Analysis II	3
ENH 611Q	Environmental & Occupational Exposure Assessment	3
EPI 600Q	Introduction to Epidemiology	3
HB 600Q	Social and Behavioral Science Core	3
HCO 600Q	Introduction to Public Health Systems and Population-Based Public Health Programs	3
PUH 695Q	The Public Health Integrative Experience	1
Departmental Track Requirements		**17**
ENH 612Q	Assessing & Managing Environmental Risks	3
ENH 621Q	Fundamentals of Industrial Hygiene	3
ENH 650Q	Essentials of Environmental and Occupational Toxicology and Disease	3

ENH 670Q	Fundamentals of Occupational Safety	3
ENH 680Q	Field Interdisciplinary Studies	1
ENH 681Q	Interdisciplinary Worksite Evaluations	2
ENH 691Q	Current Topics in Environmental Occupational Health & Safety	1
ENH 691Q	Current Topics in Environmental Occupational Health & Safety	1
Departmental Electives		**2-3***
School Wide Requirements		**3**
GRD 727Q	GRD writing (or as recommended by Graduate School)	3
Internship		**3**
ENH 697	Internship	3
		Total 44-45

* The department highly recommends ENH 661Q (2 credit hours)

MPH in Industrial Hygiene

This track is designed to provide an intensive educational experience for students without previous experience but who have a strong commitment to occupational health and safety and hazardous substances. Calculus, although not required, is highly recommended. In addition to didactic coursework, these tracks require a three-month internship which is arranged by the program.

The MPH in industrial hygiene combines didactic research instruction and applied research experience for students with or without previous work experience. The industrial hygiene program is designed to develop the students' understanding of the interrelationships between the basic sciences and the causes and prevention of occupational related diseases. Graduates of the program will be capable of developing systematic approaches to identifying and controlling problems in industrial hygiene, designing and implementing research programs to measure the level of work exposure to hazardous agents, and instituting necessary control measures.

The industrial hygiene program is a component of the Deep South Center for Occupational Health and Safety, one of 16 Education and Research Centers partially supported by the National Institute for Occupational Safety and Health (NIOSH).

Curriculum for Industrial Hygiene: Students must complete the basic MPH core (19 credit hours) and an additional 40 credit hours of course work. Included in the curriculum is a three-month internship in which principles learned in the classroom are put into practice. These are generally paid positions in industry. More than 60 industries nationwide have participated in this program.

Coursework		**Credit Hours**
MPH Core		**19**
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
ENH 611	Environmental & Occupational Exposure Assessment	3

EPI 600	Introduction to Epidemiology	3
HB 600	Social and Behavioral Science Core	3
HCO 600	Introduction to Public Health Systems and Population-Based Health Programs	3
PUH 695	The Public Health Integrative Experience	1
Departmental Track Requirements		**28**
ENH 612	Assessing & Managing Environmental Risks	3
ENH 621	Fundamentals of Industrial Hygiene	3
ENH 624	Control of Occupational Hygiene	2
ENH 625	Industrial Hygiene Case Studies	2
ENH 626	Physical Agents	2
ENH 650	Environmental and Occupational Toxicology and Diseases	3
ENH 661	Air Sampling and Analysis	2
ENH 670	Fundamentals of Occupational Safety	3
ENH 680	Field Interdisciplinary Studies	2
ENH 681	Interdisciplinary Work Site Evaluations	2
ENH 681	Interdisciplinary Work Site Evaluations	2
ENH 691	Current Topics in Environmental Occupational Health and Safety	1
ENH 691	Current Topics in Environmental Occupational Health and Safety	1
Departmental Research		**3**
ENH 699	Master's Level Project Research	3
Departmental Electives		**3**
School Wide Requirements		**3**
GRD 727	Writing (or course determined by Graduate School)	3
Internship		**3**
ENH 697	Internship	3
		Total 59

MPH in Accelerated Program in Industrial Hygiene

This track is designed specifically for and limited to graduates of undergraduate Industrial Hygiene programs financially supported by the National Institute for Occupational Safety and Health (NIOSH). Graduates of these programs have received basic courses from NIOSH, peer-reviewed and approved Industrial Hygiene curricula, and are qualified to practice Industrial Hygiene. The Accelerated Program in

Industrial Hygiene will broaden the student's public health knowledge and skills while also preparing students to take leadership roles in Industrial Hygiene.

Admission: Students who have graduated from a NIOSH funded and ABET accredited undergraduate Industrial Hygiene program and who meet the minimum requirements for admission to the School of Public Health. ABET is the Applied Science Accreditation Commission of the Accreditation Board of Engineering and Technology. Students without previous experience, but who have a strong commitment to occupational health and safety, may be admitted. In addition to the general admissions requirements for the School of Public Health enrollees shall hold a baccalaureate degree based on a minimum of 120 semester hours or the equivalent that shall include 63 or more semester-hour credits in undergraduate or graduate-level courses in science, mathematics, engineering, and technology, with at least 15 of those at the upper (junior, senior, or graduate) level and a minimum of 21 semester-hour credits, or the equivalent, in communications, humanities and social sciences. Remedial courses, designed to remove deficiencies in the background of entering students, are inherently at a level lower than expected in college credit work. Such courses, particularly in the areas of mathematics, basic science, and communications, cannot be used to meet the minimums in curricular content requirements.

Curriculum: Students must complete the MPH Core (19 credit hours) and an additional 28 credit hours for a total of 47 credit hours. Included in the curriculum is a 3 credit hour (three-month, summer semester) internship and a 3 credit hour thesis/project requirement. The internships are generally paid positions in industry or government. Flexibility is offered in the research experience to allow highly motivated students to graduate after 12 months of study

Coursework		**Credit Hours**
MPH Core		**19**
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
ENH 611	Environmental & Occupational Exposure Assessment	3
EPI 600	Introduction to Epidemiology	3
HB 600	Social and Behavioral Science Core	3
HCO 600	Introduction to Public Health Systems and Population-Based Health Programs	3
PUH 695	The Public Health Integrative Experience	1
Departmental Track Requirements		**13**
ENH 612	Assessing & Managing Environmental Risks	3
ENH 625	Industrial Hygiene Case Studies	2
ENH 650	Environmental and Occupational Toxicology and Diseases	3
ENH 680	Field Interdisciplinary Studies	1
ENH 681	Interdisciplinary Worksite Evaluations	2
ENH 691	Current Topics in ENH Occupational Health & Safety	1
ENH 691	Current Topics in ENH Occupational Health & Safety	1
Departmental Research		**3**
ENH 699: Masters Level Project Research		3
Departmental Electives		**6**
School Wide Requirements		**3**
GRD 727	GRD writing (or course determined by Grad School)	3
Internship		**3**

ENH 697	Internship	3

Total 47

MSPH in Environmental Health Toxicology

The MSPH program in Environmental Health Sciences/Toxicology is designed to provide an intensive educational experience for those with or without previous experience. Environmental health professionals must be able to recognize, evaluate, and control environmental situations that may lead to disease. They may also require knowledge in designing and conducting studies of environmental chemicals to assess the probability that environmental toxic agents present a risk to humans and/or the environment and to define safe limits of human exposure to them.

MSPH Degree Program Learning Objectives
The objectives of the MSPH program are to assure that students will:

- describe the distribution of chemical, physical, and biological agents in the environment and in the occupational environment;
- apply quantitative methods to measure the concentration or intensity of these agents;
- identify and describe the diseases or other adverse health effects that may result from exposure to these agents and the risk of those outcomes;
- explain and control interventions to reduce or eliminate exposures to these agents;
- recognize regulatory and management considerations relative to these agents;
- critically evaluate published scientific reports; and
- design a sound methodological study to test a new hypothesis, conduct the study, analyze the resulting data and prepare a report of the study.

Admission: Students without previous experience, but who have a strong commitment to environmental health science may be admitted.

Curriculum: Students must complete a total of 40 credit hours. Electives are chosen in consultation with the student's advisor and should be selected to fit the student's interests, career goals, and academic needs. The degree can be obtained in 21 months of full-time study.

Coursework		**Credit Hours**
MSPH Core		**13**
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
ENH 611	Environmental & Occupational Exposure Assessment	3
EPI 610	Principles of Epidemiologic Research (EPI 610L concurrent lab required)	4
Departmental Track Requirements		**6**
ENH 612	Assessing & Managing Environmental Risks	3
ENH 650	Environmental & Occupational Toxicology & Diseases	3
Departmental Elective		**3**
Masters Level Research		**13**
ENH 699	Masters Level Project Research	3
ENH 699	Masters Level Project Research	3
ENH 699	Masters Level Project Research	3
ENH 699	Masters Level Project Research	4

Seminar/Journal Club		**5**
ENH 691	Current Topics in Environmental & Occupational Health & Safety	1
ENH 691	Current Topics in Environmental & Occupational Health & Safety	1
ENH 691	Current Topics in Environmental & Occupational Health & Safety	1
ENH 790	Current Topics in Environmental Health Sciences Research	1
ENH 790	Current Topics in Environmental Health Sciences Research	1
		Total 40

MSPH in Industrial Hygiene

The Master of Science in Public Health (MSPH) curriculum with a concentration in Industrial Hygiene will provide students with an option for a more concentrated focus on industrial hygiene topics and a more intensive research experience.

MSPH Degree Program Learning Objectives

The objectives of this degree option are to:

- describe the distribution of chemical, physical, and biological agents in the occupational environment;
- apply quantitative methods to measure the concentration or intensity of these agents;
- identify and describe the diseases or other adverse health effects that may result from exposure to these agents and the risk of those outcomes;
- explain and control interventions to reduce or eliminate exposures to these agents;
- recognize regulatory and management considerations relative to these agents;
- critically evaluate published scientific reports;;and
- design a sound methodological study to test a new hypothesis, conduct the study, analyze the resulting data and prepare a report of the study.

The research aspect of this curriculum is conducted under the requirements of the UAB Graduate School, and includes: formation of a research committee, defense of a research proposal, conduct of the research, preparation of a formal thesis, and presentation and defense of the thesis.

Admission: Students without previous experience, but who have a strong commitment to Industrial Hygiene, may be admitted. In addition to the general admissions requirements for the School of Public Health enrollees should have a strong background in math and science and a strong commitment to conduct research (laboratory or field based) as the MS level.

Curriculum: Students must complete a total of 56 credit hours. Electives are chosen in consultation with the student's advisor and should be selected to fit the student's interests, career goals, and academic needs. The degree can be obtained in 21 months of full-time study.

Coursework		**Credit Hours**
MSPH Core		**13**
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
ENH 611	Environmental & Occupational Exposure Assessment	3
EPI 610	Principles of Epidemiologic Research (EPI 610L concurrent lab required)	4

Departmental Track Requirements		**26**
ENH 612	Assessing & Managing Environmental Risks	3
ENH 621	Fundamentals of Industrial Hygiene	3
ENH 624	Control of Occupational Hazards	2
ENH 625	Industrial Hygiene Case Studies	2
ENH 626	Physical Agents	2
ENH 650	Environmental & Occupational Toxicology & Diseases	3
ENH 661	Environmental Sampling and Analysis	2
ENH 670	Fundamentals of Occupational Safety & Ergonomics	3
ENH 680	Field Interdisciplinary Studies	1
ENH 680	Field Interdisciplinary Studies	1
ENH 681	Interdisciplinary Worksite Evaluations	2
ENH 681	Interdisciplinary Worksite Evaluations	2
Masters Level Research		**10**
ENH 699	Masters Level Project Research	5
ENH 699	Masters Level Project Research	5
Seminar/Journal Club		**4**
ENH 691	Current Topics in Environmental & Occupational Health & Safety	1
ENH 691	Current Topics in Environmental & Occupational Health & Safety	1
ENH 691	Current Topics in Environmental & Occupational Health & Safety	1
ENH 790	Current Topics in Environmental Health Sciences Research	1
Internship		**3**
ENH 697	Internship	3
		Total 56

PhD in Environmental Health Sciences

The PhD program in Environmental Health Sciences prepares scientists for careers in research, environmental program management, and policy analysis. Education and research in the identification, evaluation, and control of hazards to human health are emphasized in this program. Students may concentrate on a wide variety of areas including exposure assessment, environmental chemistry, non-point source water pollution, risk assessment and management, environmental toxicology, and industrial hygiene. Graduates are qualified to assume upper-level positions in the public or private sector in management, teaching, research, or consulting. Graduates are particularly qualified for teaching or research positions in academic institutions that require sound research training.

PhD Learning Objectives

The PhD in the Department of Environmental Health Sciences is an academic research degree. In addition to understanding the advanced concepts of environmental health sciences, as they are related to environmental health, industrial hygiene, or environmental toxicology, graduates of this program are expected to develop skills that will enable them to identify and define questions of environmental health

importance, design research studies to address these questions, and to complete a program of research that demonstrates abilities as an independent investigator.

The general learning objectives of the PhD will allow students to:

- critically analyze the environmental health literature, identify environmental health problems, and formulate research hypotheses to address these problems;
- design original research for the evaluation of hypotheses;
- conduct all aspects of the proposed research in a manner that will provide accurate data and prepare a comprehensive report of the research;
- successfully defend the methods, results, and conclusions drawn from the research in a public forum; and
- communicate new knowledge through the published literature.

In addition to the general learning objectives, students must demonstrate an understanding of the advanced concepts of environmental health sciences as they are related to environmental health, industrial hygiene, and environmental toxicology as evidenced by:

- knowledge of the essentials of pathophysiology and toxicology and ability to apply these principles to the occurrence of diseases among human populations;
- understanding of the dispersion of contaminants in the air, water, and land phases of the environment and how these contaminants affect human health;
- understanding of the appropriate techniques necessary to collect and analyze environmental, medical and biological samples;
- the ability to use chemical, biological, physical and biostatistical tools for evaluating exposure to environmental or occupational toxins;
- the ability to quantitatively assess the probability that environmental agents or processes present a significant risk to human health or the environment; and
- the ability to implement or use environmental policies, processes, and technology, to minimize the impact of human activities on the environment and on human health.

The PhD degree in the Department of Environmental Health Sciences has two foci:

- **Environmental Health Sciences Research**
- **Industrial Hygiene**

Admission: Particular emphasis is placed upon students' interest and their commitment to research. The PhD degree requires an original and carefully thought out research dissertation. Students with previous experience and therefore specific ideas for research are particularly encouraged to apply. The general departmental admission requirements apply to the PhD applicants; however, a previous master's degree is also required. Those students who do not have a master's degree in an appropriate area of environmental health must meet the department's course requirements for the MSPH in environmental health and toxicology or industrial hygiene, depending upon the focus of the PhD dissertation research.

Curriculum: PhD students are expected to complete the department core course requirements, as well as those courses required for their foci and are necessary to prepare them to conduct their dissertation research. Other courses preparatory to dissertation research will be determined by the student in consultation with his/her academic advisor.

Note that although GRD 717 is required, this course will not be considered in the total credit hours required for the degree.

Coursework	**Credit Hours**
PhD Departmental Core	**31**

BST 611	Intermediate Statistical Analysis I	3
ENH 710	Biomedical Sciences Grant Writing	1
ENH 790	Current Topics in Environmental Health Sciences Research	4
ENH 791	Advanced Environmental Health and Toxicology Seminar	7
ENH 796	Environmental Toxicology Lab	15
GRD 717	Principles of Scientific Integrity	1
Environmental Health Sciences Research Focus		**22**
ENH 720/IBS 700	Integrated Biomedical Science for Environmental Health I	2
ENH 721/IBS 701	Integrated Biomedical Science for Environmental Health II	8
ENH 722/IBS 702	Integrated Biomedical Sciences for Environmental Health III: Genetics and Genomics	3
TOX 711	Principles of Toxicology	3
TOX 712	Actions and Assessments of Toxicants	3
TOX 713	Advanced Topics in Toxicology	3
Elective *	At least one elective at discretion of the student and the research advisor	**3**
Research Hours		**Variable**
ENH 798 **	Doctoral Directed Research	Variable
ENH 799 ***	Dissertation Research	Variable
Industrial Hygiene Focus		**15**
BST 612	Intermediate Statistical Analysis	3
ENH 700	Scientific Basis of Environmental Health	3
ENH 701	Environmental Chemistry	3
ENH 770	Advanced Topics in Environmental Disasters	3
TOX 711	Principles of Toxicology	3
Electives *	At the discretion of the student and the research advisor	**18**
Research Hours		**Variable**
ENH 798 **	Doctoral Directed Research	Variable
ENH 799***	Dissertation Research	Variable

Suggested electives: *
EPI 616 Environmental Epidemiology
BST 626/627 Data Management/Reporting with SAS and the associated lab or another upper-level computer based BST course
ENH 752 Genetic Toxicology of Environmental Agents

** Students must register for this course until the comprehensive/qualifying exam and the dissertation proposal is approved leading to admission to candidacy
*** Students may enroll for this course after admission to candidacy and must enroll for a minimum of two semesters but must continue to enroll in this course each term until graduation.

Additional Information

Deadline for Entry Term(s):	April 1
Deadline for All Application Materials to be in the Graduate	February 1

School Office:	
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)
Comments	Additional application for financial aid (fellowship or assistantship) is required by program
Graduate Catalog Description	http://www.soph.uab.edu/ehs/academic

For additional information, please send emails to the address below.

E-mail jebrown@uab.edu

Course Descriptions

Environmental Health Sciences (ENH)

ENH 600. Fundamentals of Environmental Health Sciences. This introductory course is designed to teach public health graduate students the fundamental concepts of environmental health science, the scientific research methods used to study the interaction between human health and the environment, and basic issues in the management of occupational and environmental health problems. Prerequisites: Admission into the MPH program or permission of instructor. College level biology and/or chemistry strongly recommended. This course is also available online with permission of the instructor. 3 hours (Dickinson)

ENH 601. Environmental Chemistry. Chemical concepts applied to pollutant behavior in biosphere; absorption, leaching, evaporation. Mechanisms of chemical modification in environmental, photochemical processes, redox systems, hydrolysis; metabolic transformation of selected pesticides, air contaminants, and hazardous chemical wastes are also discussed. Prerequisite: General Chemistry and Calculus recommended. 3 hours (Squadrito)

ENH 603. Management of Occupational Health and Safety Programs. Provides an overview of management principles as they relate to occupational safety and industrial hygiene, emphasizing the development of the "soft" skills. It provides management training as well as communication techniques for illustrating and justifying changes that are technically sound. The course will review theoretical and practical principles of managing safety and industrial hygiene programs. Real world examples are used to support management theories. 3 hours

ENH 605. Remote Sensing and Public Health (Also ANTH 462). Observing global patterns via satellites can help with research endeavors, this course will focus on the applications of remote sensing to both health and the social sciences. Hands on experience using satellite remote sensing will enrich the experience. 3 hours (Parcak)

ENH 608. Real World Remote Sensing-Public Health Topics (also ANTH 437). The course will give students the chance to learn about a wide range of advanced remote sensing applications in both classroom and lab settings. The course will start out with an overview of article publication preparation and the importance of combining GIS and remote sensing data. The course will progress to students learning GIS applications and analytical techniques, and how to input their remote sensing data into their own GIS for additional analysis. 3 hours (Parcak)

ENH 610. Environmental Disasters. Examines the worldwide problem of toxic disasters, particularly those involving invisible agents (chemicals, infectious disease agents, radiation). Theory, case studies, field experience, and current scientific research are reviewed, and the public health, environmental, human services and public policy implications of toxic disasters are discussed. This course is also available online with permission of the instructor. 3 hours (Fanucchi)

ENH 611. Environmental & Occupational Exposure Assessment. This lecture course is intended to develop an understanding and appreciation of environmental exposure assessment and its role in providing the tools and information for toxicology, epidemiology, and risk management. The course material introduces the general concepts of first recognizing environmental exposures to chemicals in human populations, and then using sampling techniques to assess exposures. This course is available online. 3 hours (Dickinson)

ENH 612. Assessing & Managing Environmentalt Risks. Examination of the methods used in developing environmental policy, with a focus on how toxicology and exposure measurements are used in environmental risk assessment and management. Students will learn the risk assessment process from identifying hazards, assessing exposure, and characterizing the risks, as well as identifying means to evaluate the effectiveness of environmental policies from social and economic perspectives. This course is available online. 3 hours (Gohlke)

ENH 621. Fundamentals of Industrial Hygiene. Chemical, physical and other hazards and stresses found in the work environment. Recognizing potential hazards by understanding industrial processes, toxicity of environmental contaminants, and occupational disease processes. Study design and preparation for field evaluation, conduct of industrial hygiene surveys, and interpretation of survey results. 3 hours (Maples**)**

ENH 622. Industrial Hygiene Application for Hazardous Substances. This course covers industrial hygiene aspects of hazardous waste operations, and the regulatory aspects of those operations. Students will gain knowledge of the OSHA and EPA regulations related to health and safety issues and will learn about personal safety equipment and techniques, administrative controls, and hazardous waste sampling. Prerequisite: ENH 621 or equivalent. 3 hours

ENH 624. Control of Occupational Hazards. Importance of engineering controls in reducing occupational health hazards. Substitution of less toxic substances, modification of work processes, and design of local exhaust ventilation systems; proper selections and use of personal protective equipment, especially respirators, also considered. 2 hours

ENH 625. Industrial Hygiene Case Studies. Integrates students' basic knowledge through consideration of real work-place situations. Step-by-Step analysis of case reports covering occupational health problems in representative industrial situations. Sequential presentation of overview of working conditions, survey strategies, interpretation of results, and recommendations. 2 hours

ENH 626. Physical Agents. Sources**,** effects, and control of occupational and environmental noise, ionizing and non-ionizing radiation, and temperature extremes. Review of exposure standards and introduction of measurement equipment and techniques. 2 hours (Maples)

ENH 636. Evolutionary Medicine (also BY 426 and 626). This course explores the relatively recent and rapidly expanding field of evolutionary or Darwinian medicine, which takes an evolutionary approach to issues related to human health and disease,(i.e., a synthesis of evolution and health sciences). The course is designed as a broad overview of a number of topics, including infectious diseases and the arms race between pathogen and host, genetic diseases, aging, nutrition, cancer, reproductions and development, and behavioral and mental disorders. Prerequisite: Permission of Instructor. 3 hours

ENH 650. Essentials of Environmental and Occupational Toxicology and Diseases. Serves as introductory graduate level course that focuses on multiple aspects of toxicology and disease processes associated with environmental and occupational exposures. Students learn basic terminology and concepts of environmental and occupational toxicology as well as occupational and environmental disease recognition, management and prevention. Emphasis is on scientific foundations rather than on addressing topical issues. The general course orientation is towards basic principles, organ system physiology, diseases and prevention. This course is also available online. 3 hours (Liu)

ENH 651. Risk Assessment of Environmental Hazards. Examination of the methods used in regulatory decision-making based on risks, benefits and costs of a particular action or chemical. Students will learn the risk assessment process from identifying hazards, assessing exposure, and characterizing the risks, as well as identifying factors that contribute to variability in response in human populations and identifying means to control risk. Prerequisite: ENH 650. 3 hours (Gohlke)

ENH 660. Fundamentals of Air & Water Pollution. An integrated introduction to air and water pollution, including its sources, transport, and effects. Focus will be on measurement and characterization of air pollution and the bio-assessment of water quality. Regulatory control of pollutants and the technical aspects of engineering controls will also be given emphasis. 3 hours (Liu/Lungu)

ENH 661. Environmental Sampling and Analysis Lab. This course is designed to provide the students with a thorough understanding of the principles and practice of air and water sampling. The course will focus on contaminant gases, vapors, suspended particulate material and dissolved chemicals in water. A basic understanding of chemistry and physics is prerequisite. Working professionals taking the online version of the MPH in Occupational Health & Safety track will not be required to participate in the lectures and laboratory exercises described in the syllabus of the course. However, slides with lecture commentary will be provided to the students and they will have to submit responses to the quizzes and homework assignments. This course is available online. 2 hours (Lungu)

ENH 670. Fundamentals of Occupational Safety Basic principles of safety and loss control; emphasis on prevention of losses of people, property, and products in work place. Developing competence in human-factors engineering, fire prevention, physical and behavioral science, product safety, and science of accident prevention. 3 hours

ENH 680. Field Interdisciplinary Studies. Field trips to industries throughout Alabama to observe processes and interact with other occupational health personnel. Seminars held with occupational health nursing, industrial hygiene, and safety and ergonomics students to exchange information on latest developments in each field. Prerequisite: ENH 621 or Permission of Instructor. This course is available online. 1 hour (Maples)

ENH 681. Interdisciplinary Worksite Evaluations. To assist students in developing critical thinking and analytical skills, provide them with experience in applying discipline-specific knowledge in a broad occupational health and safety context, and provide experience in working in interdisciplinary teams. The course consists of an overview of survey methodology and information sources, with emphasis on job safety analysis, a review of the occupational site or process to be evaluated and a report of the identified hazards and recommended controls. This course is available online. 2 hours (Maples)

ENH 691. Current Topics in Environmental & Occupational Health & Safety Seminar. Development of communication skills through objectively reviewing scientific literature; presentations and summaries of research or professional activities. This course is available online. 1 hour (Dickinson)

ENH 695. Environmental Health Sciences Seminar. Weekly seminar series of Environmental Health Sciences faculty, postdoctoral fellows, and invited guest lecturers. All PhD candidates in Environmental Health Sciences are required to attend all of the seminars. 1 hour.

ENH 697. Internship. Field experience under joint direction of a public health faculty member and qualified specialist working in selected aspects of public health. Pass/No Pass. 3 hours

ENH 698. Master's Directed Research, Environmental Health. Independent study with guidance of appropriate faculty. Letter grade. 1 - 9 hours

ENH 699. Project Research, Environmental Health. Research for project under direction of research project committee. Letter grade. 1 - 9 hours

ENH 700. Scientific Basis of Environmental Health. This is an overview course that is intended to provide doctoral students with a broad understanding of the scientific principles on which environmental health is based within the context of the interaction of human activities and ecosystems, and the reciprocal impact of those interactions on human health and global ecology. Course will be graded by letter. 3 hours (Dickinson)

ENH 701. Environmental Chemistry. This advanced course covers physical and chemical processes that determine the dynamic nature of the atmosphere and interrelations with water and soil. It also covers measurement methods and data analysis regarding observed concentrations of many key compounds. The course also covers chemical aspects of current environmental change issues, as well as reviews risk assessment as applied to tropospheric air quality. Course will be graded by letter. Prerequisites: ENH 601 is preferred. Other courses emphasizing thermodynamics, kinetics and transport phenomena can be used with permission of instructor. 3 hours (Squadrito)

ENH 702. Advanced Topics in Environmental Management. Building on ENH 612, this advanced course examines emerging issues and challenges in environmental management and policy. Topics include global environmental threats, ecosystem management, ecological risk assessments, and frameworks for integrating science and public policy. Course will be graded by letter. Prerequisite: ENH 602 or 612 or permission of instructor. 3 hours

ENH 705. Special Topics (Readings) in Environmental and Occupational Health. Following topics taught on request on individual basis. 1 - 9 hours each

Radiological Health
Air Pollution
Systems Safety
Advanced Toxicology
Environmental Monitoring
Noise Control
Free Radical Biology & Medicine
Techniques of Biochemical and Molecular Toxicology

ENH 710. Grant Proposal Writing in Biomedical Sciences This course will train second-year graduate students in the intricacies of writing research proposals in the biomedical sciences. Pass/No Pass. 1 hour (Postlethwait)

ENH 763. Aerosol Technology. Defines properties and behavior of aerosols from industrial hygiene and environmental perspectives. Reviews fundamental particle descriptions and critical fluid properties affecting particle behavior. Methods of defining particle size and particle behavior. Methods of defining particle size and size distribution and theories of particle kinetics and their application to particle disposition and collection. Prerequisite: ENH 661, ENH 662. 2 hours

ENH 770. Advanced Topics in Environmental Disasters and Public Health. Examines emerging public health challenges posed by incidents involving chemicals, radiation and biological agents. Students are provided with the opportunity to undertake guided research on current topics in the field and discuss their findings with graduate students and faculty members. Course will be graded by letter. Prerequisites: ENH 610. 3 hours

ENH 780. Seminars in Free Radical Biology and Medicine. This course will consist of research seminars presented primarily by leading national and international scientists working in free radical biology and medicine. These seminars are interactive with questions being asked throughout the presentation. Prerequisite: Permission of Instructor. 1 hour (Dickinson)

ENH 781. Journal Club: Mechanisms of Redox Cell Signaling and Disease. This course will consist primarily of student presentations of peer-reviewed journal articles, and of their research projects. The overall objective of this course is for the student to develop critical thinking skills in the analysis of published research in an area related to their own dissertation research. Course will be graded as Pass/Fail. Prerequisite: Permission of Instructor. 1 hour

ENH 782. Free Radical Chemistry and Biochemistry. This course is for students to gain expertise in the chemical and biochemical reactions of free radicals as they occur in biological systems. Students should be able to critically evaluate the literature with respect to free radical chemistry in biology and medicine, and will be able to correctly employ these basic chemical principles in the experimental design for their own dissertation research. Course will be graded by letter and offered in odd numbered years. Prerequisite: Completion of first year GBS or Permission of instructor. 2 hours (Lancaster)

ENH 783. Free Radicals in Health and Disease. This course is for students to understand the roles that free radicals play in biological systems, both in the maintenance of normal physiology via regulated cell signaling and in contributing to pathology through loss of this regulation. Students should be able to critically evaluate the literature

with respect to the roles of free radicals in health and understanding into their own dissertation research. Course will be graded by letter and offered in odd numbered years. Prerequisite: Completion of first year GBS or Permission of instructor. Co-registration in ENH 782 required. 2 hours (Dickinson)

ENH 790. Seminar: Current Topics in Environmental Health Sciences Research. Interactive forum in which graduate students and faculty discuss dissertation research projects and topics related to the field of Environmental Health Sciences research through the presentation of journal articles. Course is designed to develop oral communication skills for presenting scientific material to peer groups. Presentations by graduate students are followed by discussion and questions. Prerequisite: Permission of Instructor. Pass/No Pass. 1 hour (Dickinson)

ENH 791. Advanced Environmental Health and Toxicology Seminar. Facilitates critical review of recent referred publications in toxicology and presentations of research data. Students are exposed to advanced knowledge and diversified subjects. Prerequisite: ENH 650, ENH 651 or Permission of Instructor. 1 hour (Fanucchi)

ENH 796. Environmental Health Sciences Research. Lab Rotations. Prerequisites: Required for First and Second Year PhD students in the Industrial Hygiene and Environmental Management and Policy foci. Course will be graded by letter. Permission of instructor required to register. 3 hours

ENH 798. Doctoral Directed Research, Environmental Health. Independent study with guidance of appropriate faculty. Pass/No Pass. 1 - 9 hours

ENH 799. Dissertation Research, Environmental Health. Research for dissertation under the direction of the dissertation committee. Pass/No Pass. 1 - 9 hours

Epidemiology (Ph.D., M.P.H., M.S.P.H.)

Degrees Offered: Ph.D., M.P.H, M.S.P.H.)

Director: Dr. Paul Muntner

Phone: (205) 975-8077 , 934-7128 (Judy Baker), or 975-9749 (Kimberly Hawkins)

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Faculty

Olivia Thomas Affuso, Associate Professor (Epidemiology); Chronic Disease Epidemiology, Physical Activity and Chronic Disease Prevention

Brahim Aissani, Assistant Professor (Epidemiology); Genetic Epidemiology, Infectious Disease Epidemiology

Donna Arnett, Professor and Chair (Epidemiology); Cardiovascular Genetic Epidemiology, Pharmacogenetics

Molly S. Bray, Professor (Epidemiology and Genetics); Obesity and Complex Disease Genetics, Physical Activity Epidemiology

Elizabeth Brown, Associate Professor (Epidemiology); Molecular Epidemiology

April Carson, Assistant Professor (Epidemiology); Cardiovascular Epidemiology, Diabetes Epidemiology, Health Disparities

Eric Chamot, Assistant Professor (Epidemiology); Infectious Disease Epidemiology, Screening, International Health and Global Studies

Elizabeth Delzell, Professor (Epidemiology); Occupational Epidemiology, Chronic Disease Epidemiology, Cancer Epidemiology, Pharmacoepidemiology

Virginia Howard, Professor (Epidemiology); Cardiovascular Disease Epidemiology, Stroke Epidemiology

M. Ryan Irvin, Assistant Professor (Epidemiology); Genetic Epidemiology of Cardiometabolic Diseases; Pharmacogenetics

Pauline Jolly, Professor (Epidemiology); Infectious Disease Epidemiology, International Health and Global Studies

Edmond Kato Kabagambe, Associate Professor (Epidemiology); Nutritional Epidemiology, Chronic Disease Epidemiology

Richard A. Kaslow, Professor (Epidemiology); Infectious Disease Epidemiology, Immunogenetics

Emily B. Levitan, Assistant Professor (Epidemiology); Comparative Effectiveness Research, Cardiovascular Epidemiology, Epidemiologic Methods

Gerald McGwin, Professor and Vice Chair (Epidemiology); Injury Epidemiology, Ophthalmic Epidemiology; Epidemiologic Methods

Paul Muntner, Professor (Epidemiology and Medicine); Renal Disease Epidemiology, Cardiovascular Epidemiology

Rodney Perry, Assistant Professor (Epidemiology); Molecular Epidemiology, Laboratory Methods

Jeffrey Roseman, Professor Emeritus (Epidemiology); Chronic Disease Epidemiology, Cardiovascular Epidemiology, Diabetes Epidemiology, Injury Epidemiology

Nalini Sathiakumar, Professor (Epidemiology); Environmental Epidemiology, Occupational Epidemiology, Chronic Disease Epidemiology

Sadeep Shrestha, Associate Professor (Epidemiology); Infectious Disease Epidemiology, Genetic Epidemiology

John W. Waterbor, Associate Professor (Epidemiology); Cancer Epidemiology and Control, Injury Epidemiology and Control, Epidemiologic Methods

Craig Wilson, Professor (Epidemiology); Infectious Disease Epidemiology; International Health and Global Studies

Program Information

MPH in Epidemiology

This program is intended for persons who anticipate careers in public health practice. In addition, students who wish to enter doctoral-level training should consider majoring in epidemiology at the master's level. Graduates of the MPH in Epidemiology may assume faculty or research positions in academia or management positions in government or industry if they have other professional degrees (e.g., MD, DDS) as well. Graduates of the program without professional credentials generally assume mid-level positions in academia, industry or government. The MPH in Epidemiology typically takes 12 to 18 months to complete.

Admission: Applicants must meet the requirements for admission to the UAB School of Public Health and must demonstrate their aptitude for biological sciences and mathematics by virtue of their college transcripts and GRE scores. The Department of Epidemiology admits MPH students for the Fall term each year. Interested applicants should apply at: www.sophas.org. International students should also submit a World Education Services (WES/ECE, or similar) transcript evaluation along with your application materials. The deadline to apply through SOPHAS for the MPH program is April 1st each year.

Curriculum:

MPH Core Sequence Requirement: All MPH core courses MUST be taken in the first two semesters of enrollment except for PUH 695: Integrative Experience, which MUST be taken in the last semester of enrollment or graduation term. BST 611, EPI 610, and HCO 600 are required to be taken in the first Fall term of enrollment. BST 612, EPI 625, ENH 600, and HB 600 are required to be taken in the first Spring term of enrollment. BST 613 MUST be taken in the second Fall term of enrollment. MPH students can take the Internship course (EPI 697) as early as their first Summer term of enrollment.

SOPH Course Requirement: The GRD Writing course is offered every semester and MUST be taken within the first year of enrollment (first Fall, Spring, or Summer term).

MPH – Epidemiology (EPI)

Coursework		**Credit Hours**
MPH Core Requirement (including the Integrative Experience)		**23**
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
ENH 600	Fundamentals of Environmental Health Sciences	3
EPI 610 and 610L	Principles of Epidemiologic Research and Lab	4
EPI 625	Quantitative Methods in Epidemiology	3
HB 600	Social and Behavioral Science Core	3
HCO 600	Introduction to Public Health Systems and Population-Based Health Programs	3
PUH 695	Public Health Integrative Experience	1
SOPH Requirements		**3 or 6**
GRD 727	Writing & Reviewing Research (other GRD courses may be required based on Writing Assessment Exam)	3-6
Epidemiology Methods Track Requirements		**6**
EPI 627	Data Analysis and Presentation of Epidemiologic Studies	3
BST 613	Intermediate Statistical Analysis III	3
At least <u>6 credit hours</u> of the following. Other courses may be substituted with the advisor's approval.		**6**
EPI 601	Vaccinology	3
EPI 602	Epidemiology of Chronic Disease	3
EPI 603	Injury Epidemiologic Principles	3
EPI 604	Infectious Disease Surveillance & Control-Jamaica	3
EPI 605	Epidemiology of Infectious Disease	3
EPI 606	Epidemiology of Cardiovascular Diseases	2
EPI 607	Fundamentals of Clinical Research	3
EPI 608	Tropical Infectious Diseases	3
EPI 609	Pharmacoepidemiology & Comparative Effectiveness Research	3
EPI 613	Cancer Epidemiology & Control	2
EPI 614	Epidemiologic Methods as Applied to Comparative Effectiveness Research	2
EPI 615	Ecology & EPI of Arthropod-Borne Diseases	3
EPI 616	Environmental Epidemiology	3
EPI 617	Occupational Epidemiology	3
EPI 618	Fieldwork in Public Health	2
EPI 621	AIDS/HIV and STDs	3
EPI 624	Grant Applications in an International Setting	3
EPI 630	Data Analysis Using EPI Info	3
EPI 632	Molecular and Genetics Basis of Obesity	3
EPI 635	Genetics in Public Health	2
BST 619	Data Collection and Management	3
BST 626	Data Management with SAS	3
Internship Requirement		**3**
EPI 697	Internship	3
Seminar Requirement		**1**
EPI 695	Epidemiology Seminar	1

Electives (with advisor's approval &in some cases, also approval of instructor) - to complete total hours required for the degree.		
EPI 698	Masters Level Directed Research	1-9
	Total Credit Hours 42	

MSPH in Applied Epidemiology

The MSPH program in Applied Epidemiology is an academic research degree designed for students who wish to receive education and training in epidemiologic research methods. Completion of didactic course work and a thesis research project are required. This degree can be completed in 12-18 months or 4-5 semesters.

Admission: The online application to the MSPH-Applied EPI program can be submitted at www.sophas.org. International students should also submit a World Education Services (WES/ECE, or similar) transcript evaluation along with your application materials. The deadline date to apply for admission is April 1st each year. The Department of Epidemiology admits students in the Fall term each year.

Curriculum: A total of 42 credit hours must be earned to receive the MSPH in Applied Epidemiology degree. Of these 42 total hours, 25 hours are taken to complete the Core requirement (9 semester hours of masters level project research EPI 699 is included in the 25 core credit hours). Students then complete 12 hours of Applied EPI Track courses and 5 hours of track-specific relevant elective credits. Students must consult their academic advisor for approva of track-specific relevant elective creditsl. During the last term of enrollment or final term of graduation, the student is required to complete his/her final thesis project and presentation.

Coursework		**Credit Hours**
MSPH Core Requirements		**25**
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
BST 613	Intermediate Statistical Analysis III	3
EPI 610 and 610L	Principles of Epidemiologic Research & Lab	4
EPI 625	Quantitative Methods in Epidemiology	3
Masters Level Research Requirments (minimum of 9 hours)		
EPI 699	Masters Level Project Research	3
EPI 699	Masters Level Project Research	3
EPI 699	Masters Level Project Research	3
Applied EPI Track Requirements (12 hours)		**12**
EPI 627	Data Analysis & Presentation of Epidemiologic Studies	3
BST 619	Data Collection and Management	3
BST 625	Design and Conduct of Clinical Trials	3
BST Advanced Elective		3

Track-Specific Relevant Electives (5 hours): 5

Specific desireable courses have been identified for each track. Students should consult their advisor and select from among these courses those most relevant to their needsand interests.

Total Credit Hours Required for Degree 42

MSPH in Clinical and Translational Science

There is a growing interest in medical and other health science schools in developing the clinical research skills of faculty members and fellows. This interest has been fueled by increased support from the NIH to prepare such individuals to meet the demand for clinical investigators in the field. Locally, the Schools of Medicine and Public Health have combined efforts to create a training program for young faculty members and fellows from a variety of disciplines.

This program is a post-medical or other health science degree training program, aimed primarily at fellows and faculty members interested in developing skills required for clinical research. It is anticipated that this academic training will supplement extensive training in the content area in which the student is trained, and senior mentoring in the politics and policies of project development and management. A graduate of this program will have the academic training to develop and lead independent research programs and projects. The program consists of a core set of courses common to all students, plus research elective and focus elective courses that reflect the academic interest of the student. At this time, the program can accommodate students with specific interest in Biostatistics (CRBS), **Epidemiology (CTE),** and Health Behavior (CRHB). As a result, there will be some variation in the specific knowledge an skills acquired by each graduate. However, the primary learning objectives will apply to all students, irrespective of departmental affiliation. As such, graduates will be able to do the following upon completion of the program:

- design, conduct, and evaluate clinical research studies
- understand issues of data collection and study management
- follow appropriate policies and procedures relating to the utilization of human subjects in clinical research
- demonstrate an understanding of the ethics of research on human subjects
- prepare competitive applications for extramural research funding
- prepare manuscripts for publication in the scientific literature
- critically evaluate published research

Admission: Applicants should possess a medical or other health science professional degree. They may be in their final years of training as residents or fellows or hold positions as junior faculty members. The Graduate Record Examination (GRE) is required for applications to all MSPH programs in the School of Public Health. The GRE may be waived at the discretion of the committee, for applicants who have been pre-screened by the clinical investigator training grant committee of the School of Medicine. The applicant must produce three letters of reference and a letter stating that he/she will be guaranteed sufficient release time from clinical duties to be able to attend classes regularly and fulfill course requirements in a timely manner. A medical/health sciences mentor should be identified and a setting where the student can gain experience in conducting clinical research. A faculty member within the School of Public Health will be assigned as an advisor based on the stated interests of the applicant. Please submit your application online using the UAB Graduate School's Apply Yourself electronic application system at: https://app.applyyourself.com/?id=uab-grad. The application deadline for the MSPH degree program is April 1st each year.

Curriculum: The MSPH in Clinical and Translational Science consists of a minimum of 42 semester hours. Of these, 25 hours are required, including 9 hours of specific Biostatistics courses and 7 hours of specific

Epidemiology credits. Students then complete 8 hours of Clinical Research Track courses and 9 hours of approved Track-Specific relevant elective credits. Students are also required to complete a minimum of 9 semester hours of Masters Level Directed Research (EPI 699). The MSPH program requires a thesis research project. The final thesis research project is completed during the last enrollment term or graduation term.

MSPH-CTE Coursework		**Credit Hours**
Required Core Courses (25 hours)		**25**
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
BST 613	Intermediate Statistical Analysis III	3
EPI 610 and 610L	Principles of Epidemiologic Research and Lab	4
EPI 625	Quantitative Methods in Epidemiolgy	3
Masters Level Research (minimum 9 hours)		9
EPI 698	Masters Level Directed Research	3
EPI 698	Masters Level Directed Research	3
EPI 698	Masters Level Directed Research	3
Clinical Research Track Requirements (8 hours)		**8**
	Choose One - EPI 607 or BST 625	
EPI 607	Fundamentals of Clinical Research	3
BST 625	Design and Conduct of Clinical Trials	3
EPI 680	Topics in Clinical Research *****	2
GRD 717	Principles of Scientific Integrity	3
Track-Specific Relevant Electives: Students should consult their advisor to identify courses relevant to their needs and interests.		**9**
Total Credit Hours Required for Degree		**42**

Note that care must be exercised when selecting some of these courses since some have prerequisites that must be taken earlier in the sequence of classes or taken concurrently.

***EPI 680: Topics in Clinical Research** is a 2 credit hour class in which students attend and participate in lectures provided through the UAB Center for Clinical and Translational Science beginning each Spring term (January) following Fall admission and extending into the Summer term (June). However, **do not register for EPI 680 until the Summer semester.** The grading is on a Pass/No Pass basis. To earn a Pass grade, students must attend a minimum of 80% of the lectures over two semesters and participate in all discussions during which they are present. Please contact the EPI Program Coordinator for the course syllabus and course schedule.

PhD in Epidemiology

The PhD program emphasizes epidemiologic study design and data analysis. The program is designed to prepare exceptionally qualified individuals for a career of research and teaching. Admission is competitive. Applicants should have earned a Master of Public Health (MPH), Master of Science in Public Health (MSPH), Master of Science (MS) degree or equivalent, with a strong background in epidemiology and statistics. Students who complete the degree will master the skills required for conducting independent research in epidemiology, with a firm background in epidemiology, biostatistics, and information management. Specific areas of concentration include chronic disease, infectious disease, molecular epidemiology, and injury epidemiologic methods. Further details of the program may be obtained by contacting the Program Director, Dr. Paul Muntner at pmuntner@uab.edu. You may also contact the Program Coordinator, Kimberly Hawkins at hawkinsk@uab.edu, or (205) 975-9749.

Admission: Interested students should apply on-line at: https://app.applyyourself.com/?id=uab-grad. Please submit all academic transcripts, 3 letters of recommendation, GRE scores, your personal goals/career goals statement, a current copy of your CV/resume, etc... along with your application for admission. International students should also submit a World Education Services (WES/ECE, or similar) transcript evaluation along with your application materials. The Department of Epidemiology admits PhD students in the Spring for matriculation in the Fall semester only. The application deadline is April 1st each year (Feb. 1st to be consided for financial assistance).

Curriculum: To earn the PhD degree in Epidemiology students must complete a minimum of 60 total credit hours of academic course work. Of this 60 credit hour minimum, 18 semester hours are required and include Biostatistics and Epidemiology courses. 24 semester hours must be earned in doctoral level didactic Epidemiology courses and/or advanced Biostatistics courses. Students must also complete at least 12 semester hours of directed research (EPI 798) and 12 semester hours of dissertation research (EPI 799). Additionally, students must complete at least two semesters in candicay (of EPI 799) before being allowed to graduate.

PhD Coursework		**Credit Hours**
Required Courses (18 Hours)		**18**
BST 621	Statistical Methods I	3
BST 622	Statistical Methods II	3
BST 665	Survival Analysis	3
EPI 709	Theoretical Basis of Epidemiology	3
EPI 710	Analysis of Case-Control Studies	3
EPI 720	Analysis of Follow-Up Studies	3
At least two additional doctoral level Epidemiology courses - Select from the following:		
EPI 703	Grant Proposal Writing	3
EPI 708	Tropical Infectious Diseases	3
EPI 712	Nutritional Epidemiology	3
EPI 713	Cancer Epidemiology and Control	2
EPI 721	HIV/AIDS and STDs	3
EPI 730	Intro to Human Population Genetics	3
EPI 731 and 731L	Genetic Epidemiology and Lab	4
EPI 781	Special Topics in Epidemiology	3
EPI 788	Principles & Methods in Molecular Epidemiology	4
At least one advanced level Biostatistics course		
BST 623	General Linear Models	3
BST 625	Design and Conduct of Clinical Trials	3
BST 640	Nonparametric Methods	3
BST 670	Sampling Methods (offered on demand ≥5 students)	3
BST 671	Meta Analysis	3
At least one doctoral level course in an area of medicine or in one of the major areas of Public Health other than EPI and BST. Please consult your advisor for additional courses.		
ENH 722	Integrated Biomedical Science III	3
HB 714	Survey Research Methods	3
HCO 711	Child Health and Development	3

PAT 700	Biology of Disease	3
PAT 703	Intro to Pathology Research	1
Required Doctoral Seminars (EPI 790 must be taken at least 3 times and EPI 797 must be taken at least 1 time)		
EPI 790	Doctoral Seminar in Epidemiology	2
EPI 790	Doctoral Seminar in Epidemiology	2
EPI 790	Doctoral Seminar in Epidemiology	2
EPI 797	Analysis and Presentation of Epidemiologic Data (offered on demand ≥5 students)	2
Doctoral Level Research (at least 24 hours)		
EPI 798	Doctoral Level Directed Research (register prior to admission to candidacy)	12
EPI 799	Dissertation Research (register after admission to candidacy; must accumulate at least 12 hours and register for at least 2 semesters of EPI 799 prior to graduation)	12
At least one course related to Research Ethics and Scientific Integrity (does not count toward the required 24 credit hours of didactic course work)		
HCO 670	Social and Ethical Issues in Public Health	3
GRD 717	Principles of Scientific Integrity	3
Electives (with advisor's and/or instructor's approval to complete all total hours required)		
	Minimum Credit Hour Requirement	**60**

Masters of Science in Pharmacoepidemiology and Comparative Effectiveness Research

The MSPH-PCER program is an academic research degree that is designed to provide students with special training in Epidemiology research methods as applied to Pharmacoepidemiology and Comparative Effectiveness Research. This MSPH track will present introductory and advanced topics relevant to the field of Pharmacoepidemiology and will include material on information sources used for research in these fields, sources of bias, study designs, analytical approaches, issues of interpretation of research results, and relevant policy and regulatory activities. All trainees will complete a final thesis during their last term of enrollment or graduation term that typically will be in the form of one or more papers suitable for publication and addressing a topic in Pharmacoepidemiology and Comparative Effectiveness Research. A number of databases are available for trainee projects.

Admission: The online application to the MSPH-PCER program can be submitted at www.sophas.org. International students should also submit a World Education Services (WES/ECE, or similar) transcript evaluation along with your application materials. The deadline date to apply for admission is April 1st each year. The Department of Epidemiology admits students in the Fall term each year.

Curriculum: A total of 43 credit hours must be earned to receive the MSPH in Pharmacoepidemiology and Comparative Effectiveness Research. Of these 43 total hours, 25 hours are taken to complete the Core requirement (9 semester hours of required masters level project research EPI 699 is included in the 25 core credit hours). Students then complete 8 hours of PCER Track courses and 10 hours of PCER Track-Specific relevant electives (with the advisor's approval). During the last term of enrollment or final term of graduation, the student is required to complete his/her final thesis project and presentation.

Coursework		Credit Hours
MSPH Core Requirements (25 hours)		**25**
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
BST 613	Intermediate Statistical Analysis III	3
EPI 610 and 610L	Principles of Epidemiologic Research & Lab	4
EPI 625	Quantitative Methods in Epidemiology	3
Masters Level Research Requirements (minimum of 9 hours)		
EPI 699	Masters Level Project Research	3
EPI 699	Masters Level Project Research	3
EPI 699	Masters Level Project Research	3
PCER Track Requirements (8 hours)		**8**
EPI 609	Pharmacoepidemiology & Comp. Effectiveness Research	3
EPI 614	Epidemiologic Methods Applied to Comparative Effectiveness Research	2
GRD 717	Principles of Scientific Integrity	3
Track-Specific Relevant Electives (10 hours): Students should consult their advisor and select from among the courses most relevant to their needs and interests.		**10**
BST 625	Design and Conduct of Clinical Trials	3
	Total Credit Hours Required for Degree	**43**

Additional Information

Entry Term:	Fall semester only
Deadline for All Application Materials to be in the Graduate School Office:	August 1; February 1 to be considered for financial aid
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)

Comments	Visits to campus are recommended. Telephone interviews may be conducted for applicants who are not able to visit UAB.

If you have questions please contact Dr. Muntner, Ms. Baker, or Ms. Hawkins:

Department of Epidemiology, UAB School of Public Health, RPHB 227C, 1530 3rd Avenue South, Birmingham, AL 35294-0022.

Telephone 205-934-7146 (Dr. Muntner), 205-934-7128 (Judy Baker), 205-975-9749 (Kimberly Hawkins); Fax to Department of Epidemiology, 205-934-8665

E-mail pmuntner@uab.edu ; janbaker@uab.edu ; hawkinsk@uab.edu

Course Descriptions

Epidemiology (EPI)

(*) Indicates the course may be taken more than once for credit.

EPI 600. Introduction to Epidemiology.-Principles of epidemiologic thinking. Measures of disease frequency and association. Determinants of disease and distribution of factors influencing health and disease in populations. Epidemiology of diseases of public health importance today. Core requirement for Non-Epidemiology MPH majors. 3 hours. Fall (Thomas)

EPI 601. Vaccinology. - Introduction to the principles underlying disease control and prevention using vaccines. Review of major vaccine-preventable diseases as well as modern vaccine research endeavors. Prerequisites: Clinical doctoral degree (MD, DDS, DVM, DSN, or other similar degrees with approval); or completion of 15 or more credits of master's or doctoral level EPI courses; or permission of instructor. 3 hours. Fall (Edgar Turner Overton).

EPI 602. Epidemiology of Chronic Diseases. - Application of epidemiologic principles to assess the causes of cancer, cardiovascular diseases, diabetes, rheumatoid arthritis, and other chronic diseases. Emphasis on biological basis, rates, association, etiology, prevention, and control. Pertinent literature critically reviewed. Prerequisites: EPI 600 or EPI 610. 3 hours. Course offered every odd calendar year in the Spring.

EPI 603. Injury-Epidemiologic Principles and Prevention Strategies.-Concepts and methods of epidemiology applied to injury; epidemiology of major injury types, utilization of injury data sets; development and evaluation techniques of preventive strategies. Prerequisite: EPI 600 or EPI 610 recommended but not required. 3 hours. Spring (Waterbor)

EPI 604. Infectious Disease Control and Surveillance.- This course is a Study Abroad Opportunity offered jointly by the Department of Epidemiology and the Sparkman Center for Global Health at the University of Alabama at Birmingham (UAB) School of Public Health, the Department of Community Health and Psychiatry at the University of the West Indies (UWI), the Graduate School of Public Health at the San Diego State University (SDSU), and the Jamaican Ministry of Health (MJoH). At the conclusion of this course, students will be able to discuss research design, methods and techniques, describe and

explain multi-factorial approaches to disease surveillance and control, integrate the major disciplines in public health in the context of disease control in Jamaica, and generate and analyze primary field and community based data and prepare electronic presentations of their findings. Course will be graded by letter. Prerequisites: Designed for master's students interested in epidemiology and international health. Advanced undergraduate students with a strong background in biology and/or ecology may enroll with permission of instructor. 3 hours. Summer (Wilson)

EPI 605. Epidemiology of Infectious Diseases.- Introduction to basic principles of infectious disease epidemiology, surveillance, and control. This course will also include critical analysis of the magnitude, distribution, risk factors, and public health significance of selected infectious diseases in community and institutional settings. While the primary geographic focus is the U.S., international comparisons and perspectives will be offered. Primary attention is neither on research methods nor on clinical and pathologic aspects of disease. Prerequisites: EPI 600, EPI 610 or an equivalent introductory epidemiology course or permission of instructor. 3 hours. Spring (Chamot)

EPI 606/706. The Epidemiology of Cardiovascular Disease.- Exploration of the breadth and depth of the epidemiology of cardiovascular disease including history, classification, surveillance, frequency, distribution, etiology, natural history, and control. This course addresses the programmatic details of large-scale epidemiologic studies in cardiovascular disease and the review and critical evaluation of epidemiological evidence on the major risk factors for heart disease and stroke. Primarily a lecture course including guest presentations by experts on selected topics. Prerequisite: EPI 610 or permission of instructor. 2 hours. Course offered **every even calendar year** in the Summer (Howard).

EPI 607. Fundamentals of Clinical Research.- This course will provide an overview of principles and practices related to the study of determinants and outcomes of medical interventions. Methods for conducting epidemiologic research in the "clinic", assessing the validity of diagnostic and screening tests, measuring therapeutic efficacy and safety, and describing the natural history of disease will be reviewed. Prerequisite: Introductory training in epidemiology (e.g., EPI 600 or EPI 610) is recommended but not required.
3 hours. Fall (Glasser)

EPI 608. Tropical Infectious Diseases.-Overview of infectious diseases important in tropical countries, including traditional parasitic diseases (e.g., helminthic and protozoal infections), as well as selected viral and bacterial infections. The agent, fundamentals of clinical course and pathogenesis, mode of transmission, geographic distribution, descriptive epidemiology, and principal methods of prevention and treatment are covered for each disease. Prerequisite: Strong Biology background, contact instructor to discuss. 3 hours. Spring (Jolly)

EPI 609. Pharmacoepidemiology & Comparative Effectiveness Research.- This course is open to graduate students registered in the masters or doctoral program at the UAB School of Public Health and residents and fellows in the School of Medicine, and it may also be of interest to students from graduate health-related programs outside the UAB School of Public Health. The course provides an overview of epidemiologic methods applied to the study of utilization and safety of drugs in large numbers of individuals and an overview of issues and methods used in comparative effectiveness research on drugs, other medical interventions and medical care delivery. Lecturers will present examples of methodological problems and studies based on ongoing research at UAB. 3 hours. Fall (Delzell)

EPI 610. Principles of Epidemiologic Research.-Concepts and methods of epidemiology. Measures of disease frequency, association and impact; study design and analysis, indices of disease and health; overview of major categories of acute and chronic disease, analysis of epidemiologic data sets. Track requirement for EPI majors. Co- requisite: EPI 610L (computer laboratory course) must be taken with EPI 610. 4 hours. Fall (McGwin)

EPI 610L. Principles of Epidemiologic Research-Lab.-Epidemiologic research lab. Co-requisite: Lab must be taken concurrently with EPI 610. 0 hours. Fall (McGwin)

EPI 612/712. Nutritional Epidemiology.-Nutritional epidemiology will cover core concepts in human nutrition including nutrient classification, nutrient sources, nutritional deficiencies, nutritional excesses, recommended daily allowances, basic anthropometry, dietary assessment methods in free-living populations, validation of dietary assessment methods, identification of biomarkers of dietary intake, study designs used in nutritional epidemiology, issues in the analysis and presentation of dietary data, diet-disease associations, gene-diet associations and special topics in nutrition (e.g., folic acid and neural tube defects, fatty acids and the metabolic syndrome, diet and obesity, vitamin A and immune function, vitamins and mother-to-child transmission of HIV, etc). 3 hours. Course offered **every even calendar year** in the Spring.

EPI 613/713. Cancer Epidemiology and Control.- This course will address methodology and substantive issues in cancer epidemiology. Content will include definitions, biological origins and pathological and clinical aspects of cancer; an introduction to information sources and methods in cancer epidemiology; the global burden of cancer; descriptive epidemiology and major risk factors for various forms of cancer; strategies for cancer prevention and the role of epidemiology developing and evaluating those strategies. Prerequisite:Completion of an introductory Epidemiology course (EPI 600, EPI 610, or equivalent). Permission of instructor for students in other programs and schools. 3 hours. Summer (Waterbor)

EPI 614. Epidemiologic Methods Applied to Comparative Effectiveness Research.- This course will focus on methodological issues pertaining to the design, analysis and interpretation of comparative effectiveness research studies. Special focus will be placed on comparative effectiveness research studies using a non-experimental design and large data base analyses. 2 hours. Spring (Muntner)

EPI 615. Ecology and Epidemiology of Arthropod-Borne Diseases.-A course in infectious disease epidemiology. The topic is the epidemiology and control of arthropod-borne diseases. Prerequisites: Previous course or background in general infectious disease epidemiology, and background in biology or microbiology are desirable. Contact course master for guidance if you wish to enroll but are unsure that you are qualified.
3 hours. Spring

EPI 616. Environmental Epidemiology.-Design and conduct of studies examining health effects of environmental exposures. Strengths and limitations of research strategies and interpretation of study results. Areas of interest include air and water pollution, lead, and biological marker outcomes. Prerequisite: EPI 600 or EPI 610. 3 hours. Summer (Sathiakumar)

EPI 617. Occupational Epidemiology.-Epidemiologic methods used in investigation of health effects of occupational exposures; review and critical evaluation of epidemiologic evidence pertaining to effects of selected occupational exposures on human health. Lectures and guest presentations by experts on selected topics. Prerequisite: EPI 610, EPI 610L. 3 hours.

EPI 618. Fieldwork in Public Health.- Application of public health principles in the communicable disease control and environmental health programs carried out at Jefferson County Department of Health. Prerequisites: EPI 610, EPI610L, and EPI 605 or Permission of instructor. Pass/No Pass. 2 hours. Summer (Arnett)

EPI 621/721. HIV/AIDS and STD's.-Basic biology and pathogenesis, historical and current trends, domestic and international epidemiology, determinants of spread, immunogenetics and host susceptibility, options for prevention, surveillance and control of sexually transmitted diseases (STD's) and HIV/AIDS. Prerequisite: Clinical doctoral degree (MD, DDS, DVM, DSN, or other similar degrees with approval); or be at least a second year masters student, or permission of instructor. 3 hours. Fall (Jolly)

EPI 623. Introduction to the SAS Software.-An introduction and overview of the SAS software including navigating the various components of the software, importing and exporting data sets, simple programming to clean and query data sets or create subsets of data. This course does not require or include statistical analyses. Students are required to have a computer with the SAS software installed and

have knowledge of the basic functions in the Windows operating system. Prerequisites: None. This course is open to both masters and doctoral students and the course is assigned a letter grade. 1 hour.

EPI 624/724. Grant Applications in an International Setting.-Students will be expected to write all the sections of a grant proposal with an international focus (as could be submitted to the National Institute of Health or any other recognized funding agency pre-approved by the instructor). The course will offer both didactic (lectures) and hands-on (group work) learning activities. The lectures will provide basic guidelines for completion of the assignments. The hands-on learning format will focus on reviewing assignments and providing feedback on fellow students' work. Prerequisite: Permission of Instructor. 3 hours.

EPI 625. Quantitative Methods in Epidemiology.-An introduction to multivariate techniques and survival analysis as they pertain to epidemiologic data and critical reading of corresponding literature, specifically, logistic regression, log-linear modeling, Poisson regression, life tables, Kaplan-Meier survival curves, and Cox proportional hazards modeling. Track requirement for EPI majors. Prerequisites: BST 612 and EPI 611. 3 hours. Summer May Mini-Term (Funkhouser)

EPI 626. Introduction to Data Analysis with SAS.-The general content will be basic SAS programming focused on fundamental statistical procedures. Upon completion of the course, the student should be able to do simple analysis and programming when given a SAS data set, and complete exercises from more advanced classes in epidemiology and biostatistics.1 hour. Spring

EPI 627. Data Analysis and Presentation of Epidemiologic Studies.-The students will analyze data from an epidemiologic study, addressing a specific question, and prepare a manuscript from their analysis. There are 3 possibilities regarding choice of data: 1) from a list of the instructor's datasets, 2) public use data, 3) from the student's research. Students working on an MSPH or another degree project may use data for that degree-project with approval of their advisor and course master. Upon completion of the course, the student should be able to analyze data from an epidemiologic study and prepare a manuscript. Prerequisites: BST 612, EPI 611, EPI 625 and BST 626 or EPI 626. 3 hours. Fall. (Funkhouser)

EPI 630. Data Analyses Using EPI Info.-Provides practical training in Epi Info and related software packages (SSS1, Logistic, Epi Map) developed by the Centers for Disease Control and Prevention (CDC). Hands-on exercises include: using statistical programs; developing questionnaires and data entry; data editing; analyses of data sets encompassing major study designs; and report writing. Also reviews important epidemiological and statistical principles in context of data analyses. Prerequisites: BST 612 and EPI 610. 3 hours.

EPI 632. Molecular and Genetic Basis of Obesity.- This course focuses on the physiological factors underlying obesity as well as the genetic basis of body size regulation and feeding behavior. The course includes an overview of nutritional biochemistry and metabolism, as well as the development of co-morbidities associated with obesity. Course topics include energy balance, adipose tissue development, gene structure and function, basic genetic principles, satiety signaling, animal models of obesity, treatments for obesity, and obesity as it relates to diabetes, cardiovascular disease, and cancer. Prerequisites: Permission of instructor; intro to Biological Sciences in Public Health and/or undergraduate courses in Biochemistry or Biology preferred. 3 hours. Spring. (Bray)

EPI 635. Genetics in Public Health.- This course will provide a topical overview of issues in public health genetics. The purpose of this course is to introduce students to the complex issues involved in applying and integrating genetic technology and information into public health. Through a series of lectures, students will learn about the history of public health genetics, the role that genetics play in public health, and issues involved in applying genetic technology in clinical and research settings. Lectures will also address the ethical, legal, and social implications of genetic testing in populations and research designed to identify susceptibility genes in diverse ethnic and racial groups. Prerequisites: Currently enrolled in a Master's program. Undergraduates will need permission of instructor. 2 hours. Course offered **every even calendar year** during the Spring. (Shrestha)

EPI 650. Global Perspectives on Disease Prevention and Control.-This course is designed to introduce and/or enhance the fundamental grasp of public health principles in disease control, management, and surveillance for practitioners, teachers, and students of public health in developing countries. EPI 650 will be graded by letter. Prerequisite: Permission of instructor. Prior exposure to the discipline of public health is required. This course is not suitable for the student entering the discipline for the first time, due to its intense nature, but may be suitable for selected first year students who have prior international and/or public health experience. 6 hours. Course offered every even calendar year during the Summer. (Wilson)

EPI 680. Topics in Clinical Research.-Provide health sciences professionals interested in clinical trials, clinical epidemiology, and other forms of population research with both essential principles and specific technical knowledge in a variety of areas relevant to the conduct of biological and behavioral investigation of human subjects. Prerequisite: Limited to health professionals planning clinical research careers who have been accepted into the MSPH in Clinical Research Program. 2 hours. Irregular course that starts in January and ends in June. Register for this course during the Summer term. (McGwin)

EPI 681. Special Topics in Epidemiology.- Discussion of infectious disease research and practice encompassing design, conduct, analysis, and interpretation. Students participate in supervised research and/or in research design. Prerequisite: EPI 605 and permission of instructor for enrolling in EPI 681, and permission of instructor for enrolling in EPI 781. 3 hours

EPI 682. Gorgas Course in Tropical Medicine. Hands-on exposure to tropical diseases and emerging pathogens in various teaching formats: didactic lectures, roundtables, laboratory work, clinical and hospital rounds, case conferences, computer training, field trips and independent study. Course is held in the Spring Term in Lima, Peru. 9 hours (3 or 6 hours are also accepted with evaluation restricted to selected sections of the course). Spring (Freedman)

***EPI 695/795. Epidemiology Seminar Series.** This lectureship series is a forum for scientific dialogue on current topics in epidemiology, biostatistics and public health. The course will promote the development of knowledge about epidemiology methods, analytic approaches, disease etiology as well as natural history and current issues related to the application of these concepts to conducting epidemiologic research and public health practice. Pass/No Pass. 1 hour. Fall and Spring (Arnett)

EPI 696. Master's Epidemiology Seminar.-Critical evaluation of selected epidemiologic papers from published literature. Consideration of composition, study design, and validity of analysis. Editorial review and disposition of manuscripts. Prerequisites: EPI 610 and EPI 611. 3 hours

EPI 697. Internship.-Field experience under joint direction of appropriate public health faculty member and qualified specialists working in selected aspects of public health. Pass/No Pass. 3 hours (240 contact hours required). Fall, Spring, Summer

***EPI 698. Master's Directed Research, Epidemiology.**-Independent study with guidance of appropriate public health faculty. Pass/No Pass. 1 - 9 hours. Fall, Spring, Summer

***EPI 699. Project Research, Epidemiology.** - Research for project under direction of research committee. Pass/No Pass.1 - 9 hours. Fall, Spring, Summer

EPI 701. Advanced Readings in International Health.-Methodologically oriented course highlighting major findings in infectious disease control and prevention. Many highlights from the HIV/STD field in developing countries, emphasizing recent advances. Number of credit hours enrolled depends on the magnitude of the research paper or proposal that is developed. 1-3 hours

EPI 702. Doctoral Seminar in International Health.-Seminar for student presentations of critiques of journal articles relevant to public health. Students will also present their dissertation research for peer review. Faculty presentations will focus on methods/topics of interest to all students. 1 hour

EPI 703. Grant Proposal Writing.-To provide the student with information about grant proposal writing and practice in preparing a grant proposal for submission. The proposal must relate to an epidemiologic topic. Human subject issues are discussed. Prerequisite: Must be a doctoral student or with permission of instructor. 3 hours. Course offered every even calendar year in the Summer (Arnett)

EPI 706/606. The Epidemiology of Cardiovascular Disease.- Exploration of the breadth and depth of the epidemiology of cardiovascular disease including history, classification, surveillance, frequency, distribution, etiology, natural history, and control. This course addresses the programmatic details of large-scale epidemiologic studies in cardiovascular disease and the review and critical evaluation of epidemiological evidence on the major risk factors for heart disease and stroke. Primarily a lecture course including guest presentations by experts on selected topics. Prerequisite: EPI 610 or permission of instructor. 2 hours. Course offered **every even calendar year** in the Summer (Howard)

EPI 708/608. Tropical Infectious Diseases.-Overview of infectious diseases important in tropical countries, including traditional parasitic diseases (e.g., helminthic and protozoal infections), as well as selected viral and bacterial infections. The agent, fundamentals of clinical course and pathogenesis, mode of transmission, geographic distribution, descriptive epidemiology, and principal methods of prevention and treatment are covered for each disease. Prerequisite: Strong Biology background, contact instructor to discuss. 3 hours. Spring (Jolly)

EPI 709. Theoretical Basis of Epidemiology.-This course is designed to complement the notions introduced in EPI 625 (Quantitative Methods in Epidemiology), EPI 710 (The Analysis of Case-Control Studies), and EPI 720 (The Analysis of Follow-up Studies). EPI 709 will provide doctoral students with the theoretical basis underlying key aspects of the design, analysis and interpretation of epidemiologic studies. The course is intended to provide sufficient depth and sophistication in coverage of statistical material as to prepare for independence in epidemiologic research. This aim will be achieved, in part, through the review and discussion of landmark papers that introduced important conceptual and methodological advances in the discipline of epidemiology. The course will cover the following topics in depth: relations among measures of disease frequency, measures of potential impact, confounding and effect modification, matching, statistical inference in epidemiology, and estimation of key epidemiologic parameters. Prerequisites: BST 612 and EPI 625, or permission of instructor. 3 hours. Course offered **every odd calendar year** in the Fall (Chamot)

EPI 710. The Analysis of Case-Control Studies.-This course is designed to provide doctoral students in epidemiology with practical experience in the analysis and interpretation of data from case-control studies. Specific aims are: To outline a strategy for data analysis and review relevant methodologic issues and to apply stratified analysis methods and regression models in the study of diseases of multifactorial etiology. Prerequisites: Permission of instructor. 3 hours. Spring (McGwin)

EPI 712/612. Nutritional Epidemiology.-Nutritional epidemiology will cover core concepts in human nutrition including nutrient classification, nutrient sources, nutritional deficiencies, nutritional excesses, recommended daily allowances, basic anthropometry, dietary assessment methods in free-living populations, validation of dietary assessment methods, identification of biomarkers of dietary intake, study designs used in nutritional epidemiology, issues in the analysis and presentation of dietary data, diet-disease associations, gene-diet associations and special topics in nutrition (e.g., folic acid and neural tube defects, fatty acids and the metabolic syndrome, diet and obesity, vitamin A and immune function, vitamins and mother-to-child transmission of HIV, etc). 3 hours. Course offered **every even calendar year** during the Spring.

EPI 713/613. Cancer Epidemiology and Control.- This course will address methodology and substantive issues in cancer epidemiology. Content will include definitions, biological origins and pathological and clinical aspects of cancer; an introduction to information sources and methods in cancer epidemiology; the global burden of cancer; descriptive epidemiology and major risk factors for various forms of cancer; strategies for cancer prevention and the role of epidemiology developing and evaluating those strategies. Prerequisite:Doctoral student status in any Public Health discipline. Permission of instructor for students in other programs and schools. 3 hours. Summer (Waterbor)

EPI 715. Ecology and Epidemiology of Arthropod-Borne Diseases.-A course in infectious disease epidemiology. The topic is the epidemiology and control of arthropod-borne diseases. Prerequisites: Previous course or background in general infectious disease epidemiology, and background in biology or microbiology are desirable. Contact course master for guidance if you wish to enroll but are unsure that you are qualified. 3 hours. Spring (Novak)

EPI 720. The Analysis of Follow-up Studies.-Designed to provide doctoral students in epidemiology with practical experience in the analysis and interpretation of data from follow-up studies. Specific aims are: to outline a strategy for data analysis and review relevant methodologic issues and to apply stratified analysis methods and regression models in the study of diseases of multifactorial etiology. Prerequisites: Permission of instructor. 3 hours. Fall (Levitan)

EPI 721/621. HIV/AIDS and STD's.-Basic biology and pathogenesis, historical and current trends, domestic and international epidemiology, determinants of spread, immunogenetics and host susceptibility, options for prevention, surveillance and control of sexually transmitted diseases (STD's) and HIV/AIDS. Doctoral students will be responsible for writing a critical review paper or a grant application based on a STD/HIV topic of significant public health importance. Prerequisite: Clinical doctoral degree (MD, DDS, DVM, DSN, or other similar degrees with approval); or be at least a second year masters student, or permission of instructor. 3 hours. Fall (Jolly)

EPI 724/624. Grant Applications in an International Setting.-Students will be expected to write all the sections of a grant proposal with an international focus (as could be submitted to the National Institute of Health or any other recognized funding agency pre-approved by the instructor). The course will offer both didactic (lectures) and hands-on (group work) learning activities. The lectures will provide basic guidelines for completion of the assignments. The hands-on learning format will focus on reviewing assignments and providing feedback on fellow students' work. Prerequisite: Permission of Instructor. 3 hours.

EPI 730. Introduction to Human Population Genetics Theory.-Basic concepts, theory and mathematical principles underlying population genetics, i.e., mechanisms affecting distribution of genes in populations. Prerequisites: Background in genetics, algebra, and statistics; or permission of instructor. 3 hours

EPI 731. Genetic Epidemiology.-This course will cover core concepts of designs, methods and statistical tools in genetic epidemiology studies for determining the contribution of genes to disease risk. Methods for incorporating genetic markers into conventional epidemiologic study designs as risk factors including genetic risk models, familial correlations, migration and admixture, quantitative and qualitative traits, association and linkage analyses in family based designs, allele/haplotype frequency estimation, Hardy Weinberg Equilibrium and linkage disequilibrium and application in both family and population based studies will be discussed. Methods for gene-gene and gene-environment interaction assessment, genome wide association studies are also presented. Prerequisites: College level genetics course; basic biostatistics (BST 600 or BST 611 or BST 621 or equivalent); and basic epidemiology (EPI 600 or EPI 610 or equivalent). Students not meeting these pre-requisites may enroll only with the permission of the instructor. 4 hours. Course offered **every odd calendar year** during the Spring (Shrestha)

EPI 731L. Genetic Epidemiology-Lab.-Genetic EPI lab. Co-requisite: Lab must be taken concurrently with EPI 731. 0 hours. Spring (Shrestha)

EPI 781. Special Topics in Epidemiology. Discussion of infectious disease research and practice encompassing design, conduct, analysis, and interpretation. Students participate in supervised research and/or in research design. Prerequisite: EPI 605 and permission of instructor for enrolling in EPI 681, and permission of instructor for enrolling in EPI 781. 3 hours

EPI 788. Principles and Methods in Molecular Epidemiology.- Molecular biology and its relevance to the epidemiology, etiology and natural history of human diseases. The course will develop knowledge and

skills in molecular biology, genetics and epidemiology methods, and facilitate the application of this information to evaluate susceptibility, etiology, natural history, treatment, and prevention of diseases. 4 hours. Summer (Brown)

***EPI 790. Doctoral Seminar in Epidemiology.**-In depth study and discussion of several areas of epidemiologic methodology not covered in other courses. Students are responsible for selecting and presenting topics. Considerable reading and outside preparation required. Prerequisite: Permission of instructor. Pass/No Pass. 2 hours. Fall and Summer.

EPI 793. DrPH Practicum.-. Field experience practicum which bridges professional academic preparation and advanced public health practice. Pass/No Pass. Fall, Spring, Summer. 6 hours (480 contact hours required).

***EPI 795/695. Epidemiology Seminar Series.** This lectureship series is a forum for scientific dialogue on current topics in epidemiology, biostatistics and public health. The course will promote the development of knowledge about epidemiology methods, analytic approaches, disease etiology as well as natural history and current issues related to the application of these concepts to conducting epidemiologic research and public health practice. Pass/No Pass. 1 hour. Fall and Spring (Arnett)

***EPI 798. Doctoral Directed Research, Epidemiology.**-Independent study with guidance of appropriate faculty. Pass/No Pass. Fall, Spring, Summer. 1 - 9 hours

***EPI 799. Dissertation Research, Epidemiology.** - Research for dissertation under direction of dissertation committee. Pass/No Pass. Fall, Spring, Summer. 1 - 9 hours

Health Behavior (Ph.D., M.S.P.H., M.P.H., M.P.H./M.S.N., M.P.H./Ph.D.)

Faculty

JeeWon Cheong, Assistant Professor

David Coombs, Associate Professor Emeritus

Susan Davies, Associate Professor

Kevin Fontaine, Professor

Frank A. Franklin, Professor Emeritus

Melissa Galvin, Professor

Peter Hendricks, Assistant Professor

Connie Kohler, Professor

Robin Gaines Lanzi, Associate Professor

Terri Lewis, Assistant Professor

Wynne E. Norton, Assistant Professor

Dori Pekmezi, Assistant Professor

Martinique Perkins, Assistant Professor

Kerstin Schroder, Associate Professor

Cathy Simpson, Associate Professor

Jalie Tucker, Professor & Chair

The major instructional goal of the department is: to train health promotion specialists/behavioral scientists to conduct research, develop and evaluate programs, implement and disseminate programs and integrate ethical, cultural and social justice topics as they address the public's health.

Health Behavior MPH and PhD students use theories and methods from the social and behavioral sciences to develop programs that encourage adopting healthy behaviors. They learn state-of-the-art techniques and methods for research and program evaluation, and doctoral students study these topics in depth as they apply their knowledge and skills to conducting research and writing funding proposals and manuscripts. Many students are involved in faculty research projects concerning a broad range of health problems including infectious diseases (HIV/AIDS and other sexually transmitted diseases), tobacco, alcohol, and other substance use, obesity, aging, cardiovascular disease, cancer, and intentional or unintentional injuries.

Career Opportunities

Demand for qualified behavioral scientists and health education specialists continues to increase with the current national focus on preventive care. Graduates of our master's degree programs are typically employed in public and private agencies at the local, state, and national levels such as health departments, health care institutions, and health-related outreach and non-profit agencies. They work to develop, implement, and evaluate health promotion and disease prevention programs. Graduates of our doctoral program go on to research and service careers in academic settings or public agencies such as the Centers for Disease Control and Prevention.

Health Behavior MPH Learning Objectives

The objectives of the MPH in Health Behavior are:

- Understand and apply social and behavioral science theories as they relate to public health;
- Review and critically evaluate the existing health education and behavior literature;
- Develop valid and reliable theory-based assessment tools;

· Develop, implement, evaluate and disseminate health promotion and disease prevention programs; and
· Gain the professional experience and expertise with the goal to protect the in public's health.

MPH in Health Behavior (HB)

The Master of Public Health program in health behavior is the basic public health professional degree in social and behavioral science. **Students in this track take 44-47 credit hours.** The number of credit hours is determined before admission based on students' education and professional experience. Full-time students can generally complete the program in four to five semesters depending on number of credit hours needed.

Students in the MPH in Health Behavior are taught methods to identify and understand factors that affect behaviors related to personal and community health and to develop and evaluate intervention programs that promote healthy lives. Students are required to complete an internship. The internship is three credit hours and takes place following the completion of core course work.
Admission: Applicants should have a strong academic record and meet the minimum requirements for admission to the School of Public Health.

Curriculum: In addition to the MPH core requirements, students take 9 hours of health behavior track courses, 9 hours of electives, 4-7 hours of SOPH requirements, and a 3 hour internship.

Coursework		**Credit Hours**
MPH Core (including the Integrative Experience)		**19**
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
ENH 600	Fundamentals of Environmental Health Sciences	3
EPI 600	Introduction to Epidemiology	3
HB 624	Advanced Theory and Practice in Behavioral Science	3
HCO 600	Introduction to Public Health Systems and Population-Based Health Programs	3
PUH 695	The Public Health Integrative Experience	1
Departmental Track Requirements		**9**
HB 630	Health Communication: Theory and Practice	3
HB 641	Research Methods	3
HB 643	Health Program Evaluation	3
Behavioral Science Electives		**9**
SOPH Requirements		**4-7**
EPI 623	Intro To SAS Software	1
GRD	Writing Course/s	3-6
Internship		**3**
HB 697	Internship	3
		Total 44-47

Coordinated MPH/MSN in Health Behavior

The coordinated MPH in Health Behavior/MSN degree is designed to address health behavior content and methods needed by advanced practice nurses. This program of study prepares graduates to participate in the development, implementation, and evaluation of innovative health behavior programs and policies. Graduates may assume a variety of positions in nursing or health behavior including health behavior program directors and project coordinators. This dual degree program builds on the synergy generated through two complementary curriculum tracks.

Admissions: Students are admitted separately to the MPH and MSN degree programs and must meet admission requirements in both the School of Public Health and the School of Nursing.

Curriculum: Students must complete a minimum of 44-47 semester hours of credit for the MPH degree, which includes six credit hours of required Nursing course work. Nineteen credits in the School of Public Health meet the requirements for core courses in the Master of Public Health program and provide a strong knowledge base in epidemiology, biostatistics, health behavior, environmental health sciences and health care organization and policy. Twenty-five to twenty-eight additional credits (15 Health Behavior credit hours, 4-7 SOPH requirements credit hours and 6 Nursing credit hours) meet the requirements for the Health Behavior track in the School of Public Health. The coordinated MPH/MSN degrees can be completed in two years or six consecutive terms if the student registers for full-time study beginning in the fall term. If a coordinated degree student drops out of the MSN program, he/she must apply for transfer to the MPH Health Behavior track.

Coursework		**Credit Hours**
MPH Core (including the Integrative Experience)		**19**
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
ENH 600	Fundamentals of Environmental Health Sciences	3
EPI 600	Introduction to Epidemiology	3
HB 624	Advanced Theory	3
HCO 600	Introduction to Public Health Systems and Population-Based Programs	3
PUH 695	The Public Health Integrative Experience	1
Health Behavior Track		**15**
HB 630	Health Communications: Theory and Practice	3
HB 641	Research Methods	3
HB 643	Health Program Evaluation	3
HB 697	Internship	3
HB Elective	HB Elective	3
SOPH Requirements		**4-7**
EPI 623	Intro to SAS Software	1
GRD	Writing Course/s	3-6
Required Nursing Courses for Health Behavior Track*		**6**
NUR 602Q	Issues Affecting Advanced Nurse Practice	3
NUR 612Q	Advanced Pathophysiology	3
		MPH Total 44 - 47

* See the School of Nursing Catalog for the requirements for the MSN portion of the dual MPH/MSN degree.

Coordinated MPH/PhD in Health Behavior and Psychology or Sociology

This dual degree program is offered in cooperation with the UAB Departments of Psychology and Sociology; and the University of Alabama (Tuscaloosa) Department of Psychology. This program enables students to obtain an MPH degree in Health Behavior simultaneously with a PhD in Psychology or Sociology.

Admission: Applicants to this program must first be admitted to the PhD program of interest. Applicants must meet the minimum requirements for admission into the School of Public Health.

Curriculum: The MPH degree requires a minimum of 47-50 credit hours. Selected MPH required courses, such as Research Methods, will be waived in this coordinated program when students can demonstrate that they have taken an equivalent course in the PhD program, although the required number of credit hours will not change. Because this is a coordinated dual degree track, graduation from the MPH program is contingent on completion of all requirements for graduation from the PhD program. If a coordinated degree student drops out of the PhD program, he/she must apply for transfer to the MPH Health Behavior track.

Coursework		**Credit Hours**
MPH Core (including the Integrative Experience)		**19**
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
ENH 600	Fundamentals of Environmental Health	3
EPI 600	Introduction to Epidemiology	3
HB 600	Social and Behavioral Science Core	3
HCO 600	Introduction to Public Health Systems and Population-Based Health Programs	3
PUH 695	The Public Health Integrative Experience	1
Health Behavior Track		**15**
HB 634	Advanced Theory	3
HB 630	Health Communications: Theory and Practice	3
HB 641	Research Methods	3
HB 643	Health Program Evaluation	3
HB 697	Internship	3
Behavioral Science Electives		**9**
SOPH Requirements		**4-7**
EPI 623	Intro to SAS Software	1
GRD	Writing Course/s	3-6
		Total 47-50

PhD in Health Education and Health Promotion

The PhD program in health education/promotion provides students with instruction and research experience to become practitioners and scientists in health education and health promotion. The program also combines the resources of academic units from the University of Alabama at Birmingham (UAB – School of Public Health, Department of Health Behavior, UAB- School of Education, Department of Human Studies), and the University of Alabama (UA – College of Human Environmental Sciences, Department of Health Science), and utilizes the research expertise common to schools of public health along with the didactic, professional emphasis found in other health education programs. The specific objectives of the program are to enable the students to:

- Develop the skills to effectively plan, implement, and evaluate health education/promotion intervention programs;
- Develop theoretical knowledge from social and behavior sciences;
- Develop the knowledge and skills to become independent researchers;
- Complete a substantive research experience integrating the first three objectives.

Admission to Ph.D. program in the SOPH Department of Health Behavior

Student applications are reviewed by the faculty in the Department of Health Behavior. Applicants should meet the admissions requirements of the graduate school, including submission of scores on the Graduate Record Exam (GRE). Admission to the program is competitive. Evidence of scholarship, a clear statement of career goals and research interest, professional recommendations, and professional experience are among the factors receiving strong consideration. Candidates for admission must have completed a master's degree from an accredited institution in public health, health education or a related field.

The PhD program requires completion of a minimum of 67 hours of graduate credit, satisfactory performance on comprehensive exams, and completion of a doctoral dissertation.

Coursework		**Credit Hours**
Health Education/Promotion Core Courses		**12**
HB 730	Health Communications Research	3
HB 750	Advanced Theoretical & Scientific Basis of Health Education & Promotion	3
HB 760	Planning & Administration of Health Education & Promotion	3
HB 770	Doctoral Studies Seminar	3
Advanced Research and Statistical Methods Courses		**16**
BST611 *	Intermediate Statistical Analysis I (or)	3
EPR 609 **	Statistical Methods and Research in Education	3
BST 612	Intermediate Statistical Analysis II (or)	3
EPI 710	Computer Applications and Advanced Statistical Methods	3
BST 619	Data Collection Management (or)	3
SOC 701	Data Management and Analysis	3
EPI 610	Principles of Epidemiologic Research	4
EPI 610L	Principles of Epidemiologic Research - Lab	0
HB 740	Advanced Health Program Evaluation	3
Evaluation/ Research Methods/Statistics Electives		**6**
Social and Behavioral Sciences Electives		**9**
Directed Research		**12**

HB 798	Doctoral Directed Research	12
		12

Dissertation Research

HB 799	Doctoral Dissertation Research	12
		Total 67

* BST 611 is the prerequisite for BST 612
** EPR 609 is the prerequisite for EPR 710

Specific courses needed for completion of the advanced research and statistical methods requirement may vary and require approval by the student's academic advisor. Specific courses for the social science concentration are selected by the student and his/her academic advisor. Students may transfer a minimum of 12 credits from comparable graduate courses completed previously if those courses were not used to complete another degree, are graduate level, and a grade of at least a B.

Research Internship
A research internship is required. The internship gives students an opportunity to engage in a meaningful research experience by working with ongoing faculty research projects. The internship may be carried out in any one of the three academic units contributing to the PhD program or with approved research projects in other academic units at UA or UAB, or with the CDC, NIH, or other governmental or private agencies.

Comprehensive Exam
Doctoral students are required to take comprehensive examinations before proposing a dissertation. At a minimum, the exams cover the scientific and theoretical basis of health education and health promotion, the design and evaluation of health promotion programs and research methods in health promotion. Prior to taking the comprehensive exams, **the student must have completed the Health Education/Promotion Core Courses**. Students will be eligible to take part one after completing 12 hours of the core courses.

Doctoral Dissertation
The doctoral dissertation is designed to provide students with a comprehensive and original research experience, and it requires the completion of a minimum of 12 hours of dissertation credit. Students complete credits for the dissertation after completing coursework and comprehensive exams, and being admitted to candidacy.

All PhD students must meet the graduation requirements of their department and the Graduate School.

MSPH Clinical Research

In response to interest in medical and other health science schools in developing the clinical research skills of faculty members and fellows, the Schools of Medicine and Public Health have combined efforts to create a training program for young faculty members and fellows from a variety of disciplines.

This program is a post-medical or other health science degree training program, aimed primarily at fellows and faculty members interested in developing skills required for clinical research. It is anticipated that this academic training will supplement extensive training in the content area in which the enrollee is trained, and senior mentoring in the politics and policies of project development and management. A graduate of this program will have the academic training to develop and lead independent research programs and projects. The program consists of a core set of courses common to all students, plus research elective and focus elective courses that reflect the academic interest of the student. Graduates will be able to do the following upon completion of the program:

- design, conduct, and evaluate clinical research studies;
- understand issues of data collection and study management;
- follow appropriate policies and procedures relating to the utilization of human subjects in clinical research;
- demonstrate an understanding of the ethics of research on human subjects;
- prepare competitive applications for extramural research funding;
- prepare manuscripts for publication in the scientific literature; and
- critically evaluate published research.

Admission: Applicants should possess a medical or other health science professional degree. They may be in their final years of training as residents or fellows or hold positions as junior faculty members. Applicants must meet the minimum requirements for admission into the School of Public Health. The Graduate Record Examination (GRE) is required for applications to all MSPH programs in the School of Public Health. The GRE may be waived at the discretion of the committee, for applicants who have been pre-screened by the clinical investigator training grant committee of the School of Medicine. The applicant must produce three letters of reference and a letter stating that he/she will be guaranteed sufficient release time from clinical duties to be able to attend classes regularly and fulfill course requirements in a timely manner. A medical/health sciences mentor should be identified and a setting where the student can gain experience in conducting clinical research. A faculty member within the School of Public Health will be assigned as an advisor based on the stated interests of the applicant.

Curriculum: The MSPH in Clinical Research consists of a minimum of 41 credit hours. Of these, 14 hours are required, including 9 hours of specific biostatistics courses and 5 hours of specific epidemiology courses. Students then select at least 9 credit hours from a list of approved *Masters Research* electives, complete 9 hours of focus specific electives in Health Behavior, and take at least 9 hours of (698 level) Masters Research to fulfill the MSPH requirement for conducting a research project.

Coursework		**Credit Hours**
Required Core Courses		**14**
BST 611*	Intermediate Statistical Analysis I	3
BST 612*	Intermediate Statistical Analysis II	3
BST 625	Design and Conduct of Clinical Trials	3
EPI 607	Epidemiology of Clinical Research	3
EPI 680	Topics in Clinical Research	2
Masters Research Electives: Nine credit hours should be selected by faculty advisor and student		**9**
BST 619	Data Collection and Management	3
BST 626/626L	Data Management/Reporting with SAS	3
ENH 650	Essentials of Environmental and Occupational Toxicology & Diseases	3
EPI 611	Issues in Epidemiologic Design & Analysis	4
EPI 625	Quantitative Methods in Epidemiology	3
EPI 703	Grant Writing	3
EPI 709	Theoretical Basis of Epidemiology	3
HB 624	Advanced Theory and Practice in Behavioral Science	3
HCO 677	Patient-Based Outcomes Measurement	3
Focus Specific Electives: Nine hours in field of interest selected by faculty advisor and student. With approval of the student's advisor, courses included in the Research Electives that are not taken to meet that requirement may be taken as a part of the Focus Specific Electives		**9**

HB 630	Health Communications	3
HB 641	Research Methods	3
HB 643	Health Program Evaluation	3
Masters Directed Research: Nine hours of research (698 level) in a clinical setting (directed).		**9**
BST 698, EPI 698, HB 698, or ENH 698 (depending upon the area of study)		
	Total Hours	**41**

*** Students who want to focus their degree on Biostatistics should take BST 621/622 rather than BST 611/612 since the former are prerequisites for more advanced Biostatistics focus courses. In addition, other students who wish to receive higher level mathematical training in Biostatistics could substitute BST 621/622 for BST 611/612.**

Note that care must be exercised when selecting some of these courses since some have prerequisites that must be taken earlier in the sequence of classes or taken concurrently.

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

Health Behavior (HB)

HB 600. Social and Behavioral Science Core. This course is structured to provide students with a basic "starting point" for developing the required competencies in this area. The course consists of information delivery (e.g., lectures, readings), practice and application exercises, and knowledge integration and synthesis activities. Successful completion of this course will enable you to describe the role of social and community factors in both the onset and solution of public health problems; identify the causes of social and behavioral factors that affect health of individuals and populations; identify basic theories, concepts and models; apply ethical principles to public health program planning, implementation and evaluation; specify multiple targets and levels of intervention; identify individual, organizational and community concerns, assets, resources and deficits; apply evidence-based approaches in the development and evaluation of interventions; describe the merits of social and behavioral science interventions and policies; describe steps and procedures for the planning, implementation and evaluation of public health programs; and identify critical stakeholders for the planning, implementation and evaluation of public health programs, policies and interventions. Course will be graded by letter. 3 hours. (Pekmezi)

HB 600Q.Social and Behavioral Science Core (On-line). This course is structured to provide students with a basic “starting point” for developing the required competencies in this area. The course consists of information delivery (e.g., lectures, readings), practice and application exercises, and knowledge integration and synthesis activities. Successful completion of this course will enable you to describe the role of social and community factors in both the onset and solution of public health problems; identify the causes of social and behavioral factors that affect health of individuals and populations; identify basic theories, concepts and models; apply ethical principles to public health program planning, implementation and evaluation; specify multiple targets and levels of intervention; identify individual, organizational and community concerns, assets, resources and deficits; apply evidence-based approaches in the development and evaluation of interventions; describe the merits of social and behavioral science

interventions and policies; describe steps and procedures for the planning, implementation and evaluation of public health programs; and identify critical stakeholders for the planning, implementation and evaluation of public health programs, policies and intervention. Course will be graded by letter. 3 hours. (Pekmezi)

HB 602. Alcohol and Drug Abuse. History and theory of human substance use and abuse. Empirical foundations of alcohol and drug abuse, diagnosis, assessment, treatment, and prevention. Course will be graded by letter. 3 hours.

HB 605. Physical Activity and Health. This seminar course is an introduction to research and practice related to physical activity promotion from a public health perspective and will describe health benefits, epidemiological data, national recommendations and plans, and global initiatives related to physical activity. Course will be graded by letter. 3 hours (Pekmezi).

HB 609. African-American Health Issues. This is an intermediate-level course that focuses on: epidemiological data illustrating the health risks experienced by African-Americans; sociocultural factors essential for understanding and enhancing the health of African-Americans; effective health-related prevention programs for African-Americans. Course will be graded by letter. 3 hours. (Perkins)

HB 611. Mental Illness as a Public Health Issue. This course is designed to increase knowledge of mental illness at the individual, community, and population levels. It also covers historical and contemporary models and research on the etiology, diagnosis, assessment, treatment and prevention of mental and other behavioral health disorders. Course will be graded by letter. 3 hours.

HB 624. Advanced Theory and Practice in Behavioral Science. Advanced review of selected behavioral science concepts and theories useful for developing health promotion programs; social cognitive theory and the transtheoretical model of change are examined in depth. This course may be required for some MPH students. Course will be graded by letter. 3 hours (Schroder).

HB 625. Dissemination and Implementation in Health. The course will offer an introduction to dissemination and implementation science, an interdisciplinary field focused on improving the transition of evidence-based health practices, programs, and interventions from research studies into “real-world” settings. Course will be graded by letter. 3 hours (Norton).

HB 630. Health Communications: Theory and Practice. This course is designed to investigate the role of communication theories and methods in promoting public health and preventing disease. Both theoretical background in communication and behavioral science and practical communication/intervention development methods are addressed. Course will be graded by letter. Pre-requisite: HB 624. 3 hours (Kohler).

HB 635. **Communities, Families and Health.** This course is designed for graduate students in public health and related fields interested in working with families and communities to improve health outcomes. It is intended to provide students with a broader understanding of the structural and psychosocial factors related to health and well-being. To do so, the course will focus on theoretical frameworks that draw on an ecological perspective and examine how factors associated with families, peers, schools, neighborhoods, and communities influence health. Emphasis will also be placed on the relevance of individual and community assets for the science of Health Behavior and the broader public health arena. Course will be graded by letter. 3 hours (Davies/Perkins).

HB 638Q.**Public Health Promotion and Aging Seminar (Online).** Exploration of current problems of the elderly, introduction to broad principles of health promotion for the elderly and review model health promotion programs. Course will be graded by letter. 3 hours (Galvin).

HB 641. Research Methods in Behavioral Sciences. Review of research methodology in behavioral sciences. Formulation of research questions, causality, experimental and quasi-experimental designs, reliability and validity, reporting findings. Course will be graded by letter. 3 hours(Lewis/Norton).

HB 643. Health Program Evaluation. Principles and procedures to evaluate health promotion/disease prevention programs: data collection methods, instrument-scale development, measurement, evaluation designs and analysis of case studies of disease prevention literature on evaluation. Course will be graded by letter. Prerequisite: HB 641. 3 hours. (Davies)

HB 660. Adolescent Health: A Social and Behavioral Perspective. Designed to provide students with the most current knowledge and analysis of issues influencing the health and well-being of adolescents. Theoretical frameworks that draw on an ecological perspective will provide a better understanding of how families, peers, schools, and neighborhoods influence risk and protective factors in youth. Emphasis will be placed on the relevance of adolescent health issues for the science of Health Behavior and the broader public health arena. Course will be graded by letter. 3 hours(Lanzi).

HB 665. Family Violence & Victimization. This course will focus on multi-disciplinary theoretical frameworks to explain family violence and subsequent effects on child/youth/young adult functioning including behavioral, social, and physical and mental health consequences. Course will be graded by letter. Prerequisite: HB 624 3 hours (Lewis).

HB 680. Health Promotion through Entertainment Education. Alternative methods for delivering health promotion messages to "hard-to-reach" audiences are being explored across the U.S. This course examines the strategy known as "entertainment education". Course will be graded as Pass/No Pass. 3 hours (Kohler).

HB 692. Principles and Practices of Community Organization. Seminar designed as an integrative experience for persons working with community groups. The focus is on learning to use available resources and advocating change to maximize community involvement. Course will be graded by letter. Prerequisite: Permission of Instructor. 3 hours

HB 695. Seminar on Selected Health Behavior Topics. Seminar covering a variety of health behavior topics. Course will be graded as Pass/No Pass. Prerequisite: Permission of instructor. 3 hours.

HB 697. Internship. Field experience under joint direction of appropriate faculty member and qualified health education specialist. Written report specifying activities, products, and outcomes of experience submitted upon completion of internship. Course will be graded as Pass/No Pass. 3 hours.

HB 698. Master's Directed Research. Independent study with guidance of appropriate faculty. Includes activities such as literature review and evaluation. Course will be graded as Pass/No Pass. 1 - 9 hours.

HB 699. Master's Project Research. Research for project under direction of research project committee. Course will be graded as Pass/No Pass. 3-6 hours.

HB 701. Theory-Based Measurement Development. The aim of this course is to introduce students to measurement development based on well-specified behavioral theories. This course will review and discuss key issues related to measurement development such as item/scale development, number of factors to retain rotation options and statistical programs. Prerequisite: Requires knowledge of elementary probability and statistics for non-statistics majors and BST 611. Course will be graded by letter. 3 hours (Hendricks).

HB 730. Health Communication Research. This course is designed to investigate the role of communication theories and research methods in promoting public health and preventing disease. Theoretical background in communication and behavioral science, research methods appropriate for mass media campaigns and practical communication/intervention development methods will be addressed. Course will be graded by letter. 3 hours (Kohler).

HB 740. Advanced Program Evaluation. Advanced review of evaluation theories, approaches, and methods for assessing the plans, implementation, and effectiveness of health promotion programs.

Course will be graded by letter. Prerequisite: HB 643 or other master's level evaluation course and a graduate level multiple regression or multivariate statistics course. 3 hours. (Davies)

HB 750. Advanced Theoretical and Scientific Basis of Health Education and Promotion. Provides doctoral students with in-depth examination of history and philosophy of health education; reviews professional competencies and outlines major theories of behavior change. Course will be graded by letter. 3 hours. (Turner).

HB 760. Planning and Administration of Health Education and Promotion Programs. The purpose of this course is to teach and practice the three basic phases of comprehensive health education and promotion programs (planning, implementation and evaluation). Course will be graded by letter. 3 hours (Geiger).

HB 771. Doctoral Studies Seminar I. This course is the first of a series of three 1-hour Doctoral Seminar classes. This seminar series is designed to meet the specific needs of graduate students by better preparing them for successful completion of their respective degrees as well as their future as health education professionals. Course will be graded by letter. 1 hour (Usdan).

HB 772. Doctoral Studies Seminar II. This course is the second in a series of three 1-hour Doctoral Seminar classes. This seminar series is designed to meet the specific needs of graduate students by better preparing them for successful completion of their respective degrees as well as their future as health education professionals. Course will be graded by letter. Pre-requisite HB 771. 1 hour (Usdan).

HB 773. Doctoral Studies Seminar III. This course is the third of a series of three 1-hour Doctoral Seminar classes. This seminar series is designed to meet the specific needs of graduate students by better preparing them for successful completion of their respective degrees as well as their future as health education professionals. Course will be graded by letter. Pre-requisites HB 771 & 772. 1 hour (Usdan).

HB 798. Doctoral Directed Research. Independent study with guidance of senior public health faculty. Course will be graded as Pass/No Pass. 1 - 9 hours

HB 799. Dissertation Research. Research for dissertation under direction of dissertation committee. Course will be graded as Pass/No Pass. Prerequisite: Students must be admitted to candidacy in order to register for this class.1 - 9 hours.

Health Care Organization and Policy (Dr.P.H., M.P.H, M.S.P.H.)

Faculty

David J. Becker, PhD, Professor

Janet M. Bronstein, PhD, Professor

W. Jack Duncan, PhD, Professor of Management and University Scholar Emeritus

E. Michael Foster, PhD, Professor

Peter M. Ginter, PhD, Professor

Lisle Hites, PhD, Assistant Professor

Meredith Kilgore, PhD, Professor and Chair

Andrezej Kulczycki, PhD, Associate Professor

Julie Locher, PhD, Associate Professor

Lisa McCormick, DrPH, Assistant Professor

Nir Menachemi, PhD, Professor

Stephen T. Mennemeyer, PhD, Professor

Max Michael III, MD, Professor and Dean

Michael Morrisey, PhD, Professor

Beverly Mulvihill, PhD, Associate Professor

Mary Ann Pass, MD, Research Associate Professor

Julie Preskitt, PhD, Assistant Professor

Andrew Rucks, PhD, Professor

Bisakha Sen, PhD, Associate Professor

Janet M. Turan, PhD, Associate Professor

Kari White, PhD, Assistant Professor

Martha Wingate, DrPH, Associate Professor

Research and instructional foci in this department include health economics, public health administration and planning, health policy, outcomes research and health services evaluation.

Programs in the Department of Health Care Organization and Policy (HCOP) are designed to provide training and education at the master's level for those desiring a professional career in the analysis of health services policy options, outcomes research, maternal and child health policy or in the management of public health programs. The didactic programs of the department require that students master the major concepts of:

- health economics,
- public health management and planning,
- health policy,
- outcomes research,
- health services evaluation, and
- policy and leadership in maternal and child health

The instructional programs of the department address the need for:

- Administrators with training in management, law, public health policy, health economics, epidemiology, and biostatistics;

- Individuals with specific training in health policy analysis;
- Individuals capable of assessing treatment protocols and outcomes;
- Professionals with training in both law and public health;
- Individuals pursuing other professional degrees desiring an emphasis in health care; and
- Enhanced skills of established health workers, clinicians, or other professionals through didactic training in Public Health and Health Care Organization.

The department offers Master of Public Health (MPH) degree options in health care organization, health policy, general theory and practice, maternal and child health policy, and in public health preparedness and management. Also offered are a coordinated Master of Public Health/Juris Doctorate program, a coordinated Master of Public Health/Master of Business Administration program, a coordinated Master of Public Health/Doctor of Optometry program, a coordinated Master of Public Health/Master of Nursing program, a coordinated Master of Public Health/Master of Social Work program, a coordinated Master of Public Health/Master of Public Administration program. The department offers the Master of Science in Public Health (MSPH) option in outcomes research and a coordinated MSPH/PhD degree program with the Department of Psychology. A Doctor of Public Health (DrPH) degree is offered in public health management and maternal and child health policy.

Career Opportunities

Rapid changes taking place in both the private and public sectors of health care and related industries have created a need for a broad spectrum of qualified professionals to manage complex institutions, organizations, and public health services delivery programs. Additionally, these changes have created an increased demand for professionals with expertise in policy analysis, outcomes research, strategic planning, and health economics. Depending on their educational background, experience, and interests, graduates of our programs typically find positions at all levels of federal, state, and local public health agencies, industry, consulting firms, traditional and non-traditional health services delivery organizations, managed care organizations, voluntary organizations, federal and state legislative offices, research organizations, or law firm**s.**

MPH in Health Care Organization

The MPH in health care organization is designed to train individuals for management positions in public health and other health care organizations. Students are introduced to the public health system and the fundamental skills necessary for managing health care organizations. Required coursework includes basic management disciplines and selected content in economics, finance, marketing, law and insurance.

Health Care Organization Learning Objectives

- describe the economic, legal, organization, and political underpinnings of the US health system;
- apply principles of management, finance, marketing, accounting and strategic planning in health care organizations; and
- apply basic planning and management skills necessary for successful administration of health care organizations.

Admission: Applicants to the Master of Public Health in Health Care Organization must meet the general admission requirements for the Master of Pubic Health degree program. Applicants with a previously earned doctoral degree may be waived from the requirement to submit a GRE score. Students may apply for admission to this program at any time and once admitted may begin taking classes the next semester.

Curriculum: Students in this track take 43 credit hours. The work can generally be completed in two years or less.

Core Requirements **19 Hours**

HCO 600: Intro to Public Hlth Systems & Pop. Based Hlth Programs	**3**
BST 611: Intermediate Statistical Analysis I	3
BST 612: Intermediate Statistical Analysis II	3
ENH 600: Fundamentals of Environmental Health	3
EPI 600: Introduction to Epidemiology	3
HB 600: Social & Behavioral Sciences Core	3
PUH 695: Integrative Experience	1
SOPH Requirements	**3 Hours**
GRD 727 Writing Reviewing Research	3
Department Track Requirements	**15 Hours**
HCO 601: Health Economics	3
HCO 613: Health Information in Technology & Policy	3
HCO 615: Finance for Health Professionals	3
HCO 620: Health Insurance and Managed Care	3
HCO 670: Social And Ethical Issues in Public Health	3
Choose One of the following	**3 Hours**
HCO 603: Public Health Policy	3
HCO 618: Management Concepts in Public Health	3
HCO 612: Strategic Management*	3
Internship	**3 Hours**
HCO 697: Internship	3
Total Credit Hours	**43 Hours**

MPH in General Theory and Practice

This program is available to students who prefer a generalist background rather than a more specialized track with additional course requirements. The instructional program is formulated by students and their advisors to meet the specific needs of practicing professionals and to provide a broad, interdisciplinary review of public health theory and practice.

General Theory and Practice Learning Objectives

- describe the economic, legal, organization, and political underpinnings of the US health system;
- analyze clinical issues in health care from a public health perspective; and

- describe public health principles and programs.

Admission: Students must meet the general admission requirements for the Master of Public Health degree program. **Only** persons with doctoral level professional degrees and/or five years or more of senior level experience in public health or a closely allied field may apply to this program. Students who have been admitted to medical school also may apply to this program. Applicants with a previously earned doctoral credential may, upon request, be waived from the requirements to submit a GRE score.

Curriculum: In addition to the MPH core which includes the Integrative Experience, students in this program are required to take public health law and public health policy courses, and participate in an Internship. Other electives are chosen to total a minimum of 43 hours. This track can usually be completed within one year.

Core Requirements	**19 Hours**
HCO 600: Intro to Public Hlth Systems & Pop. Based Hlth Programs	3
BST 611: Intermediate Statistical Analysis I	3
BST 612: Intermediate Statistical Analysis II	3
ENH 600: Fundamentals of Environmental Health	3
EPI 600: Introduction to Epidemiology	3
HB 600: Social & Behavioral Sciences Core	3
PUH 695: Integrative Experience	1
SOPH Requirements	**3 Hours**
GRD 727: Writing Reviewing Research	3
Department Track Requirements	**9 Hours**
HCO 601: Health Economics	3
HCO 603: Public Health Policy	3
Internship	**3 Hours**
HCO 697: Internship	3
Electives	**9 Hours**
Total Credit Hours	**43 Hours**

MPH in Health Policy

The MPH in health policy is designed to train policy analysts at the master's level to work in government agencies, voluntary health organizations, local, state, and federal legislative bodies, managed care organizations, private industry, and consulting firms. The quantitative variation emphasize skills appropriate to an active mid-level research career.

Health Policy Learning Objectives

- Understanding of the unique economic features of health markets
- Skill in applying empirical methods of health research

Admission: The track is open to students with a bachelor's degree and strong mathematics preparation. An undergraduate grade point average of a 3.0 on a 4.0 scale and a minimum combined score of 1080 on the verbal and quantitative portions or 146 on both portions of the Graduate Record Examination General Test (GRE) are desirable for admission consideration.

Core Requirements	**19 Hours**
HCO 600: Intro to Public Hlth Systems & Pop. Based Hlth Programs	3
BST 611: Intermediate Statistical Analysis I	3
BST 612: Intermediate Statistical Analysis II	3
ENH 600: Fundamentals of Environmental Health	3
EPI 600: Introduction to Epidemiology	3
HB 600: Social & Behavioral Sciences Core	3
PUH 695: Integrative Experience	1
SOPH Requirements	**3 Hours**
GRD 727 Writing Reviewing Research	3 Hours
Department Track Requirements	**15 Hours**
HCO 601: Health Economics	3
HCO 603 Public Health Policy	3
HCO 687: Empirical Methods for Health Research	3
HCO 691: Modeling and Simulation	3
BST 619: Data Collection & Management	3
Internship	**3 Hours**
HCO 697: Internship	3
Electives	**3 Hours**
Total Credit Hours	**43 Hours**

MPH in Public Health Preparedness Management and Policy

This specialized degree covers all hazards preparedness topics including, event typologies, response organization, leadership and management, hazard and risk assessment policy development and evaluation and risk communication.

Public Health Preparedness Management and Policy Learning Objectives

- Describe the economic, legal, organization, and political underpinnings of the US health system with regard to preparedness;

- Apply principles of management, finance, accounting and strategic planning in health care organizations with regard to preparedness; and
- Apply basic planning and management skills as well as risk assessment policy development and evaluation and risk communication necessary with regard to preparedness

Admission: Applicants must meet the general admission requirements for the Master of Pubic Health degree program. Applicants with a previously earned doctoral degree may be waived from the requirement to submit a GRE score. Students may apply for admission to this program at any time and once admitted may begin taking classes the next semester.

Curriculum: Students in this track take 46 credit hours. The work can generally be completed in two years. All of the required courses for this program are offered on weeknights.

Core Requirements	**19 Hours**
HCO 600: Intro to Public Health Systems & Pop. Based Hlth Programs	3
BST 611: Intermediate Statistical Analysis I	3
BST 612: Intermediate Statistical Analysis II	3
ENH 600: Fundamentals of Environmental Health	3
EPI 600: Introduction to Epidemiology	3
HB 600: Social & Behavioral Sciences Core	3
PUH 695: Integrative Experience	1
SOPH Requirements	**3 Hours**
GRD 727 Writing Reviewing Research	3
Department Track Requirements	**21 Hours**
HCO 640: Disaster and Emergency Management	3
HCO 641: Public Health Preparedness and Response Policy**	3
HCO 643: Emergency Prepardeness Exercises, Evaluation and Communication	3
HCO 670: Social and Ethical Issues in Public Health	3
HCO 698: Master 's Directed Research	3
ENH 610: Environmental Disasters*	3
EPI 605: Epidemiology of Infectious Diseases	3
Internship	**3 Hours**
HCO 697: Internship	3
Total Credit Hours	**46 Hours**

* * Course offered every other year: HCO 641 odd years and ENH 610 even years

MPH in Maternal and Child Health Policy and Leadership

The MPH programs in the maternal and child health concentration are designed to educate individuals who will plan, administer, and evaluate programs in maternal and child health. The programs provide information about the special problems faced by women and children, including children with special health care needs, and their families. The programs develop and integrate skills from maternal and child health, health policy and leadership and demonstrate their application in problem solving and systems development.

Core Requirements	**19 Hours**
HCO 600: Intro to Public Hlth Systems & Pop. Based Hlth Programs	3
BST 611: Intermediate Statistical Analysis I	3
BST 612: Intermediate Statistical Analysis II	3
ENH 600: Fundamentals of Environmental Health	3
EPI 600: Introduction to Epidemiology	3
HB 600: Social & Behavioral Sciences Core	3
PUH 695: Integrative Experience*	1
SOPH Requirements	**3 Hours**
GRD 727 Writing Reviewing Research	3
Department Track Requirements	**15 Hours**
HCO 601: Health Economics	3
HCO 605: Fundamentals of MCH I: Issues, Programs & Policies	3
HCO 606:Fundamentals of MCH II: Application of Essential MCH Skills	3
HCO 618: Management Concepts in Public Health	3
HCO 625: Advanced Leadership in MCH Part I: Introduction to Leadership	3
HCO 626: Advanced Leadership in MCH Part II: Collaborative Leadership and Advocacy	3
HCO 627: Advanced Leadership in MCH Part III: Into the Streets: Leadership Field Experiences	3
Departmental Electives	**6 Hours**
HCO 603: Health Policy	3
HCO 608/708: Reproductive Health	3
HCO 611/712: Child Health and Development	3
HCO 613: Health Information Technology and Policy	3
HCO 615: Public Health Finance	3
HCO 620: Health Insurance	3
HCO 631: Public Health Demography	3
HCO 670: Social and Ethical Issues	3

HCO 672: Perinatal Health: Issues Data and Policies	3
HCO 624: Health Lifestyles for the MCH Populations**	3
Internship	**3 Hours**
Internship	3
Total Credit Hours	**46 Hours**

MSPH in Outcomes Research

The health care field is placing increasing emphasis on the identification and measurement of clinical decision making and cost/utility analysis. Continuing pressure for the development and measurement of both efficient and effective protocols and health care policies is the driving force underlying this emphasis. Increasingly, employers are seeking qualified analysts to study treatment effectiveness. Graduates of this track will work in clinical settings, government agencies, managed care organizations, insurance companies, health associations, pharmaceutical firms, and consulting firms analyzing cost effectiveness, utilization and treatment effectiveness.

Outcomes Research Learning Objectives

- understanding the problems of measurement and decision making in health care
- skill in applying methods of decision making, cost effectiveness analysis, modeling and simulation

Admission: The track is open to students with a bachelor's degree and strong mathematics preparation. An undergraduate grade point average of a 3.0 on a 4.0 scale and a minimum combined score of 1080 on the verbal and quantitative portions of the Graduate Record Examination General Test (GRE) is desirable for admission consideration.

Curriculum: Students are required to take a total of 44 credit hours which include nine credit hours of project research.

****** Selected by faculty advisor and student to complete total hours required for degree.

MSPH Core Requirements	**10 Hours**
BST 611: Intermediate Statistical Analysis I	3
BST 612: Intermediate Statistical Analysis II	3
EPI 610: Principles of Epidemiologic Research/Lab	4
Outcomes Research Track	**21 Hours**
HCO 601: Health Economics	3
HCO 621: Clinical Decision Making & Cost Effectiveness Analysis	3

HCO 622: Cost Effectiveness Research Methods	3
HCO 670: Social & Ethical Issues in Public Health	3
HCO 677: Patient Based Outcomes Measurement	3
HCO 687: Emperical Methods for Health Research	3
HCO 691 Modeling & Simulation	3
Electives: Selected by faculty advisor and student to complete total hours required for degree.	**3 Hours**
Elective	3
Masters Level Research	**9 Hours**
HCO 699: Masters Level Project Research	3
HCO 699: Masters Level Project Research	3
HCO 699: Masters Level Project Research	3
Total Credit Hours	**43 Hours**

Students receiving a MSPH are required to complete a 12 1/2 hour WebCT course entitled "Overview of Public Health" by the end of their second semester. Students with prior public health education (coursework in each of the public health core disciplines) or experience (5 years in public health) may be waived from this requirement by permission of the Associate Dean.

Coordinated Master of Public Health/Juris Doctor Program

The department offers a coordinated Master of Public Health and Juris doctor degree program in cooperation with the Cumberland School of Law at Samford University, also located in Birmingham. The purpose of the program is to offer future attorneys exposure to the broad areas of public health.

Coordinated MPH/JD Learning Objectives

- describe the economic, legal, organizational, and political underpinnings of the US health system;
- acquire a health care field concentration for individuals seeking a J.D. degree.

Admission: Students enrolled in this program must be enrolled at the Cumberland School of Law. In order to be admitted to the coordinated programs, a student must have a GPA of 2.5 at the end of the first year of law school. A minimum law school GPA of 2.5 each semester and a minimum 3.0 GPA each term in public health are required for students to continue in the coordinated program. Interested students should contact the Office of Student and Academic Services at the School of Public Health for MPH application materials and Cumberland Law School for J.D. application materials.

Curriculum: The J.D. degree requires 90 semester hours of coursework, and the MPH degree requires 47 semester hours. In the coordinated program, 12 hours of public health courses will be credited toward the J.D. degree, and 13 hours of law courses will be credited toward the MPH degree. A minimum of 32 credit hours must be taken in the School of Public Health.

This is a coordinated dual degree track, and, as such, graduation from one program is contingent on completion of all requirements for graduation from the other program.

Core Requirements	**19 Hours**
HCO 600: Intro to Public Health Systems & Pop. Based Hlth Programs	3
BST 611: Intermediate Statistical Analysis I	3
BST 112: Intermediate Statistical Analysis II	
ENH 600: Fundamentals of Environmental Health	3
EPI 600: Introduction to Epidemiology	3
HB 600: Social & Behavioral Sciences Core	3
PUH 695: Integrative Experience**	1
SOPH Requirements	**3 Hours**
GRD 727 Writing Reviewing Research	3
Department Track Requirements	**6 Hours**
HCO 601: Health Economics	3
HCO 603: Public Health Policy	3
Internship	**3 Hours**
Electives	**3 Hours**
Transfer of Credit For Following Law School Courses*	**13 Hours**
Law 502: Torts	4
Law 506: Contract I	3
Law 507: Contracts II	2
Law 526: Business Organizations	4
Total Credit Hours	**47 Hours**

*** The courses must have at least a grade of "B" to be eligible for transfer.**

** Must enroll in graduating semester.

Coordinated Master of Public Health/Master of Business Administration Program

This program's purpose is to provide students without relevant advanced degrees and/or without previous public health experience with those skills necessary for advanced positions in health management. Also, students with experience and/or a relevant advanced degree who wish to pursue a health management credential with broad applicability should seriously consider this coordinated program.

Coordinated MPH/MBA Learning Objectives

- describe the economic, legal, organizational, and political underpinnings of the US health system;
- apply the principles of management and strategic planning in health care organizations;
- apply skills necessary for advanced positions in health management;
- demonstrate leadership skills necessary for managing a health care organization;
- apply finance, accounting, marketing, planning and management skills necessary for successful administration of health care organizations; and
- acquire a health care field concentration for individuals seeking a Master of Business Administration degree.

Admission: Students admitted to this program will have at least a bachelor's degree. Students are admitted separately to the MPH and MBA programs. The School of Business should be contacted for MBA application materials and the School of Public Health should be contacted for MPH application materials. The GRE will be accepted in lieu GMAT. An undergraduate calculus course is also required for admission. If an applicant does not meet this requirement additional information can be found at MBA Admission website http://www.uab.edu/business/degrees-certificates/mba/mba-admission.

Curriculum: Students in this track complete the MPH core (17 credit hours) which includes an Integrative Experience, as well as 4 credit hours of SOPH requirements and 15 credit hours of additional HCO courses, including a 3 credit hour Internship and 36-39 credit hours of MBA courses, for a total of at least 75 credit hours. The work can be completed in two to three academic years.

This is a coordinated dual degree track, and, as such, graduation from one program is contingent on completion of all requirements for graduation from the other program.

Core Requirements	**19 Hours**
HCO 600: Intro to Public Health Systems & Pop. Based Hlth Programs	3
BST 611: Intermediate Statistical Analysis I	3
BST 612: Intermediate Statistical Analysis II	3
ENH 600: Fundamentals of Environmental Health	3
EPI 600: Introduction to Epidemiology	3
HB 600: Social & Behavioral Sciences Core	3
PUH 695: Integrative Experience*	1
SOPH Requirements	**3 Hours**
GRD 727 Writing Reviewing Research	3
Department Track Requirements	**12 Hours**
HCO 601: Health Economics	3
HCO 603: Public Health Policy	3

HCO 613: Health Information Technology and Policy	3
HCO 620: Health Insurance and Managed Care	3
Internship	**3 Hours**
HCO 697: Internship	3
Electives	**3 Hours**
MBA Track Requirements	**33-36 Hours**
MBA 609: Financial Accounting for Managers*	3
MBA 610: Financial Analysis & Reporting for Management	3
MBA 611: Management Information Systems	3
MBA 620: Corporate Finance	3
MBA 630: Social, Ethical & Legal Environment	3
MBA 632: Managerial Process and Organizational Behavior	3
MBA 633: Production & Operations Management	3
MBA 634: Business Strategy	3
MBA 641: Macroeconomic Analysis & Decision Making	3
MBA 650: Modern Marketing Concepts	3
MBA 651: Seminar in Marketing Policy	3
MBA 661: Decision Science or Quantitative Methods II	3
One of the following:	**3 Hours**
MBA 624: Global Financial Management	3
MBA 635: International Business Policy	3
MBA 654: International Marketing	3
Total Credit Hours Earned for Degree	**76-79 Hours**

* Must enroll in the final graduating semester

* MBA 609 may be waived if six or more credit hours of financial accounting was taken as an undergraduate and received a grade of B or better.

Coordinated Master of Public Health/Doctor of Optometry Program

Vision disorders and eye diseases are major public health problems, both nationally and internationally. Optometrists with training and experience in public health are needed to assess community needs for vision care services, to determine which factors contribute to treatment and prevention of visual system anomalies, to develop and apply

quality assurance systems, to participate and provide leadership in health-related agencies, and to foster public awareness of the need for vision care. An individual qualified both in optometry and public health is expected to have the capability to develop, administer, and evaluate eye and vision health programs in research projects; design and conduct epidemiological field studies; use statistical methods in data analysis of case-control and cohort studies; develop and implement vision health education programs; and develop occupational health and eye safety programs.

Coordinated MPH/OD Learning Objectives

- Describe the economic, legal organizational and political underpinnings of the US health system;
- Acquire a public health field concentration for individuals seeking a doctor of optometry degree; and
- Apply population-based sciences and methods of public health as they relate to vision and vision disorders.

Admission: Applicants to the concurrent MPH/OD program must meet the following requirements: enrollment and good standing in the School of Optometry, interview by MPH/OD committee in the School of Optometry, approval and recommendation by the dean of the School of Optometry, and apply and be accepted for admission to the School of Public Health.

Curriculum: Students in the concurrent MPH/OD program are expected to complete the curriculum of the optometry professional program, and a total of 45 credit hours in the MPH program. Work in the public health program can be completed over a four-year period, including summers. Students may begin their MPH program in the summer prior to their entering the Optometry professional program.

This is a coordinated, dual degree track, and, as such, graduation from one program is contingent upon completion of all requirements for graduation from the other program.

Core Requirements	**19 Hours**
HCO 600: Intro to Public Health Systems & Pop. Based Hlth Programs	3
BST 611: Intermediate Statistical Analysis I	3
BST 612: Intermediate Statistical Analysis II	3
ENH 600: Fundamentals of Environmental Health	3
EPI 600: Introduction to Epidemiology	3
HB 600: Social & Behavioral Sciences Core	3
PUH 695: Integrative Experience	1
SOPH Requirements	**3 Hours**
GRD 727 Writing Reviewing Research	3
Department Track Requirements	**3 Hours**
HCO 601: Health Economics	3
HCO 603: Public Health Policy	3
HCO 686: Integrative Health Policy Analysis	3

Total Credit Hours	**46 Hours**

Coordinated Master of Public Health/Master of Public Administration Program

The MPH/MPA degree program provides students with the knowledge base of public health and the skills required to work effectively in a responsible, administrative position in the public sector. Through this coordinated degree program, students in the MPH program can satisfy some of their requirements through courses in the MPA program and vice versa.

Coordinated MPH/MPA Learning Objectives

- describe the economic, legal, organizational, and political underpinnings of the US health system (both tracks);
- apply skills required to work effectively in an administrative position in the government sector based on public health principles and programs (both tracks;
- apply the principles of management and strategic planning in health care organizations (management track);
- apply basic planning and management skills necessary for administration of health care organizations (management track);
- critically evaluate health policy research studies and resulting recommendations (policy track); and
- design and implement health policy studies and draw appropriate conclusions (policy track).

Admission: Students entering this program must meet the minimum requirements for admission into the School of Public health. The student must apply to and be admitted to both programs. The graduate School should be contacted for MPA application materials and the School of Public Health should be contacted for MPH application materials.

Curriculum: The MPH/MPA program requires the satisfactory completion of 56-60 credit hours. Students must complete both MPH and MPA core requirements. Students may choose either of two program options - health policy analysis or management. It is anticipated that a full-time student can complete the dual curriculum in two years. Part-time students may take up to five years to complete their studies. This is a coordinated dual degree track, and, as such, graduation from one program is contingent upon completion of all requirements for graduation from the other program.

Core Requirements	**16-19 Hours**
HCO 600: Intro to Public Health Systems & Pop. Based Hlth Programs	3
BST 611: Intermediate Statistical Analysis I	3
BST 612: Intermediate Statistical Analysis II	3
~OR~	
MPA 607 Statistical Analysis*	3
EPI 600: Introduction to Epidemiology	3
EPI 600: Introduction to Epidemiology	3
ENH 600: Fundamentals of Environmental Health	3
HB 600: Social & Behavioral Sciences Core	3
PUH 695: Integrative Experience	1

SOPH Requirements	**3 Hours**
GRD 727 Reviewing Research or MPA 690 Community Health Mapping**	3
MPA Core Requirements	**27 Hours**
HCO 600: Administrative Ethics	3
MPA 601: The Public Policymaking Process	3
MPA 602: Administrative Theory and Behavior	3
MPA 603: Public and Nonprofit Budgeting	3
MPA 604: Human Resource Management	3
MPA 605: Information Technology in Government	3
MPA 606: Research Design	3
MPA 674: GIS Managers	3
MPA 697: Capstone Project/Graduation Research	3
Internship	**3 Hours**
HCO 697: Internship	3
Health Policy Analysis/ Management Options	**12 Hours**
HCO 601: Health Economics	3
HCO 603: Public Health Policy	3
HCO 612: Strategic Management in Health Programs	3
HCO 620: Health Insurance and Managed Care	3
HCO 640: Disaster and Emergency Management	3
HCO 641: Public Health Preparedness and Response Policy	3
HCO 643: Communication Issues in Disaster Preparedness	3
HCO 686: Integrative Health Policy Analysis	3
Total Credit Hours	**61-64 Hours**

*Can be waived with prior experience; If waived, student must complete an additional 3 credit hour graduate level elective.

*** May use MPA 607 as course substitute; MPA 607 has a pre-requisite; MPA 606: Research Design. Can be waived with prior experience; if waived, student must complete an additional 3 hour graduate level elective.**

*****All MPH students are required to take the writing assessment; students who waive out will be advised to take MPA 690 *** If waived by the MPA program because of student's non-profit or public agency experience, an additional 3 credit MPH course must be taken, and the request for waiver of the MPH internship must be completed.***

Coordinated Master of Science in Public Health /Doctor of Philosophy (Psychology)

The department offers coordinated Master of Science in Public Health and PhD degrees in cooperation with the Department of Psychology at the University of Alabama at Birmingham or at the University of Alabama (Tuscaloosa).

Coordinated MSPH/PhD (Psychology) Learning Objectives

- describe the economic, legal, organizational, and political underpinnings of the US health system;
- apply theoretical principles of health economics;
- apply analytic skills necessary to assess the outcomes of medical interventions and population - based public health programs;
- critically evaluate health policy research and outcomes research studies and resulting recommendations; and
- design and implement health policy and outcomes research studies and draw appropriate conclusions.

Admission: To be considered for this program, students must first be admitted to the PhD program in clinical psychology at UAB or in the PhD in psychology at the University of Alabama (Tuscaloosa) Students must meet the admission criteria for the School of Public Health and remain in good standing in their PhD program.

Curriculum: The MSPH degree requires a minimum of 43 hours. Students in this coordinated program will be waived from the biostatistics requirement upon documentation of successful completion of Advanced Statistics I and II in the PhD program. This is a coordinated dual degree track, and, as such, graduation from one program is contingent on completion of all requirements for graduation from the other program. Students may emphasize health policy issues or outcomes research issues through six hours of approved electives. In addition, all students must complete a nine credit hour research project.

MSPH Core Requirements	**9 Hours**
BST 611: Intermediate Statistical Analysis I	3
BST 612: Intermediate Statistical Analysis II	3
EPI 610: Principles of Epidemiologic Research/Lab	3
PhD Track	**21 Hours**
HCO 601: Health Economics	3
HCO 670: Social & Ethical Issues in Public Health	3
HCO 687: Emperical Methods for Health Research	3
HCO 677: Patient Based Outcomes Measurement	3
HCO 691: Modeling & Simulation	3
HCO 721: Clinical Decision Making & Cost Effectiveness Analysis	3
HCO 722: Cost Effectiveness Research Methods	3
Electives: Selected by faculty advisor and student to complete total hours required for degree.	**3 Hours**

BST 613: Intermediate Statistical Analysis III	3
BST 625: Design and Conduct of Clinical Trials	3
HB 714: Survey Research Methods	3
HCO 675: Improving Quality & Outcomes	3
HCO 680: Aging Policy	3
HCO 694: Special Problems in Policy Anlaysis	3
Masters Level Research	**9 Hours**
HCO 699: Masters Level Project Research	3
HCO 699: Masters Level Project Research	3
HCO 699: Masters Level Project Research	3
Total Credit Hours	**42 Hours**

* Selected by faculty advisor and student to complete total hours required for degree.

Students receiving a MSPH are required to complete a 12 1/2 hour WebCT course entitled "Overview of Public Health" by the end of their second semester. Students with prior public health education (coursework in each of the public health core disciplines) or experience (5 years in public health) may be waived from this requirement by permission of the Associate Dean.

Coordinated Master of Public Health in Maternal and Child Health/Master of Science in Nursing

The coordinated MPH/MSN degree is designed to address the dynamic health care needs of women and children. This program prepares nurse practitioners to participate in the development, implementation, and evaluation of innovative maternal and child health (MCH) programs and policies. This dual degree builds on the synergy generated through two complementary curriculum tracks. In this educational experience, advanced clinical skill is combined with expertise in program planning and evaluation.

Admissions: Students are admitted separately to the MPH and MSN degree programs and must meet admission requirements in both the School of Public Health and the School of Nursing at UAB.

MPH/MSN Learning Objectives

- describe the health problems faced by children and their families within the context of public health;
- apply current policies and programs directed at children and their families and describe how they are developed
- demonstrate skill in providing clinical services to children and their families;
- plan, implement, and administer MCH programs;
- demonstrate skill in the provision of primary care that includes health promotion and prevention of specific disorders and injury;
- demonstrate early identification and treatment or referral for treatment of health problems; and
- manage chronic conditions to avoid complications and promote optimal physical, psychological, and social functioning.

Curriculum: The coordinated MPH/MSN degree can be completed in two years of full-time study. Students may select a focus in the nursing curriculum in either of three tracks: Nursing and Health Systems Administration, or Nurse Practitioner or Clinical Nurse Specialist, or Quality and Outcomes Management in Health Systems. At the completion of the coordinated degree, nurse practitioner graduates are eligible to take the certification examination for pediatric nurse practitioner, family nurse practitioner, or women's health nurse practitioner, depending on the specialty course of study.

MCH Policy & Leadership Concentration- MPH/MSN Dual Degree Program

Core Requirements	**19 Hours**
HCO 600: Intro to Public Health	3
BST 611: Intermediate Statistical Analysis I	3
BST 612: Intermediate Statistical Analysis II	3
ENH 600: Fundamentals of Environmental Health	3
EPI 600: Introduction to Epidemiology	3
HB 600: Social & Behavioral Science Core	3
PUH 695: Integrative Experience	1
SOPH Requirements	**3 Hours**
GDR727 Writing Reviewing Research	3
Department Track Requirements	**15 Hours**
HCO 601: Health Economics	3
HCO 605: Fundamentals of MCH I: Issues, Programs & Policies	s
HCO 606:Fundamentals of MCH II: Application of Essential MCH Skills	3
HCO 618: Management Concepts in Public Health	3
HCO 625: Advanced Leadership in MCH Part I: Introduction to Leadership	3
HCO 626: Advanced Leadership in MCH Part II: Collaborative Leadership and Advocacy	3
HCO 627: Advanced Leadership in MCH Part III: Into the Streets: Leadership Field Experiences*	3
Internship	**3 Hours**
HCO 697: Internship	3
Selectives that are shared with School of Nursing - to complete total hours required for degree	**6 Hours**
NUR 602Q: Issues Affecting Adv Nursing Practice	3
NUR 612: Advanced Pathophysiology	3
Total Credit Hours	**46 Hours**

*** This course is required for all three nursing tracks in the dual degree program.**
**** This course is required only for the Nurse Practitioner or Clinical Nurse Specialist nursing tracks in the dual degree program.**
***** See the School of Nursing Catalog for requirements for the MSN portion of the dual MPH/MSN program.**

Coordinated Master of Public Health/Master of Social Work (with Maternal and Child Health Concentration)

The MPH/MSW degree program is coordinated between the School of Social Work at the University of Alabama (MSW) and the Department of Health Care Organization and Policy (HCOP). The coordinated program prepares social workers for interdisciplinary practice in public health programs concerned with the promotion and improvement of the health of diverse populations, including women, children, and families. Students who have been admitted to the MSW program in the School of Social Work and wish to pursue the coordinated degree option should contact the Department of Health Care Organization and Policy. Students will attend classes in Tuscaloosa and Birmingham.

Admissions: Students who choose the coordinated degree plan will be required to first secure admission to the University of Alabama (Tuscaloosa) School of Social Work (for the MSW) and, at the end of the first semester, to apply separately to the Department of Health Care Organization and Policy (for the MPH). Acceptance in the MSW program does not automatically insure acceptance into the MPH program and vice versa.

MPH/MSW Learning Objectives

- describe the health problems faced by children and their families within the context of public health;
- apply the tools of biostatistics and epidemiology to analyze problems faced by children and their families;
- apply current policies and programs directed at children and their families and describe how they are developed;
- plan, implement, and administer MCH programs;
- demonstrate a solid foundation in both social work and public health principles and skills necessary for individuals interested in leadership positions at the community, state and national levels.

Curriculum: The coordinated MPH/MSW degree can be completed in two academic years (including two summers) of full-time study. Students in the coordinated program will complete courses in the MCH Policy & Leadership Concentration program in Health Care Organization and Policy.

Core Requirements	**19 Hours**
HCO 600: Introduction to Public Health	3
BST 611: Intermediate Statistical Analysis I	3
BST 612: Intermediate Statistical Analysis II	3
ENH 600: Fundamentals of Environmental Health	3
EPI 600: Introduction to Epidemiology	3
HB 600: Social & Behavioral Sciences Core	3

PUH 695: Integrative Experience*	1
SOPH Requirements	**3 Hours**
GRD 727: Writing Reviewing Research	3
Department Track Requirements	**15 Hours**
HCO 601: Health Economics	3
HCO 605: Fundamentals of MCH I: Issues, Programs & Policies	3
HCO 606:Fundamentals of MCH II: Applications of Essential MCH Skills	3
HCO 612: Strategic Management in Public Health	3
HCO 619: Social Work in Public Health	3
Social Work course to be counted toward total MPH hours	3
SW 510: Human Behavior in Social Environments (take at UA)	3
Internship	**3 Hours**
HCO 697: Internship	**3 Hours**
Total Credit Hours	**43 Hours**

* Should be completed in graduating semester

Doctor of Public Health in Health Care Organization and Policy (DrPH)

The DrPH degree is the highest professional degree in public health. The DrPH Program in HCOP develops leaders and research faculty who have proficiency in data analysis, management, critical thinking, teaching, and translating research into policy and practice. Students will be exposed to complex practical problems facing public health practitioners and policy-makers. This program, housed within the Department of HCOP has three concentrations (1) Public Health Management, (2) Maternal and Child Health Policy, and (3) Outcomes Research.

Admission Requirements

- An MPH or equivalent degree in public health;
- Applicants with advanced non-public health degrees can be admitted directly into the DrPH program, but must successfully complete the MPH and concentration-specific prerequisite courses.
- Applicants with an MPH or equivalent degree not in their concentration will take the necessary concentration prerequisites only.
- Applicants with only a bachelor's degree but with an exceptional academic record or rich professional experience will be considered. They must be admitted into the MPH program prior to applying to the DrPH program and complete the MPH program before being fully accepted into the DrPH program.
- Experience in public health. Preference to applicants with experience in public health leadership and administration; Applicants must submit GRE scores taken within five years. Both the score and the percentile on each of the verbal, quantitative, and analytical writing sections of the examination will be evaluated. A minimum of 1100 (550 on each of the verbal and quantitative sections) or 156 verbal and 146 quantitative (new GRE score) is expected.

- International applicants whose native language is not English or who did not complete a degree at an English-speaking institution must submit a TOEFL with TWE test score. The minimum acceptable score is: (Paper Based) 550, (Computer Based) 213 and (Internet-Based) 79-80.
- Other aspects of an applicant's record, such as educational achievement, professional experience and clarity of career goals are helpful in determining admissibility.

DrPH Course Requirements

The DrPH program must be completed within seven years. Students who have not successfully completed their comprehensive examinations within five years will be subject to dismissal from the program. A minimum of 42 credit hours, exclusive of HCO courses 793; 796-799, are required to complete the degree. Students will complete at least 15 credit hours of analytical or methodological courses; at least 15 hours of concentration-core courses; and at least 12 hours of any 700-level electives (as approved by advisor). Students must also complete the doctoral seminars (HCO 796) comprehensive examination (HCO 797), practicum (HCO 793), dissertation proposal/protocol development (HCO 798), and dissertation research (HCO 799).

Curriculum:

Below is a general outline for each of the three concentrations available in the DrPH Program.

Concentration:	**Public Health Management**	**Maternal & Child Health Policy**	**Outcomes Research**
MPH Prerequisites (if student has no MPH). These courses do not count toward degree hours	· HCO 600 Introduction to Public Health Systems and Population-Based Health Programs · EPI 600 (or equivalent) Introduction to Epidemiology · ENH 600 Fundamentals of Environmental Health Sciences · HB 600 Social and Behavioral Science Core · BST 611/BST 612 Intermediate Statistical Analysis I & II PUH 695 Integrative Experience (optional)		
Concentration Prerequisites: (These courses do not count toward degree hours)	HCO 601: Health Economics HCO 603: Public Health Policy HCO 670: Social and Ethical Issues in Public Health HCO 720: Health Insurance and Managed Care HCO 686: Integrative Policy Analysis	HCO 601: Health Economics HCO 605: Funds of MCH I HCO 606: Funds. of MCH II HCO 618: Management Concepts in Public Health · HCO 625: Advanced Leadership in MCH Part I HCO 626: Advanced Leadership in MCH Part II	HCO 601: Health Economics HCO 670: Social & Ethical Issues in Public Health HCO 720: Health Insurance and Managed Care
Concentration Core	HCO 715: Finance for Health Professionals HCO 718: Mgt of Concepts in Public Health Programs AH 715: Research Organizational Theory HCO 706: Strategic Mangt & Theory HCO 713: Health Information Technology and Policy	HCO 703: Public Health Policy HCO 708: Reproductive Health HCO 711: Child Health & Develp. HCO 713: Health IT policy & Mgt HCO 772: Perinatal Health: Issues, Data and Policies	HCO 721: Clinical Decision-making & Cost Effectiveness HCO 722: Cost-Effectiveness Research HCO 777: Patient-Based Outcomes Measurement HCO 791: Modeling & Simulation Elective methods course of 700 as approved by advisor
Methods Core	· BST 613: Intermediate Stats III (3) · HCO 781: Research Organization Theory (3) · · HCO 787: Empirical Methods for Health Research (3) · HCO 788: Longitudinal Methods in Health Sciences Research (3) Elective Methods Course 700 Level as approved by advisor (3)		
Electives	Electives (12 credit hours required), at the 700-level, may be selected from the previously listed courses, from other School of Public Health courses, or from anywhere within the university with advisor approval.		
Doctoral Seminar (credit hours do not count toward degree hours)	HCO 796: 1 credit hour in each Fall and Spring semester (first two years only)		

Other	· HCO 793: DrPH Practicum (6) · HCO 797: Directed Readings for DrPH Comprehensive Exam in HCOP · HCO 798: Dissertation Protocol Development in HCOP · HCO 799: Dissertation Research

For more information please contact, Dr. Nir Menachemi, PhD, Director of the Doctoral Program or Brenda Campbell, Program Coordinator.

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded with an asterisk indicate courses that can be repeated for credit, with stated stipulations.

Health Care Organization and Policy (HCO)

HCO 600. Introduction to Public Health Systems and Population –Based Health Programs- This course presents selected information, concepts, and methods from the field of public health. Topics concerning the structure, financing and current status of the US health care system, as well as the history, organization, financing, and services of the public health system are discussed. All topics are presented from a population-based perspective. 3 hours (Rucks, Wingate, Mennemeyer)

HCO 601/701. Health Economics- Economics as systematic way of thinking about use of resources. Tools of economics applied to issues of organization, delivery, financing, and outcome of health care. Develops economic principles and describes system of health care financing and delivery in the United States, providing basis for analyzing health management and policy options. With didactic coursework provided in HCO 601, doctoral students prepare a major paper under instructor's direction. 3 hours (Sen, Becker, Mennemeyer)

HCO 603/703. Public Health Policy- Theoretical framework and concepts used to understand evolution of public health policies and processes of policy formulation, implementation, and change. Significance of health policy for public health practical foundation of knowledge and skills useful in analyzing and responding to policy environment. Doctoral students will have an emphasis on independent analysis of health policy issues. 3 hours (Becker)

HCO 605. Fundamentals of Maternal and Child Health (MCH) Part I: Issues, Programs & Policies- Provides students with knowledge about current MCH health, social, economic, and environmental issues; programs and policies for women of reproductive age, infants, and children. Required for the MPH degree in the Department of Health Care Organization and Policy's MCH Policy and Leadership concentration. 4 hours (Wingate)

HCO 606. Fundamentals of Maternal and Child Health (MCH) Part II: Application of Essential MCH Skills- The purpose of this course is to introduce students to basic research methods used by public health professional practitioners, with a specific focus on their application in the MCH field; 2) to

introduce the needs assessment and program planning, implementation and evaluation processes specifically elate to public health; and 3) to provide practical educational experiences to develop skills in applying research methods and essential skills needed to conduct needs assessments and use the information gathered to plan, and evaluate public health programs and impact public health policies. 3 hours (Preskitt)

HCO 608/708. **Reproductive Health**- Examines key areas of reproductive health including contraception and family planning, sexual health and sexually transmitted diseases, unwanted pregnancies, health pregnancy and safe motherhood, and adolescent reproductive health. Content addresses measurement, prevalence, determinants and consequences of reproductive health problems; issues of survey design, research methods, and analysis; and development, implementation, and evaluation of reproductive health policies and services to low-to middle-income. 3 hours (Kulczycki)

HCO 611/711. Child Health and Development: Womb to Young Adulthood- Focuses on the key developmental processes that influence health outcomes from the prenatal period through early childbearing years. Processes and outcomes are linked to MCH programs, policies, resources, and barriers relevant to these populations. 3 hours (Mulvihill)

HCO 612. Strategic Management in Health Programs- Provides a framework for strategic management in health care and public health organizations and provides opportunities to develop strategic plans for health care organization. Objectives are: to relate prior knowledge and experience to specific problem-solving situations; encourage strategic thinking in decision making in health care organizations; provide opportunities to engage in and manage a group decision-making process; gain experience in analyzing the public health environment and prepare a strategic plan for that environment; and develop implementation plans to accomplish strategic plans. 3 hours (Ginter)

HCO 613/713. Health Information Technology and Policy- The overall goal of the course is to familiarize students with current issues associated with health information technology (IT) and their impact on the U.S. healthcare system. Health IT applications (e.g., electronic health records, computerized physician order entry systems, decision support systems, health information exchanges, etc.) are playing an increasingly important role in the efficiency and effectiveness of healthcare delivery and management. 3 hours (Menachemi)

HCO 615/715. Finance for Health Professionals- Financial management of public health care organizations. Emphasis on time value on money, capital raising methods, cost of capital, capital budgeting methods and working capital policy. Problem-solving orientation with applications to public health issues. 3 hours (Rucks)

HCO 618/718. Management Concepts in Public Health Programs- Organization structure, management, finance and budgeting, human resources, contracts, negotiation, and operations research in public health settings. Presentation of general principles combined with study of actual cases from practice. Prerequisite: Permission of Instructor 3 hours (Duncan)

HCO 619. Social Work in Public Health- Introduction and overview of the field of public health and the subspecialty of public health social work. Provides information about practical macro-level skills and

increases the knowledge of students regarding the role and functions of advanced-trained social workers within major public health programs. 3 hours (Hitchcock)

HCO 620/720. Health Insurance and Managed Care- Insurance as mechanism for dealing with consequences of an uncertain world. Health insurance and its consequences as significant reasons health care markets differ from others. Workings of insurance markets and current policy issues. Demand for health insurance, underwriting, rate making, moral hazard and adverse selection, HMOs and PPOs, employer health benefits and self insurance, Medicare and Medicaid, long term care insurance and catastrophic coverage. Prerequisite: HCO 601 or equivalent. 3 hours (Morrisey)

HCO 621/721. Clinical Decision Making and Cost-Effectiveness Analysis- The objectives of this course are to acquaint public health and other professionals with techniques of decision making under conditions of uncertainty and the basics of cost-effectiveness analysis. Topics include decision analysis, Markov processes, Monte Carlo simulation, valuing diagnostic tests, and measuring the costs and outcomes of health service programs. Students who successfully complete the course will be able to understand the strengths and limitations of these types of analysis and determine the relevance of research findings to their on areas of expertise. Prerequisite: HCO 601,BST 611, BST 612, or Permission of instructor. 3 hours. (Kilgore)

HCO 622/722. Cost-Effectiveness Research Methods- The objective of this course is to familiarize students with the design and implementation of cost-effectiveness and cost-benefit analysis. Specific topics include cost estimation, effectiveness measurement, time preference, uncertainty, ethical issues, valuing health outcomes, and ethical issues in cost-effectiveness research. At the end of the course students will develop and present analysis plans related to their particular fields of practice. Prerequisite: HCO 621 or Permission of instructor. 3 hours. (Kilgore)

HCO 624. MCH Nutrition and Physical Activity for Healthy Lifestyles-This proposed course will look at nutrition and physical activity from the community nutrition and physical activity viewpoint. It will explore nutrition and physical activity in the MCH population and students will become aware of the different public health venues where current interventions are occurring as well as where intervention can occur. This course will help students design an intervention as well as develop a policy paper to support the intervention. Students will learn strategies for promoting healthy lifestyles through improved eating and physical activity behaviors within communities. Focus on the application of community-based planning based on five cornerstones: access, collaboration, science and research, workforce, and communication will be included in this course throughout the semester. 3 hours (Spear)

HCO 625. Advanced Leadership in Maternal and Child Health (MCH) Part I: Introduction to Leadership- The Advanced Leadership in MCH course series is offered as three one-hour courses. For students in the MPH or DrPH programs in the MCH concentration in HCOP, all 3 courses are required. Others students may take individual segments for one hour credit with permission of the instructor. HCO 625 provides students with the leadership skills necessary to work effectively at a community, state or regional level in the capacity of designing and advocating for programs and policies necessary to promote the health of women, children and families. 1 hour (Duncan, Ginter, Mulvihill, Pass)

HCO 626. Advanced Leadership in Maternal and Child Health (MCH) Part II: Collaborative Leadership and Advocacy- Equip students with knowledge and skills needed to provide leadership in the development and delivery of needed programs and policies to promote the health and well being of MCH and other populations. Focus on honing leadership skills beneficial to MCH public health practice. Students are encouraged to challenge the status quo through the analysis of policy-based case studies and researching leadership challenges for MCH programs. Prerequisite HCO 625 or permission of instructor. 1 hour. (Mulvihill, Pass, Rucks)

HCO 627. **Advanced Leadership in Maternal and Child Health (MCH) Part III: Into the Streets: Leadership Field Experience-** Provide students with opportunities to apply the leadership skills necessary to work effectively at a community, state or regional level to design and advocate for programs and policies that promote the health of women, children and families. Includes lectures, small group discussions, exercises, individual project work, and on-line service-learning field-based activities, usually linked to the internship or other field-based experiences. Prerequisite HCO 625 and 626, or permission of instructor. 1 hour (Mulvihill, Wingate)

HCO 628/728. Qualitative and Mixed Methods Research in Public Health- The main purpose of the course is to facilitate the development of knowledge and skills related to conducting qualitative and mixed methods research in public health: with a specific focus on the use of these methods in the maternal and child health, sexual health, and reproductive health fields. This course is designed to familiarize students who have little or no experience in conducting qualitative research with the perspectives, methods, and techniques of a vast tradition of research. The course will cover some of the methods of data collections used in the conduct of qualitative inquiries, the analysis of textual data, the write-up of findings from qualitative studies, and the development of a qualitative research proposals and reports. The main purpose of the bulk of the course is to facilitate the development of knowledge and skills related to conducting qualitative research in public health. A few classes towards the end of the semester will introduce mixed-methods research, in which qualitative and quantitative research methods are combined in a single line of research inquiry. 3 hours (Turan)

HCO 631. Public Health Demography- Focuses on principles of demography (the study of population) as related to public health. Course content covers: the measurement and analysis of fertility, mortality, migration, population size, and composition; sources and evaluation of demographic data, techniques of population projection; and determinants and consequences of population trends and processes, with applications for health and health care. 3 hours (Kulczycki)

HCO 632. Readings in Maternal and Child Health- Critical analysis of literature in focused area of maternal and child health under supervision of faculty member.1-3 hours Pass/Fail

HCO 640/740. Disaster and Emergency Management- This course will provide a concerted look into the realm of disaster and emergency management. Discussions in the course will concentrate on how disaster and emergency management has changed since 9/11 including new legislation and governmental structures. The course will culminate with a look at the roles and responsibilities of the public health system in preparing for and responding to both natural and man-initiated disasters. This course is intended for advanced MPH or doctoral students with an interest in preparedness policy, emergency management, or public health preparedness. Course graded as letter. 3 hours (McCormick)

HCO 641/741. Preparedness and Response Policy- This course will focus on the development of public policy in the U.S. and the evolution of preparedness policy since September 2001. Students should gain both a capacity for framing issues in order to influence policy makers and public discourse and an understanding of how preparedness policy affects the public health system in the U.S. (McCormick)

HCO 642/742. Preparedness and Agriculture- This course presents the potential effects of an animal disease outbreak, whether natural, accidental or deliberate, on the affected communities. Topics covering the prevention and diagnosis of and the response to an animal disease outbreak will be presented. Examples of the interaction of public health with other disciplines will be provided. This course is designed for MPH students with an interest in preparedness policy, emergency management, or public health preparedness. Note: It is preferred that this course is completed during the final year of enrollment; however, any MPH candidate who has completed the entire core curriculum is eligible to enroll in the course. Course graded by letter. 3 hours (Fields)

HCO 643/743. Emergency Preparedness Exercises, Evaluation, and Communication- This course will provide participants with an understanding of Public Health Emergency Preparedness (PHEP), exercise development, and evaluation. During this course you will learn how to identify threats within your community, determine what capabilities are most needed to prepare for and meet these threats, and how to develop and evaluate exorcises to test knowledge, skills and abilities. 3 hours (Hites)

HCO 670. Social and Ethical Issues in Public Health- This class examines situations where public health programs or policies create or become embroiled in social controversies. Topics examined include: the underlying social conflicts involved in these controversies, the nature of the types of groups involved, and the ethical dilemmas that face decision makers in these situations. 3 hours (Bronstein)

HCO 672/772. Perinatal Health: Issues, Data and Policies- This course will focus primarily on perinatal U.S. health problems although examples from international settings will be utilized. Data analyses will focus on U.S. data. Course work includes article critiques; a literature review and presentation; and a final exam. The course will include lectures, discussions, in-class computer sessions and computer assignments. Students will gain information on maternal morbidity and mortality, birth weight, gestational age, fetal growth, and infant mordities (injuries, birth defects, etc.). Students also will learn about data sources for perinatal health issues and be guided through hands-on exercises using SAS and a population-based dataset. The course will culminate with a field-based experience that will illustrate the effects of some adverse perinatal outcomes on children and their families. 3 hours (Wingate)

HCO 675. Improving Health Care Quality Outcomes- Examination of current issues in quality of care and outcomes management. The course includes a review of past and current efforts, tools, and theories of quality assessment, assurance, utilization management, and measuring and improving outcomes. 3 hours (Van Matre)

HCO 677. Patient-Based Outcomes Measurement- Detailed examination of patient-based outcomes measurement in the context of health care delivery systems and health care policy. Topics include: Theories and development of outcome evaluation instruments; disease-specific and generic measures of outcome; utility estimation; mediators and moderators of health outcomes; issues in instrument selection and administration; methods for evaluating outcomes data; and uses of outcomes data. Prerequisites: BST 601, BST 602 or Permission of Instructor. 3 hours (Locher)

HCO 680. Aging Policy- Providing for the physical and economic well-being of the aging population is a continual challenge facing society. The objectives of this course are to develop an understanding of the influence of demographic changes, economic factors, and public policy on the health status and health care of the aging population; investigate the work, retirement, savings, and health insurance decisions facing the elderly; describe the system of health care financing and delivery arrangements for the elderly in the United states and other developing countries. Prerequisites: Basic biostatistics or equivalent. 3 hours (Locher)

HCO 687/787. Empirical Methods for Health Research- The objectives of the course are to provide thorough treatment of simple and multivariate regression models, simple binary dependent variable models, instrumental variables estimators, sample selection and two-part models, and simple panel data models. Course provides students with an opportunity to acquire hands-on software. This course is designed for students who have had limited experience with regression analysis but a working knowledge of simple statistics, probability distributions, and basic calculus. Prerequisite: Upper level undergraduate or graduate course in statistics and probability; basic calculus. 3 hours (Sen)

HCO 691. Policy Analysis: Modeling and Simulation- Training in basic skills necessary to design, test, implement, manage, present, and critique policy analysis in health care sector. Fundamentals of policy research design, and linkage between theory and operation. Various research techniques examined case studies and analyses of secondary data. Emphasis on choosing appropriate analytical strategies for particular policy issues. Data analysis using computers and critical evaluation of technical policy literature. Special topics in econometrics also addressed. Original policy analytic paper required at end of sequence. Prerequisites: HCO 601 or equivalent, BST 600 or higher recommended. 3 hours (Mennemeyer)

HCO 692. Advanced Topics in Health Disparities Research- The primary aim of this course is to engage students in critical thinking about the current paradigms for health care disparities research in the U.S. As a part of this process, students will be challenged to think about the social, political, and economic determinants of health disparities for diverse health care consumers, to identify substantive trends and gaps in the health disparities literature, and to develop an innovative research or policy-oriented strategy for reducing health disparities. A secondary aim of this course is to provide students with a broad overview of health and health care disparities according to race/ethnicity, gender, and health status. The three specific racial/ethnic groups are: African Americans, Hispanic/Latinos, and Asian/Pacific Islanders. The gender classifications include men and women. The health status groupings include persons with chronic health problems (such as diabetes or a mental health condition, e.g., schizophrenia). Course graded by letter. 3 hours (Gary)

HCO 697. Internship- Field experience under joint direction of faculty member and qualified specialist working in selected aspects of public health. Written report specifying activities, products, and outcomes of experience required upon completing the internship. Pass/No Pass.3,6,9 hours

HCO 698. Master's Directed Research, Health Care Organization and Policy- Independent study with guidance of appropriate faculty. Pass/No Pass.1 - 9 hours.

HCO 699. Master's Project Research, Health Care Organization and Policy- Research for project under direction of research project committee. Pass/No Pass.1- 9 hours.

HCO 701/601. Health Economics- Economics as systematic way of thinking about use of resources. Tools of economics applied to issues of organization, delivery, financing, and outcome of health care. Develops economic principles and describes system of health care financing and delivery in the United States, providing basis for analyzing health management and policy options. With didactic coursework provided in HCO 601, doctoral students prepare a major paper under instructor's direction. Prerequisite: BST 601 or equivalent. 3 hours (Sen, Becker, Mennemeyer)

HCO 703/603. Public Health Policy- Theoretical framework and concepts used to understand evolution of public health policies and processes of policy formulation, implementation, and change. Significance of health policy for public health practical foundation of knowledge and skills useful in analyzing and responding to policy environment. Doctoral students will have an emphasis on independent analysis of health policy issues. Prerequisite: HCO 601 or HCO 701 recommended. 3 hours (Becker)

HCO 706. **Strategic Mgt Theory and Research-** The vision for the course is to develop highly competitive (the very best) strategic management major graduates at that doctoral level. Students will be able to compete nationally for academic positions in both health administration programs and business schools. Strategic Management Theory and Research is to provide a forum for the introduction of the concepts and issues of strategic management in order to facilitate their understanding and communications. The mission of the strategic management track is to develop highly qualified strategic management scholars and teachers who are contributing to the field. 3 hours (Menachemi)

HCO 708/608. **Reproductive Health**- Examines key areas of reproductive health including contraception and family planning, sexual health and sexually transmitted diseases, unwanted pregnancies, health pregnancy and safe motherhood, and adolescent reproductive health. Content addresses measurement, prevalence, determinants and consequences of reproductive health problems; issues of survey design, research methods, and analysis; and development, implementation, and evaluation of reproductive health policies and services to low-to middle-income. 3 hours (Kulczycki)

HCO 711/611. Child Health and Development: Womb to Young Adulthood- Focuses on the key developmental processes that influence health outcomes from the prenatal period through early childbearing years. Processes and outcomes are linked to MCH programs, policies, resources, and barriers relevant to these populations. 3 hours (Mulvihill)

HCO 713/613. Health Information Technology and Policy- The overall goal of the course is to familiarize students with current issues associated with health information technology (IT) and their impact on the U.S. healthcare system. Health IT applications (e.g., electronic health records, computerized physician order entry systems, decision support systems, health information exchanges, etc.) are playing an increasingly important role in the efficiency and effectiveness of healthcare delivery and management. 3 hours (Menachemi)

HCO 715/615. Finance for Health Professionals- Financial management of public health care organizations. Emphasis on time value on money, capital raising methods, cost of capital, capital

budgeting methods and working capital policy. Problem-solving orientation with applications to public health issues. 3 hours (Rucks)

HCO 718/618. Management Concepts in Public Health Programs- Organization structure, management, finance and budgeting, human resources, contracts, negotiation, and operations research in public health settings. Presentation of general principles combined with study of actual cases from practice. Prerequisite: Permission of Instructor. 3 hours (Duncan)

HCO 720/620. Health Insurance and Managed Care- Insurance as mechanism for dealing with consequences of an uncertain world. health insurance and its consequences as significant reasons health care markets differ from others. Workings of insurance markets and current policy issues. Demand for health insurance, underwriting, rate making, moral hazard and adverse selection, HMOs and PPOs, employer health benefits and self insurance, Medicare and Medicaid, long term care insurance and catastrophic coverage. Prerequisite: HCO 601 or equivalent. 3 hours (Morrisey)

HCO 721/621. Clinical Decision Making and Cost-Effectiveness Analysis- The objectives of this course are to acquaint public health and other professionals with techniques of decision making under conditions of uncertainty and the basics of cost-effectiveness analysis. Topics include decision analysis, Markov processes, Monte Carlo simulation, valuing diagnostic tests, and measuring the costs and outcomes of health service programs. Students who successfully complete the course will be able to understand the strengths and limitations of these types of analysis and determine the relevance of research findings to their on areas of expertise. Prerequisite: HCO 601,BST 611, BST 612, or Permission of instructor. 3 hours. (Kilgore)

HCO 722/622. Cost-Effectiveness Research Methods- The objective of this course is to familiarize students with the design and implementation of cost-effectiveness and cost-benefit analysis. Specific topics include cost estimation, effectiveness measurement, time preference, uncertainty, ethical issues, valuing health outcomes, and ethical issues in cost-effectiveness research. At the end of the course students will develop and present analysis plans related to their particular fields of practice. Prerequisite: HCO 621 or Permission of instructor. 3 hours. (Kilgore)

HCO 728/628. Qualitative and Mixed Methods Research in Public Health- The main purpose of the course is to facilitate the development of knowledge and skills related to conducting qualitative and mixed methods research in public health: with a specific focus on the use of these methods in the maternal and child health, sexual health, and reproductive health fields. This course is designed to familiarize students who have little or no experience in conducting qualitative research with the perspectives, methods, and techniques of a vast tradition of research. The course will cover some of the methods of data collections used in the conduct of qualitative inquiries, the analysis of textual data, the write-up of findings from qualitative studies, and the development of a qualitative research proposals and reports. The main purpose of the bulk of the course is to facilitate the development of knowledge and skills related to conducting qualitative research in public health. A few classes towards the end of the semester will introduce mixed-methods research, in which qualitative and quantitative research methods are combined in a single line of research inquiry. 3 hours (Turan)

HCO 740/640. Disaster and Emergency Management- This course will provide a concerted look into the realm of disaster and emergency management. Discussions in the course will concentrate on how disaster and emergency management has changed since 9/11 including new legislation and governmental structures. The course will culminate with a look at the roles and responsibilities of the public health system in preparing for and responding to both natural and man-initiated disasters. This course is intended for advanced MPH or doctoral students with an interest in preparedness policy, emergency management, or public health preparedness. Course graded as letter. 3 hours (McCormick)

HCO 741/641. Preparedness and Response Policy- This course will focus on the development of public policy in the U.S. and the evolution of preparedness policy since September 2001. Students should gain both a capacity for framing issues in order to influence policy makers and public discourse and an understanding of how preparedness policy affects the public health system in the U.S. 3 hours (McCormick)

HCO 743/643. Emergency Preparedness Exercises, Evaluation, and Communication- This course will provide participants with an understanding of Public Health Emergency Preparedness (PHEP), exercise development, and evaluation. During this course you will learn how to identify threats within your community, determine what capabilities are most needed to prepare for and meet these threats, and how to develop and evaluate exorcises to test knowledge, skills and abilities. 3 hours (Hites)

HCO 781. Research Methods and Study Design- The course supplements the material covered in HCO 787, with a focus on the sensible application of econometric methods to important topics in health research. The course will begin with an overview of experimental and non-experimental research and the critical distinction between associative and causal relationships. The remainder of the course will focus on the difficulty of identifying causal relationships in non-experimental contexts, and the methods that are commonly used to overcome these challenges. At the end of the semester, students should come away with an improved grasp of the interdisciplinary language of health research and a deeper appreciation of the importance of research design. 3 hours (Becker)

HCO 782, Advanced Causal Inference-Causal Inference- This course involves the methods and thinking one uses to move from associations to cause-and-effect relationships. This course provides and intermediate treatment of econometric and biostatistical methods for causal inference in public health. These methods include propensity scores, econometric selection models and the handling of dynamic treatments (using marginal structural models and structural nested models). Prerequisite HCO 781. 3 hours (Foster)

HCO 787/687. Empirical Methods for Health Research- The objectives of the course are to provide thorough treatment of simple and multivariate regression models, simple binary dependent variable models, instrumental variables estimators, sample selection and two-part models, and simple panel data models. Course provides students with an opportunity to acquire hands-on software. This course is designed for students who have had limited experience with regression analysis but a working knowledge of simple statistics, probability distributions, and basic calculus. Prerequisite: Upper level undergraduate or graduate course in statistics and probability; basic calculus. 3 hours (Sen)

HCO 788. **Longitudinal Methods in Health Services** Research- This course provides an intermediate treatment of econometric and biostatistical methods for longitudinal analyses of data in public health. 3 hours (E. Michael Foster)

HCO 793. DrPH Practicum in HCO- Doctoral students are required to complete a 6 hour practicum working in a public health agency or organization. Students should have passed their comprehensive exam prior to enrolling in HCO 793. Pass/No Pass. 3-6 hours.

HCO 795. Directed Readings for Doctoral Students- Independent study with guidance of appropriate faculty. Pass/No Pass 1-9 hours.

HCO 796. Doctoral Seminar in Health Care Organization and Policy- Through participation in this course, students will be introduced to advanced topics in public health and management research. Students are required to register for the seminar course each fall and spring semester they are enrolled. 1 hour (Menachemi)

HCO 797. Directed Readings for DrPH Comprehensive Exam in Health Care Organization and Policy- Assists students in preparing for the comprehensive exam. Doctoral Students may register in the semester in which they prepare for and take their comprehensive exam. Pass/No Pass. 3 hours

HCO 798. Dissertation Protocol Development in Health Care Organization and Policy- Assists students with their dissertation protocol development. Doctoral Students may register for this course during the period in which they are preparing their doctoral dissertation protocol. Pass/No Pass. 3 hours

HCO 799. Dissertation Research in Health Care Organization and Policy- Research for dissertation under direction of dissertation committee. Pass/No Pass 1-9 hours.

Graduate School Professional Development Program

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Faculty

Nancy G. Abney; TA Training, Teacher Training, English as a Second Language

Julia S. Austin; Program Director, Academic/Research Writing, English as a Second Language, Faculty-Teacher Development, TA Training, Extramural Funding

Alan D. Corbin; Presentation and Discussion Skills, English as a Second Language

Jeffrey Engler; Career Development, Extramural Funding

Jennifer L. Greer; Academic /Research Writing and Publishing, English as a Second Language

Jonghee Shadix; Pronunciation and Intelligibility Training, English as a Second Language

Program Information

These courses and workshops are offered to improve the academic and professional communication skills of graduate students, postdoctoral fellows, and other UAB research staff with the goals of supporting scholarship, research integrity, productivity, effective communication, and the development and refinement of professional skills.

Course Descriptions

Graduate School (GRD)

701. Presentation & Discussion Skills. This course is designed to develop professional communication skills through individual presentations and group evaluations. Topics include the basics of oral presentation (content, organization, and delivery); use of voice and nonverbal communication; and speaking to different audiences. Students' presentations are videotaped and critiqued by their classmates and the instructor. Fall and Spring. 3 credit hours. Pass/No Pass.

704. Specialized Instruction. This individualized course addresses particular writing needs of graduate students currently working on a writing project (theses, dissertations, articles for publication, grant proposals), presentation skills, advanced academic conversations, or pronunciation concerns. Individual or small group instruction. Prerequisite: Permission of program director. Spring, Summer, and Fall. 1 to 5 credit hours. Pass/No Pass.

705. Teaching at the College Level and Beyond. This course provides an overview of many important aspects of teaching at the college level and beyond. Topics include designing a course and writing an effective syllabus, writing learning objectives, enhancing lectures, testing and grading, dealing with challenging students and difficult situations, learning and the brain, and accessing appropriate active learning strategies. Spring. 2 or 3 credit hours. Pass/No Pass.

709. Fellowship Writing. This hand-on workshop takes students through the fellowship or grant writing process from finding funding sources to writing a successful narrative. Topics also include finding the right funding source to match your research topic, the fellowship or grant writing process, the writing and editing process, and effective revisions. Students will prepare a fellowship or grant proposal during the semester. Spring. 3 credit hours. Pass/No Pass.

712. Research Writing and Style. Designed for graduate students and professionals who are currently working on a writing project (e.g., class paper, journal article for publication, or dissertation), this course

teaches professional research writing habits, style, conventions, and practices. Writers' workshop format enables writers to immediately apply lessons and principles to works in progress. Summer. 3 credit hours. Pass/No Pass.

714. Individualized Pronunciation and Intelligibility Instruction. Permission of instructor required. Students in Individualized Instruction will have acquired basic speaking skills in group instruction and are now ready for fine-tuning their language abilities with a pronunciation coach who tailors lessons to their particular needs. The course includes a thorough diagnostic and goal-setting session, followed by one-on-one instruction in the sounds and rhythms of English, including computer-assisted language mapping and techniques used by professional actors. Spring, Summer, and Fall. 3 to 5 credit hours. Pass/No Pass.

715. Preparing TAs to be Effective Teachers. This course prepares teaching assistants to meet the educational needs of undergraduate students by developing effective teaching practices. Topics include preparing to teach, presenting material effectively, handling questions, handling difficult students and situations, leading laboratory sections, and ethical issues related to teaching. Recommendation of department required. Fall. 2 or 3 credit hours. Pass/No Pass.

716. Developing a Teaching Portfolio. This hybrid course guides participants in developing a professional Teaching Portfolio for documenting teaching experience, improving teaching practices, and enhancing job search potential. The web-based curriculum introduces essential elements of the portfolio, provides tools for gathering necessary documentation, and through individual feedback from the instructor, assists participants in drafting a personal *Philosophy of Teaching*, upon which the Portfolio is built. Spring and Summer. 2 credit hours. Pass/No Pass.

717. Principles of Scientific Integrity. This course surveys ethical issues and principles in the practice of science. Among the topics discussed are the nature, extent, and causes of fraud in the sciences; UAB policies on fraud; plagiarism; the responsibilities of authorship and peer review; misrepresentation such as imagine manipulation; NIH policies on data sharing; potential problems raised by the commercialization of research; other issues in collaborative science; and ethical issues involved in animal experimentation and in clinical trials. Fall and Summer. 3 credit hours. Pass/No Pass.

720. Navigating Academia. Speaking and listening course for international graduate students, postdoctoral fellows, and employees seeking to develop and refine the academic English language skills needed to excel in the sometimes *confusing* and challenging U.S. academic environment of graduate school—and beyond. Students will learn strategies for communicating effectively with instructors and advisors, classmates and colleagues, in the classroom or meetings, by telephone or e-mail. Students will

explore the language needed to take advantage of campus and off-campus services. Online course components will promote the development of speaking skills, grammatical accuracy, and pronunciation. Recommended for all entering international graduate students and others who wish to improve their spoken English both in an academic setting and in the wider community. Intermediate through advanced level placements. As requested. 3 credit hours. Pass/No Pass.

721. Academic Interactions. Speaking and listening course for international graduate students, postdoctoral fellows, and employees seeking to develop and further refine the English language skills necessary to interact effectively and confidently when speaking to one person or to a group. Students will discover strategies for handling speaking tasks of increasing complexity, ranging from face-to-face conversations, to small group discussions, to professional presentations. Students will also develop skills for handling challenging interactions, including expressing an opinion, agreeing and disagreeing, and adapting to high stakes situations such as job interviews. Online course components will further promote the development of vocabulary, grammatical accuracy, and pronunciation. Prerequisite: Advanced-level placement, successful completion of GRD 720, or permission of the instructor. Fall, Spring, and Summer. 3 credit hours. Pass/No Pass.

724. Pronunciation and Intelligibility Workshop. This course is for students who have never been exposed to English phonology classes. In this class, students will be introduced to the American intonation patterns, pronunciation of English sounds, and culture related to the language. In addition to the exposure to English phonology, by interacting with peers, students will discover where they stand in terms of English pronunciation. Participation in this workshop will also provide the instructor with ample opportunities to assess students' individual pronunciation needs. Fall and Summer. 3 credit hours. Pass/No Pass.

725. Advanced Pronunciation & Intelligibility Workshop. Prerequisite: GRD 714, or permission of the instructor. This course is for those students who have completed the individualized instruction course or who have the equivalent proficiency of those who have completed. By applying the voice and speech works of actor training, the students will practice speaking in longer stretches without losing the clarity of the message. This course helps students prepare for thesis and dissertation defenses, lecturing, and talks given at professional conferences. Spring. 3 credit hours. Pass/No Pass.

726. Introduction to Research Writing. Designed for 5th Year Master's Program students and entering graduate students who are new to searching, reading, and writing for research journals and other scholarly publications, This course offers small-group instruction, research writing practice, peer review, instructor feedback, and techniques in self-editing. Special accommodations or sections may be offered

for multilingual writers. Spring. 3 credit hours. Pass/No Pass.

727. Writing and Reviewing Research. Designed for graduate students, postdoctoral fellows, and researchers writing research and review papers and projects, this course offers instruction in strategies and techniques, practice, peer review, and instructor feedback. Face-to-face and online sections, with designated sections for Nursing and Public Health graduate students. Fall, Spring, and Summer. 3 credit hours. Pass/No Pass.

728. Professional Writing and Publishing. Designed for graduate students, postdoctoral fellows, and researchers seeking to write and publish professionally, this course includes writing in field, peer review, self-editing, and coaching. Instructor approval required for second-language writers. Fall and Spring. 3 credit hours. Pass/No Pass.

729. Writing a Journal Article in 12 Weeks. Designed for postdoctoral fellows, new scholars, and graduate students writing for graduation or publication, this course offers step-by-step instruction, peer review, instructor feedback, writing group accountability, and techniques for self-editing. Writers must have a "work in progress''—course paper, stalled article, literature review, etc.—to target and revise for publication. Spring. 3 credit hours. Pass/No Pass.

730. Developing Your Professional Image. This course is designed to raise student awareness of their professional image. Students will learn to analyze how others perceive them in professional settings (office, clinic, research laboratory, departmental meeting, conference, business luncheon, business-related social event, or job interview). Students will also learn how to use this knowledge to develop and polish their professional image accordingly (appropriate dress, levels of communication, and deportment). Finally, they will learn to take control of their image and to protect it in a rapidly changing world of new opportunities and potential pitfalls, such as social networking. Spring and Summer. 3 credit hours. Pass/No Pass.

736. Dissertation Strategies. This course is designed for graduate students who are preparing to start a dissertation within the next twelve months. Seminar topics include creating a dissertation committee, developing a timeline, crafting the proposal, outlining the text, and managing the writing and reviewing process. Summer and Fall. 1 credit hour. Pass/No Pass.

737. Successful Dissertation Writing. Prerequisites: GRD 736 and currently writing dissertation proposal or dissertation. This course encourages efficient writing progress according to the stated goals of the writers. Writers will learn specific dissertation writing practices, develop sophisticated peer-editing skills, and provide support for their own writing practice and for that of their classmates.Spring. 3 credit

hours. Pass/No Pass.

Workshops

706. Grants and Fellowships 101: How to Obtain Funding. This workshop provides an introduction to writing grant proposals and fellowship applications. Topics include funding sources, electronic databases, organization and format of proposals and applications, submission and review processes, and guidelines for effective proposal writing. Fall. One-day workshop. 1 credit hour. Pass/No Pass.

707. Presenting Effectively. This workshop examines elements necessary for giving effective professional presentations. Topics include analyzing audience and purpose, adjusting for lay audiences, developing an elevator talk, identifying characteristics of effective delivery in large and small groups, controlling nervousness, and handling questions. Fall. One-day workshop. 1 credit hour. Pass/No Pass.

708. Writing Successfully. This workshop provides an introduction to various aspects of writing in a variety of professional settings. Topics include strategies for efficient composing, overcoming writer's block, developing ethical scholarship practices, writing for the general public, writing for PowerPoint, and editing your own writing. Spring. One-day workshop. 1 credit hour. Pass/No Pass.

710. Career Workshop for Graduate Students. This workshop provides participants with insights into a variety of career fields, inside and outside of academia. Discussion panels are made up of invited speakers from business, government, industry, and academia from across the United States. Spring. One-day workshop. 1 credit hour. Pass/No Pass.

711. Special Topics. This workshop addresses topics of current interest to graduate students. See UAB Class Schedule for offerings. 1 to 3 credit hours. Pass/No Pass.

Graduate Student Handbook
2012-2013

UAB GRADUATE SCHOOL

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University guidelines and updated policies may be found online: www.uab.edu

The UAB Graduate School

The Graduate School administers doctoral programs in 37 areas, post-masters education specialist programs in 8 areas, and master's level programs in 45 areas, with additional programs planned for the future. A particular strength of the school is its many programs that unite different disciplines by crossing departmental and school lines.

As a graduate student, you should expect many challenges as you build upon your previous educational experiences in new and exciting ways. You will find that graduate education has a distinctly different character from that of undergraduate education. You will explore your chosen area of study in greater depth, but you will also be challenged to reach across boundaries and address larger intellectual issues. There will be greater emphasis on originality and the creation of new knowledge.

Our graduates have used the knowledge and intellectual skills acquired in Graduate School to follow a wide variety of professional paths in academia, government, and industry. We encourage you to take full advantage of the resources of this great university to reach your full potential. As you proceed through your graduate study, we hope that you find your horizons widening and that you will leave prepared for a rewarding professional life.

This handbook is designed to provide you with a general reference to the essentials needed for successful navigation through your graduate career. Take time to familiarize yourself with the contents and also with the specific policies of your own graduate program. The Graduate School staff is always available to answer your questions and provide assistance, but you will find that many of your questions about the policies and procedures surrounding important milestones in your graduate career are answered in the pages that follow. The policies that are reprinted here are those that are most pertinent to graduate students. They address specific aspects of academic performance, academic and non-academic conduct, and student responsibilities. UAB students are expected to be familiar with these policies and to abide by them. Failure to do so may impede a student's progress or may result in disciplinary action and, in some cases, dismissal. Other policies printed below address UAB's responsibilities to its students. All policies are subject to revision. Students are advised to consult the UAB Polices and Procedures Library at http://sppublic.ad.uab.edu/policies/Pages/default.aspx for the most current versions of these and other UAB policies.

The Graduate Council

The Graduate Council is comprised of all graduate program directors. The Graduate Council Advisory Committee is a subset of these program directors who have been designated by their school deans to serve in an advisory capacity to the Graduate School Dean. The Graduate Council Advisory Committee has developed policies and procedures to ensure that high standards for graduate study are maintained at UAB. These policies and procedures are available at the Graduate School's Web site (http://www.uab.edu/graduate/graduate-catalog/72-policies-and-procedures).

The Graduate Council Advisory Committee, through consultation with the Dean, is responsible for developing academic requirements and describing these requirements through appropriate policies. The Dean, through consultation with the Graduate Council, is responsible for developing procedures that effectively enforce academic requirements and implement policies.

The Advisory Committee reviews new graduate program or certificate proposals, academic requirements, policies, procedures, and Graduate School activities. The committee recommends and approves appropriate changes. Changes in academic requirements and related policies require a majority vote of the Advisory Committee.

The Graduate Faculty

Graduate faculty membership may be granted by the Dean of the Graduate School to faculty members who demonstrate a high level of competence in teaching and scholarship. Graduate faculty membership is required (a) of all individuals teaching courses for graduate credit and (b) of members of graduate study committees. A complete listing of the graduate faculty can be found on the Graduate School Web site (http://www.uab.edu/graduate/faculty/gradfaclist).

Graduate School Professional Development Program

Through its Professional Development Program, the Graduate School offers courses and workshops designed to help graduate students, postdoctoral fellows, and other academic professionals develop communication and other career-enhancing skills. Current offerings for credit include courses and one- or two-day workshops in writing, funding, presentations, and teaching at the college level. More information and schedules are available at the Professional Development Program's Web site (www.uab.edu/graduate/profdev).

Graduate Degree Programs

Program and Course Information

The online program descriptions (http://www.uab.edu/graduate/graduate-catalog/68-graduate-program-directory) give details of degree requirements beyond the general statements in this handbook. Specific courses are also listed.

Combined Degree Programs

UAB offers students opportunities to pursue two advanced degrees concurrently. These are limited primarily to students pursuing both a research degree (such as the Ph.D. or M.S.) and a professional degree (such as the M.D., D.M.D., O.D., or M.P.H.). Students wishing to be enrolled in two programs concurrently should submit an application to each program. UAB also offers a limited number of 5th year Masters (Fast Track) programs for students who wish to earn both the Bachelors and Masters degree in five years.

Concurrent Degrees

Students who do not qualify for a combined degree program but wish to begin work toward a second advanced degree may earn up to 12 semester hours in the additional program (without special permission) while simultaneously earning credit toward the original degree. However**, no more than 12 semester hours earned in the first degree program may ever be applied toward the second degree.**

Student Organizations and Activities

Graduate students at UAB have many opportunities to become involved in the life of the university. Information about additional groups, both on and off campus, can be found in the UAB Student Handbook, *Direction* at http://www.uab.edu/handbook/

Graduate Student Association

UAB graduate students are represented by the Graduate Student Association (GSA), which works closely with the Graduate School and other offices of the university administration in formulating policies and meeting student needs. All graduate students are automatically members of the GSA, and the GSA Senate is composed of student representatives from the various graduate programs. The GSA provides partial funding for graduate student travel to professional meetings. The organization cosponsors a variety of services and activities, including the Honors Convocation, Graduate Student Research Days, Graduate Student Orientation, and the GSA Emergency Loan Fund. Information on the new Graduate Student Medical Assistance Fund and travel grants may be obtained on the GSA Web site (www.uab.edu/gsa).

Black Graduate Student Association

The Black Graduate Student Association (BGSA) was founded in 1993. The BGSA sponsors social events, informational sessions on topics of interest, community services, and an annual conference. For detailed information about the BGSA, visit the Web site at http://www.uab.edu/bgsa/.

UAB Graduate Career Awareness and Trends (GCAT)

The UAB GCAT, previously called the Industry Roundtable, is sponsored by the UAB Graduate School. The GCAT is a student-initiated and student-run informal discussion group open to all graduate students and dedicated to fostering a greater awareness of career opportunities outside academia.

Its goals are to provide a forum for networking with industry representatives; establish an interface between academia and industry; introduce students to the process of making industry contacts; encourage students to comment, ask questions, and seek advice from nonacademics; stimulate students to begin career development early in their educational experience; and provide information to students about career opportunities outside academe. More information regarding the GCAT can be found at http://main.uab.edu/show.asp?durki=47488.

Graduate Student Research Days

Graduate Student Research Days (GSRD) is an annual competition in which graduate students present their original research in an open forum. Deadlines for submitting abstracts and presentations for GSRD are announced at the beginning of spring semester and are available at the GSRD Web site (www.uab.edu/graduate/researchday). Awards are presented at the Graduate School Awards Luncheon ceremony each spring semester.

General Academic Requirements

Categories of Graduate Student

Two broad categories of graduate students are recognized: degree-seeking and nondegree-seeking.

Degree-Seeking Students

Degree-seeking graduate students are those accepted into a specific graduate program to work toward a specific advanced degree. In addition to the completed online application, the application procedure includes the submission of official transcripts, standardized test scores, and letters of recommendation. Each application is reviewed by the graduate program faculty, who make an admissions recommendation to the Graduate School Dean or a representative of the Graduate Dean.

Nondegree-Seeking Students

The nondegree category serves students who do not wish to pursue a graduate degree at UAB, as well as those who wish to begin graduate study before being admitted to a degree program. Not all graduate courses are open to nondegree-seeking graduate students. Although there is no limit to the number of credit hours that may be earned as a nondegree-

seeking student, should a student later wish to pursue an advanced degree at UAB, the credit earned while in nondegree-seeking status is not automatically acceptable toward the degree**. In no case can more than 12 semester hours earned as a nondegree graduate student be applied toward an advanced degree at UAB**.

Because of U.S. immigration requirements, international applicants (i.e., those who are neither U.S. citizens nor permanent residents) cannot normally be considered for the nondegree category unless already residing in the United States. Immigration laws should be consulted to determine eligibility of international students.

Unless otherwise stated, the policies in this section apply to both degree-seeking and nondegree-seeking graduate students.

Information on applications for admissions can be found on the Graduate School Web site (http://www.uab.edu/graduate/area-3/prospective-students) and in the Graduate Catalog.

Special Conditions of Admission

Admission with Contingencies

Students lacking a limited number of specific qualifications may be admitted to graduate programs contingent on completion of those qualifications within a specified period of time. Students are informed of specific requirements for continued enrollment and the time allowed for completion at the time of admission. Failure to meet the requirements during the stipulated time may result in dismissal.

Admission of Students Previously Dismissed

When any individual applies to a graduate program, a major part of the admissions decision involves an estimate, based on the applicant's academic history, of whether the applicant can perform satisfactorily at the graduate level. To be readmitted, applicants who have previously been dismissed from the Graduate School based on unsatisfactory academic performance must present convincing evidence to the faculty and the Graduate School Dean that a substantial improvement has occurred so that it is probable that the applicant can now perform at the required level in graduate work.

Readmission

The records of students, who have not registered for courses for one year or more, will be removed from the UAB computerized registration system. Such students must apply for readmission before they may register again. Degree-seeking students who (1) were admitted to a UAB Graduate Degree-Seeking Program within the last five years, and (2) have not registered for courses for one academic year (3 semesters) or more BUT have registered for and successfully passed at least one graduate course at UAB after being admitted to a UAB Graduate Degree-Seeking Program, and (3) have not attended any other university or college in the interim, and (4) wish to return to the graduate program to which he or she was earlier admitted, must fill out the Application for Readmission to Graduate Degree Program form and pay the appropriate fee. These readmitted students must meet the degree requirements operative at the time of readmission. Students who wish to return to the nondegree category after an absence of one or more years must submit a new nondegree online application, together with the required processing fee. These forms can be obtained online at http://www.uab.edu/graduate/online-forms.

Faculty

To maintain university accountability, UAB faculty and staff who wish to take occasional graduate courses must register for these courses after admission to the Graduate School in the nondegree-seeking basis. Admission of a UAB faculty member as a degree-seeking graduate student requires the concurrence of the applicant's department chair and dean(s), as well as the approvals required for other applicants to the same program. For more information regarding Educational Assistance, visit the UAB Human Resources Web page at http://www.hrm.uab.edu/main/index.html

Graduate Credit

For purposes of academic accounting, credits expressed in "semester hours" are assigned to each course. The guideline for lecture courses is that one semester hour of credit is awarded for 13-15 contact hours. Laboratory credit is assigned on the basis of one semester hour of credit for approximately 30 hours of work in the laboratory.

Undergraduates Seeking Enrollment

UAB undergraduate students may be allowed to enroll in a graduate course with the approval of their advisor, the course instructor, their undergraduate program director, and the graduate program director. The Undergraduate Student Request for Enrollment in Graduate Level Coursework form can be obtained online (http://www.uab.edu/graduate/online-forms). Credits earned by undergraduate students may be applied to either an undergraduate degree or a graduate degree, but not both. If the student is subsequently admitted to the Graduate School, use of this credit toward a graduate degree requires the approval of the graduate program director and the Graduate School Dean.

Course Numbering System

The scholastic level of UAB courses is indicated by the century number. Courses numbered 500 and above are graduate and post baccalaureate courses. Courses numbered 500-599 are available to upper-level undergraduate and beginning graduate students. Courses numbered 600 and above are for graduate students. Those numbered 600-699 are intended

primarily for students at the master's level, with 698 reserved for nonthesis research and 699 reserved for thesis research. Courses numbered 700-799 are primarily for students at the doctoral level, except in the School of Education where the numbers from 700-729 are reserved for courses leading to the degree of Educational Specialist (Ed.S.). The number 798 is reserved for nondissertation research and 799 for dissertation research. Seminars, practica, individual studies and projects, internships, and residencies will generally carry numbers in the upper range of these centuries.

Time Limitations

Graduate students are generally expected to complete all degree requirements with **5 years of matriculation for master's and 7 years of matriculation for doctoral students**. One extension of these time limits can be requested when mitigating circumstances preclude completion of requirements within 5 years (master's) or 7 years (doctoral). The request for an extension should include a plan and timeline for completion. Such requests require the approval of the student's dissertation committee and graduate program director and must be presented in writing to the Dean of the Graduate School for consideration and approval. Courses taken more than 5 years (master's) or 7 years (doctoral) before graduation may not be applied toward a degree without the approval of the graduate program director and Graduate Dean.

Leave of Academic Absence

A graduate student may request a leave of academic absence. The request for a leave of academic absence may not exceed one (1) academic year. The Request for Leave of Academic Absence form can be found at the Graduate School Web site (http://www.uab.edu/graduate/images/acrobat/forms/leaveofabsence.pdf). The request must be approved by the student's graduate program director and Graduate School Dean. Before a student can return from an approved leave of academic absence, the graduate program director must submit to the Graduate School a request to allow the student to re-enroll in courses.

Course Enrollment

Registration

Students must register for all work to be taken for graduate credit. To be classified as "full-time," a graduate student must register for at least 9 graduate semester hours of work each semester. To be classified as "part-time," a graduate student must register for at least 5 graduate semester hours of work each semester. If you are a degree-seeking student, you must be enrolled at least part-time in order to receive financial aid. The UAB class schedule can be found on the BlazerNET website located at https://blazernet.uab.edu/cp/home/displaylogin. The class schedule lists the courses and other work to be offered and gives full details on prerequisites, registration dates, and procedures.

Adding or Changing Courses

Adding or changing courses after registration is possible each semester until the date specified on BlazerNET. Procedures are also specified.

Withdrawal from Courses

Graduate students are expected to complete courses for which they have registered, unless unusual circumstances require withdrawal. The procedures for withdrawal are specified on BlazerNET. **Mere cessation of class attendance does not constitute withdrawal, either academically or for tuition charges**. If you must withdraw from a class or classes after the Add-Drop period, the withdrawal request must be made no later than the posted date for all withdrawals. Check the Academic Calendar, https://www.uab.edu/students/academics/academic-calendar, for the appropriate semester to verify the last date for withdrawal. If a student follows the procedures to withdraw in BlazerNET, then a grade of "W" will be entered on the transcript.

Credit by Examination

Students may not earn "credit by examination" at the graduate level.

Audits

Graduate students may audit courses available for graduate credit with the permission of the instructor and payment of appropriate fees; this approval must be secured **before registration**. Courses taken for audit credit are not counted toward the hours required for full-time status. Provided the instructor's requirements are met, the course will appear on the transcript with the notation AU. The request to audit form can be obtained online at http://www.uab.edu/graduate/online-forms.

Course Completion

Grading System

The grade of A is used to indicate superior performance, B for adequate performance, and C for performance only minimally adequate for a graduate student. In most programs, a grade of C is a failing grade. Any graduate student completing a course at the 500 level or above with a performance below the C level will receive a grade of F. The Graduate School does not use the grade of D.

Grades in Pass/Not Pass Courses

With the approval of the graduate program director, a course may be designated as a "pass/not pass course." The grade of P (passing) signifies satisfactory work. The grade of NP (not passing) indicates unsatisfactory work, without a penalty being assessed with respect to the grade point

average (GPA). Research courses with course numbers 698, 699, 798, and 799 are considered pass/not pass courses.

Temporary Grade Notations

Temporary notations used by the Graduate School are N for "no grade reported," and I for "incomplete" coursework.

If there is a special circumstance in which an instructor does not submit a grade at the end of a semester, a temporary grade of N will be recorded. If no permanent grade has been reported by the end of the following semester, an F will automatically be entered in the student's academic record.

The temporary notation of I may be reported at the discretion of the instructor to indicate that the student has performed satisfactorily in the course but, due to unforeseen circumstances, has been unable to finish all course requirements. An I is never given to enable a student to raise a deficient grade. This notation should not be used unless there is reasonable certainty that the requirements will be completed during the following semester, because at the end of that semester the I automatically changes to an F if the I has not been replaced with a letter grade. In highly unusual circumstances, the student may request an extension of the time to complete the requirements. This request must be submitted in writing in advance of the time when the grade automatically changes to an F because the approval of the instructor, graduate program director, and Graduate School Dean are all required.

Cumulative Credits and Grade Point Average (GPA)

Semester Hours Earned

The student's "semester hours earned" are increased by (1) earning a grade of C or better in a course for which the student was registered on a regular ("letter grade") basis or (2) obtaining a P grade in a course taken on a pass/not pass basis.

Semester Hours Attempted

The student's "semester hours attempted" are increased by receiving a grade of A, B, C, or F in a course for which the student was registered on a regular basis.

Quality Points

Four quality points are awarded for each semester hour in which an A is earned, three quality points are awarded for each semester hour in which a B is earned, and two quality points are awarded for each semester hour in which a C is earned. No quality points are added for other grades.

Grade Point Average (GPA)

The grade point average is determined by dividing the total quality points awarded by the semester hours attempted.

Repeated Courses

Graduate students may be allowed to repeat courses for graduate credit with the permission of the graduate advisor and graduate program director. All courses taken and all grades earned are permanently recorded on the student's transcript. The first time a student repeats a course, he or she receives the grade earned for the second attempt. If a course is taken three or more times, all grades after the first are counted. **The Graduate School Records Office must be notified of the first repeat at the time of registration because the calculation using the repeat grade is not automatic. Some graduate programs may not allow the Repeated Course policy.** Check with your advisor to make sure your program has a repeat policy. Note: Many graduate programs also base retention decisions on programmatic guidelines and not on grade point average.

Academic Performance

Good Academic Standing

For a student to maintain good academic standing in the Graduate School, a grade point average of at least 3.0 (B average) and overall satisfactory performance on pass/not pass courses are required. Satisfactory performance on pass/not pass courses is defined as earning at least as many hours of P grades as hours of NP grades.

Conditional Dismissal

A degree-seeking or nondegree-seeking graduate student, who has been in good academic standing but who, at the end of any semester, fails to meet the criteria to continue in good academic standing will be placed on probation. Such a student must re-establish good academic standing within the next two semesters of graduate study undertaken. Students who do not accomplish this level of performance will be dismissed from the UAB Graduate School.

The rules stated above govern university probation and dismissal, administered by the Graduate School. Individual graduate programs may establish and administer program probation and dismissal governed by more stringent requirements. In general, a student's retention in a specific graduate program is contingent on the faculty's belief that the student is likely to complete the program successfully. If the faculty ceases to hold this belief, the student may be dismissed from the program.

UAB Student Record Policy

Federal law guarantees students certain rights with respect to their educational records. It is the student's responsibility to become familiar with the university's stated policies on these rights (i.e., Student Records Policy).

Graduate School Deadlines

All Graduate School deadlines, as indicated on the calendar or in explanation of policies and procedures, unless otherwise stated, are final by **5:00 p.m.** on the date specified, by which time all transactions must be completed and documents received in the Graduate School. Transactions and documents requiring the action or approval of graduate advisors, committee members, instructors, department chairs, academic deans, or others prior to receipt by the Graduate School should be initiated by the appropriate person (student, instructor, graduate advisor, or other) sufficiently in advance of the Graduate School deadline for the required actions to be taken and approvals made or declined before the deadline. Deadline dates are available online at http://www.uab.edu/graduate/deadline-dates.

Responsibilities of the Graduate Assistant or Trainee

A fundamental responsibility of the graduate assistant is to work closely with the faculty supervisor in carrying out research or teaching activities, while at the same time making good progress toward the completion of the degree program. If the student's assistantship responsibilities and academic program are properly coordinated, these responsibilities will be compatible. The assistant should articulate his or her goals early in the term of appointment and work with the supervisor to achieve them. The graduate assistant is obligated at all times to maintain high ethical standards in academic and nonacademic activities, and to report violations of these to the faculty supervisor. The graduate assistant should keep well informed of departmental, school, and institutional regulations, and follow them consistently. If problems arise in the assistantship assignments, the graduate assistant should seek help first from the faculty supervisor. If problems cannot be resolved, the student should consult the Program Director.

In general, graduate assistants are expected to be available in the periods between academic terms. Graduate assistants are entitled to the following short-term leaves:

- A maximum of 15 calendar days (one-half month) paid leave of absence (vacation) per calendar year,
- 3 calendar days paid sick leave of absence per calendar year, and
- Parental leave of absence (with pay) of 30 consecutive days per calendar year upon the birth or adoption of a child. Either or both parents are eligible for parental leave.

These leaves (vacation, sick, parental) do not accrue. All leaves must be requested and require approval by the mentor and graduate program director. With the agreement of the mentor and graduate program director, extended, unpaid, non-emergency absences from campus for periods up to a month may be approved. Extended absences (without pay) for non-academic purposes should be limited. Program policies regarding leaves of absence must apply equitably to all full time students in good standing in the program. Students should consult the Graduate School Policies and Procedures concerning leaves of academic absence. In emergencies, graduate assistants should inform their mentors or program directors as soon as possible about the need for a leave of academic absence. NOTE: Graduate students (Trainees and Assistants) are not eligible for FMLA.

Graduate Level Postbaccalaureate or Post-Master's Certificates

Several UAB graduate programs offer Certificates which do not involve conferral of either a Masters or Doctoral degree. Earning a certificate usually involves taking a specific set of graduate level courses which is designed to provide the Certificate holder expertise in a specialty area of a profession or practice. Certificate programs often consist of 12 or more credits of course work. In some cases the nature of the course work is specified by skill requirements, or may be mandated by State level requirements, for example, by the Alabama State Department of Education.

Certificate requirements vary by discipline. Therefore students should determine what the requirements are of the Certificate program in which they are interested by communicating directly with the program director of the program in which the Certificate is offered.

Requirements for the Master's Degree

Faculty Advisor

Immediately after a degree-seeking student enters the UAB Graduate School, a member of the faculty of the graduate program to which the student has been admitted should be assigned to serve as the student's advisor. The assignment may be a temporary arrangement. The student and the advisor should confer about courses and any special work to be taken on the basis of the student's previous experience and the requirements of the graduate program.

Graduate Study Committee

As soon as possible, a specific plan of study should be developed. Traditionally, graduate study is highly flexible and individualized, and a graduate study committee is appointed, chaired by the student's advisor, to guide the student toward the degree. (Some graduate programs, particularly where flexibility in the course of study is limited by

accreditation and other external constraints, do not always use a graduate study committee for Plan II students.) When used, the committee should consist of at least three Graduate School faculty members, one of whom should be from outside the student's graduate specialization and each of whom should be able to contribute some relevant insight and expertise to guide the student. Recommendations for graduate study committee membership are submitted by the advisor and the student to the graduate program director, who subsequently submits these recommendations to the Graduate School Dean. Committee members must have credentials equal to or exceeding that of the degree that the student is pursuing and must have been approved by the Graduate School Dean for Graduate Faculty status. Graduate faculty appointees and instructions for requesting new appointments are available at http://www.uab.edu/graduate/faculty/gradfaclist. New Graduate Faculty appointments should be requested by the department and approved by the Graduate School Dean prior to being placed on the recommendation to serve as a member of a student committee. Graduate Faculty status definitions are available at http://www.uab.edu/graduate/faculty/definitions-of-graduate-faculty-categories.
Changes to a student's committee must also be submitted on the appropriate form available at http://www.uab.edu/graduate/online-forms.

Plan I or Plan II

The Graduate School recognizes two principal paths, known as Plan I and Plan II, that lead to the master's degree. One or the other of these plans may be appropriate in particular circumstances, and in some programs a choice is available.

Plan I requires the completion, in good academic standing, of at least 24 semester hours of appropriate graduate work and 6 semester hours of thesis research, with the presentation of an acceptable thesis embodying the results of original research work.

Plan II may not require research and does not require a formal thesis, but a minimum of 30 semester hours of appropriate graduate work must be completed in good academic standing. Although thesis research is not required as part of a Plan II course of study, the student is often expected to gain insight into the techniques of problem posing and problem solving and to use these insights to prepare a written report. A plan of study/course curriculum outline is required for all Plan II master's students when submitting the application for degree (before graduation).

Where both Plan I and Plan II are available within the same graduate program, an early and meaningful choice should be made by the student, in close consultation with the advisor. A change in choice of plans requires the approval of the program director and the Graduate School Dean.

Transfer of Credit

Previously earned graduate credit that has not been applied toward another degree (either at UAB or elsewhere) is eligible for transfer into the student's current degree program. Ordinarily no more than 12 semester hours of transfer credit can be applied to a degree program. Acceptance of more than 12 hours will require approval by the program director, department chair, and Graduate School Dean. All credit transfer requests must be initiated by the student and require the approval of the graduate program director and the Graduate School Dean. Transfer of Credit forms are available online at http://www.uab.edu/graduate/online-forms. An application for transfer of credit will not be considered until the student has completed at least 9 semester hours of graduate credit in the current UAB program and is in good academic standing. Once transfer credit has been accepted, it will be included in the calculation of the grade point average in the student's current UAB program.

Graduate credit earned with a grade of B or above while a graduate student in another accredited graduate school may be considered for transfer. In programs offered jointly by UAB and other universities, all graduate credits earned in the program at a cooperating university are eligible for transfer to UAB. If a student earns credit in one UAB graduate program and is later admitted to another program, unused credits from the previous program are eligible for consideration for transfer into the current program.

Additional Program Requirements

In consultation with the faculty, the director of each graduate program will specify any additional requirements, such as a reading knowledge of a foreign language or a working knowledge of statistics, which are considered essential to mastery of the academic discipline. Such requirements become conditions for the completion of the degree. The program may also adopt a system of examinations that the student must pass at various points in the program.

Admission Into Degree Candidacy (Plan I Only)

Admission to candidacy is a formal step recommended by the student's graduate study committee and approved by the graduate program director and the Graduate School Dean, acknowledging that the student has been performing well and is likely to complete the degree. For Plan I students, admission should occur when the student has obtained an adequate background (although not all coursework needs to be complete) and has provided the committee with an acceptable proposal for thesis research. Students must be in good academic standing to be eligible for admission to

candidacy, and admission must take place no later than one semester before the expected graduation. Before being admitted to candidacy, students must complete a Research Compliance Verification form and attach photocopies of the appropriate assurance letters and/or forms. Students must be admitted to candidacy before they can register for thesis research hours (i.e., 699). Forms are available online at http://www.uab.edu/graduate/online-forms.

IRB and IACUC Approval

If the research involves human or animal subjects, approval from the IRB or IACUC must be documented before admission to candidacy can be approved and must be kept current until the research is completed (please refer to the Tip Sheet for Students Involved in Research Involving Human or Animal Subjects located on pages 50 and 51 of this *Handbook*. **The student's name must appear on the IRB approval form**. The IACUC form must display the appropriate research protocol number.

Application for Degree

Each candidate for a master's degree must signify the intention to complete the requirements by a particular graduation date by submitting a completed Application for Degree Form. Because this form is used to document completion of requirements, order the diploma, and to include the student's information in the commencement program, the form must be received in the Graduate School Office **no later than 3 weeks into the semester of expected graduation. However, because each graduate program may have an earlier deadline, the student should check with his or her program office for those deadlines as well.** A plan of study/course curriculum outline is required for all Plan II master's students when submitting the application for degree (before graduation). See deadline dates, http://www.uab.edu/graduate/deadline-dates. Students must be registered during the semester in which degree requirements are completed. If degree candidates are covered by the student health insurance policy, or have student loans, it may be necessary to maintain at least half time registration status of 5 credit hours to retain these benefits. Check with the appropriate office if these are concerns. Forms are available online at http://www.uab.edu/graduate/online-forms.

Thesis

The thesis required under Plan I should present the results of the candidate's original research and the interpretation of those results. The document should also demonstrate the candidate's acquaintance with the literature of the field and the proper selection and execution of research methodology.

Signatures of committee members and program directors on the approval form indicate their assurance that they have examined the document and have found that it is of professional quality from all standpoints, including writing quality, technical correctness, and professional competency, and that the document conforms to acceptable standards of scholarly presentation. The Graduate School is responsible for ensuring that the final version of the thesis meets the physical standards required of a permanent, published document and for adherence to the requirements stated in the UAB Format Manual (available online at http://www.uab.edu/graduate/images/acrobat/forms/theses/FormatManual.pdf).

The final approved version of the thesis must be submitted as a single PDF for final review no later than 2 weeks (10 business days) following the public defense. Master's students must submit the Approval Form, signed by each committee member and the program director. The UAB Publication Agreement form is submitted online. Additional information concerning completing the final steps of the publication process is available online at http://www.uab.edu/graduate/submitting-your-thesis-or-dissertation-to-the-graduate-school.

If in the opinion of more than one member of the thesis committee, the student has failed the thesis defense, there is no consensus to pass. The chair of the committee shall advise the student that the thesis fails to meet the requirements of the program. The chair shall notify the student in writing about the reason(s) for failure. If the student resubmits or submits a new thesis for consideration by his/her graduate program at least two members of the new examining committee shall be drawn from the original committee. If the modified or new thesis fails to meet the requirements of the program, the student shall be dismissed from the graduate program.

In the event that only one of the three committee members dissent, that individual must submit a letter in which he/she outlines the reasons for their dissent to the student's advisor. The advisor and student may then prepare a rebuttal statement that is submitted, along with the letter of dissent, to the advisory or executive committee of the program for review. The advisory committee can then decide to accept or reject the rebuttal statement. If the rebuttal is accepted, the student is passed on his/her thesis defense. If the rebuttal is rejected, the advisory committee can recommend to the student or advisor potential steps necessary to remediate the thesis and potentially also the work therein, or the committee can recommend that the student be dismissed from the program.

Thesis Defense

Under Plan I, the final examination should take the form of a presentation and public defense of the thesis, followed by an examination of the candidate's comprehensive knowledge of the field. The time, date, and location of this examination is reported to

the Graduate School via the online Request for Thesis or Dissertation Approval forms (submitted at least 10 days before the public defense). The meeting must be appropriately announced on campus, must be open to all interested parties, **and must take place before the posted semester Thesis or Dissertation defense deadline**. Plan I candidates must be registered during the semester in which degree requirements are completed. If degree candidates are covered by the student health insurance policy, or have student loans, it may be necessary to maintain at least half time registration status of 5 credit hours to retain these benefits. Check with the appropriate office if this is a concern.

When Plan II is followed, the final examination should take the form of a comprehensive survey of the candidate's activities in the graduate program. (A Plan II final examination is not required in some graduate programs.)

Recommendation for Degree

The candidate will be recommended for the master's degree to the Graduate School Dean by the graduate study committee or by the student's advisor and the graduate program director. This recommendation must be received no later than 20 days before the end of the semester in which the candidate is expected to complete all degree requirements http://www.uab.edu/graduate/deadline-dates. The recommendation will be based on evaluation of all work performed, the final examination, and the thesis if Plan I was followed. The recommendation will automatically be nullified if (1) the remaining courses needed for the degree are not passed, (2) the candidate fails to maintain good academic standing, (3) the candidate fails to remove all temporary grades from his/her transcript, or (4) the Plan I candidate fails to complete the thesis.

Award of Degree

Upon approval by the Graduate School Dean and payment of any outstanding financial obligations to the university, the President confers students' degrees by authority of the Board of Trustees.

Steps Toward Earning the Master's Degree

- Admission to master's degree program
- Selection of faculty advisor
- Maintenance of good standing
- Appointment of graduate study committee—Plan I (Thesis) only
- IRB and/or IACUC approvals obtained and renewed annually
- Admission to candidacy—at least one semester before graduation is expected—Plan I (Thesis) only
- Application for Degree—no later than 3 weeks after the beginning of the semester in which graduation is expected (see http://www.uab.edu/graduate/deadline-dates)
- Production of preliminary version of thesis (Plan I only)
- Defense of thesis (for Plan I only) (see http://www.uab.edu/graduate/deadline-dates)
- One PDF of the defended committee-approved thesis (Plan I only) submitted online no later than 2 weeks (10 business days) after the public defense
- Recommendation for degree
- Conferring of degree

Requirements for the Doctoral Degree

General Statement

The doctoral degree is granted in recognition of (1) scholarly proficiency and (2) distinctive achievement in a specific field of an academic discipline. The first component is demonstrated by successful completion of advanced coursework (of both a didactic and an unstructured nature) and by adequate performance on the comprehensive examination. Traditionally, the student demonstrates the second component by independently performing original research. In certain doctoral programs, performing a major project may be acceptable even though it may not consist of traditional research. However, in all programs, with the exception of DPT and DNP, a dissertation presenting the results of the student's independent study is required.

The Graduate School also recognizes professional doctorates awarded in preparation for the autonomous practice of a profession. Professional doctorates are accredited programs of study usually designed to prepare students for the delivery of clinical services or to assume specific types of administrative responsibilities. Students in professional doctorate programs must demonstrate competence in clinical practice and/or scholarship but are not required to conduct and defend original independent research. In lieu of a dissertation, students in programs designated as professional doctorate programs are required to demonstrate that they are capable of evaluating existing research, applying it to their professional practice, and expanding the body of knowledge on which their professional practice is based. This requirement is often met by the design and completion of a research or scholarly project submitted in writing and presented formally before the faculty in the program.

Faculty Advisor

Immediately after a degree-seeking student enters the UAB Graduate School, a member of the faculty of the graduate program to which the student has been admitted should be assigned to serve as the

student's advisor. This initial assignment may be a temporary arrangement. The student and the advisor should confer about the initial courses and any special work to be taken on the basis of the student's previous experience and the requirements of the graduate program.

Graduate Study Committee

As soon as possible, a graduate study committee should be formed to guide the student in a program of courses, seminars, and independent study designed to meet the student's needs and to satisfy program and Graduate School requirements. This committee should consist of at least five graduate faculty members, one or two of whom should be from outside the student's graduate specialization and each of whom should be able to contribute some relevant insight and expertise to guide the student. In all cases, at least three of the committee must be comprised of UAB Graduate Faculty members. Recommendations for graduate study committee composition are submitted by the advisor and the student to the program director, who subsequently submits these recommendations to the Graduate School Dean. Committee members must have credentials equal to or exceeding that of the degree that the student is pursuing and must have been approved by the Graduate School Dean for Graduate Faculty status. Graduate faculty appointments and instructions for requesting new appointments are available at http://www.uab.edu/graduate/faculty/gradfaclist. New Graduate Faculty appointments should be requested by the department and approved by the Graduate School Dean prior to any faculty member being recommended for placement on a student's committee. Graduate Faculty status definitions are available at http://www.uab.edu/graduate/faculty/definitions-of-graduate-faculty-categories. Changes to a student's committee must also be submitted on the appropriate form located at http://www.uab.edu/graduate/online-forms.

Transfer of Credit

Previously earned graduate credit that has not been applied toward another degree (either at UAB or elsewhere) is eligible for transfer into the student's current degree program. Ordinarily, no more than 12 semester hours of transfer credit can be applied to a degree program. Acceptance of more than 12 hours will require approval by the program director, department chair, and Graduate School Dean. All transfer requests must be initiated by the student and require the approval of the graduate program director and the Graduate School Dean. Transfer of Credit forms are available online at http://www.uab.edu/graduate/online-forms. Once transfer credit has been accepted, it will be included in the calculation of the GPA in the student's current UAB program.

Graduate credit earned with a grade of B or above by a graduate student in another accredited Graduate School may be considered for transfer. In programs offered jointly by UAB and other universities, all graduate credits earned in the program at a cooperating university are eligible for transfer to UAB. If a student earns credit in one UAB graduate program and is later admitted to another program, credits not applied toward meeting the degree from the previous program are eligible for consideration for transfer into the current program.

Minimum Course Credit Requirements

The Graduate School has minimum course credit requirements for students in doctoral programs. Program requirements for course work may exceed the Graduate School minimums. Graduate School minimum requirements are as follows:

1. If entering with a baccalaureate degree:
    a. Completion of 48 credit hours of course work prior to candidacy
    b. Up to 16 credits of the 48 can be as non-dissertation research credits
    c. Up to 10 credits can be as lab rotation, seminar, or directed study credits
    d. Doctoral students must satisfy one of the following:
        - Must complete at least two semesters in candidacy and accumulate at least 24 semester credit hours in 799 dissertation research. **OR**
        - Must complete at least two semesters as a student in candidacy and have accumulated at least 12 semester credit hours in 799 dissertation research, AND, either during or before candidacy, 12 semester credit hours in other appropriate research-based coursework, which has been approved by the graduate student's program. Courses which have been previously applied toward meeting the requirements of another degree are not eligible to satisfy the research credit requirement. The student's graduate department or program should provide a course planning curriculum worksheet detailing the courses taken which are intended to be used toward meeting degree requirements along with the student's application for degree.

2. If entering with a previous Masters degree appropriate to the doctoral degree field (Also applies to previously earned M.S., D.V.M., D.M.D., D.D.S., etc.):

a. Completion of 27 credit hours of course work prior to candidacy
b. Up to 6 credits of the 27 can be as non-dissertation research credits
c. Up to 6 credits can be as lab rotation, seminar, or directed study credits
d. Doctoral students must satisfy one of the following:
    - Must complete at least two semesters in candidacy and accumulate at least 24 semester credit hours in 799 dissertation research. **OR**
    - Must complete at least two semesters as a student in candidacy and have accumulated at least 12 semester credit hours in 799 dissertation research, AND, either during or before candidacy, 12 semester credit hours in other appropriate research-based coursework, which has been approved by the graduate student's program. Courses which have been previously applied toward meeting the requirements of another degree are not eligible to satisfy the research credit requirement. The student's graduate department/program should provide a course planning curriculum worksheet detailing the courses taken which are intended to be used toward meeting degree requirements along with the student's application for degree.

Up to 12 credits of course work that have not been applied toward meeting the requirements for an earned degree taken at UAB or other institutions may be used to satisfy these course credit requirements upon approval of the graduate program director and the Graduate School Dean.

Residence Requirement

The usual minimal period in which the doctoral degree can be earned is three academic years of full-time study, or longer if the student has periods of part-time enrollment. The nature of doctoral study requires close contact between the student and the faculty of the graduate program, and the individual investigation or other special work leading to the dissertation must be performed directly under the guidance and supervision of a full member of the UAB graduate faculty. Therefore, doctoral students should be in residence (enrolled) for three full semesters each year, including summers, during a three year period or collectively a minimum of nine semesters if the student has to take a leave of absence or stop out during the course of their doctoral education.

Foreign Language or Other Special Tools of Research

In consultation with the faculty, the director of each graduate program will specify any additional requirements, such as a reading knowledge of a foreign language or a working knowledge of statistics, that are considered essential to mastery of the academic discipline. Such requirements become conditions for the completion of the degree.

Comprehensive Examination

The scholarly proficiency of a doctoral student in the chosen field of study must be evaluated by comprehensive examination. The conduct of these examinations is the responsibility of the graduate program in which the student is enrolled and may consist of either individual examinations in several appropriate areas or a single combined examination. When both written and oral examinations are given, the written examination should precede the oral so that there is an opportunity for the student to clarify any misunderstanding of the written examination questions. Comprehensive exams should be administered no later than the end of the third year of the student's program.

Admission Into Degree Candidacy

When the student has passed the comprehensive examination, satisfied any program requirements for foreign language proficiency or mastered special research tools, and presented to the graduate study committee an acceptable proposal for dissertation research or special study, the committee will recommend to the Graduate School Dean that the student be admitted to degree candidacy. A student must be in good academic standing to be admitted to candidacy. Admission to candidacy must take place at least two semesters before the expected completion of the doctoral program. Students must be admitted to candidacy before they can register for dissertation research hours (i.e., 799).

Admission to candidacy is an important step forward in the student's pursuit of the doctoral degree. By approving admission to candidacy, the graduate student's committee indicates its confidence that the student is capable of completing the proposed research project and the doctoral program.

IRB and IACUC Approval

If the research involves human or animal subjects, approval from IRB or IACUC must be documented before admission to candidacy can be approved and must be kept current until the research is completed (please refer to Tip Sheet for Students Involved in Research Involving Human or Animal Subjects located on pages 51 and 52 of this *Handbook*. **The student's name must appear on the**

IRB approval form. The IACUC form must display the appropriate research protocol number.

Application for Degree

Each candidate for a doctoral degree must signify his/her intention to complete the degree requirements to meet a particular graduation date by submitting a completed Application for Degree Form. Because this form is used to check requirements, order the diploma, and include the student's information in the commencement program, it must be received in the Graduate School Office **no later than 3 weeks into the expected semester of graduation**. **However, because each graduate program may have an earlier deadline, the student should check with his or her program office for those deadlines as well.** The deadline dates can be accessed on the Graduate School website at http://www.uab.edu/graduate/deadline-dates. Students must be registered during the semester in which degree requirements are completed. If degree candidates are covered by the student health insurance policy, or have student loans, it may be necessary to maintain at least half time registration status of 5 credit hours to retain these benefits. Forms are available online at http://www.uab.edu/graduate/online-forms.

Dissertation

The results of the candidate's individual inquiry must be presented in a written dissertation comprising a genuine contribution to knowledge in the particular academic field. The document should also demonstrate the candidate's acquaintance with the literature of the field and the proper selection and execution of research methodology.

Signatures of committee members and program directors on approval forms indicate their assurance that they have examined the document and have found that it is of professional quality from all standpoints, including writing quality, technical correctness, and professional competency, and that the document conforms to acceptable standards of scholarly presentation. The Graduate School is responsible for ensuring that the final version of the dissertation meets the physical standards required of a permanent, published document and for adherence to the requirements stated in the UAB Format Manual (available online at http://www.uab.edu/graduate/images/acrobat/forms/theses/FormatManual.pdf.

Dissertation Defense

The dissertation defense should take the form of a presentation and defense of the dissertation work, which may include an examination of the candidate's comprehensive knowledge of the field. The time, date, and location of this examination is reported to the Graduate School via the online Request for Thesis or Dissertation Approval forms (submitted at least 10 days before the public defense). The meeting must be open to all interested parties, publicized on the UAB campus, and must take place before the posted semester thesis and dissertation deadline. Candidates must be registered during the semester in which the final examination is taken.

If in the opinion of one or two of the five members of the dissertation committee, the student has failed the dissertation defense, there is no consensus to pass. The chair of the committee shall advise the student that the dissertation fails to meet the requirements of the program. The chair shall notify the student in writing about the reason(s) for failure. If the student resubmits or submits a revised dissertation for consideration by his/her graduate program at least three members of the new examining committee shall be drawn from the original committee. If the revised dissertation fails to meet the requirements of the program, the student shall be dismissed from the graduate program.

In the event that only one of the five committee members dissent, that individual must submit a letter in which he/she outlines the reasons for their dissent to the student's advisor. The advisor and student may then prepare a rebuttal statement that is submitted, along with the letter of dissent, to the advisory or executive committee of the program for review. The advisory committee can then decide to accept or reject the rebuttal statement. If the rebuttal is accepted, the student is passed on his/her dissertation defense. If the rebuttal is rejected, the advisory committee can recommend to the student or advisor potential steps necessary to remediate the dissertation and potentially also the work therein, or the committee can recommend that the student be dismissed from the program.

Submission of the Dissertation

No later than 2 weeks (10 business days) following the public defense, the completed, final version of the committee-approved dissertation must be submitted (as a single PDF) for final review. Also submitted online are the UAB Publication Agreement, Survey of Earned Doctorates, and Graduate School Exit Survey. One copy of the signed approval form is submitted to the Graduate School office. Additional information concerning completing graduation requirements and the dissertation submission and publication process is available online at http://www.uab.edu/graduate/theses-and-dissertations-at-uab.

Graduate Student Exit Survey

Doctoral graduates are required to take the *Graduate School Exit Survey* as part of graduation requirements. Collecting important information and feedback from graduate students will help to improve the quality of graduate program offerings. After submission of the revised version of the student's final dissertation, he/she will be contacted via email

and provided the secure link to take the electronic survey.

Recommendation for Degree

The candidate will be recommended for the doctoral degree to the Graduate School Dean by the graduate study committee and the graduate program director. This recommendation, in the form of a signed approval form, must be received no later than 20 days before the end of the semester in which the candidate is expected to complete all degree requirements. Candidates must be in good academic standing to graduate, with no temporary grades for courses required for the degree on their transcripts, or any outstanding balance on their student account.

Award of Degree

Upon approval by the Graduate School Dean and payment of any outstanding financial obligations to the university, the President confers students' degrees by authority of the Board of Trustees. Doctoral students are generally expected to complete all degree requirements within 7 years of matriculation.

Steps Toward Earning the Doctoral Degree

- Admission to doctoral degree program
- Selection of faculty advisor
- Maintenance of good standing
- Appointment of graduate study committee
- Passing of comprehensive examination
- IRB and/or IACUC approvals obtained and renewed annually
- Admission to candidacy—no later than two semesters before expected graduation
- Application for degree—no later than 3 weeks into the expected semester of graduation (see http://www.uab.edu/graduate/deadline-dates)
- Draft of preliminary version of dissertation
- Review of the draft by committee members
- Revisions made to dissertation in response to committee feedback
- Defense of dissertation (see http://www.uab.edu/graduate/deadline-dates)
- A PDF of the defended committee-approved dissertation to UAB/ProQuest submission web site --no later than 2 weeks (10 business days) following the public defense
- Recommendation for degree
- Conferring of the doctoral degree

Academic Ethics and Conduct

As a graduate student at UAB, you have joined a distinguished academic community that is guided by a conviction in the worth of knowledge and its pursuit. By virtue of your membership in this community, you accrue many benefits—among them, access to the ideas and materials of others. Graduate students not only learn from others but also engage in the pursuit of new knowledge and, in some instances, teach or provide service to others. Being a member of an academic community and functioning in multiple roles in the community carries with it certain responsibilities. For this reason, we provide guidance here in the forms of both general standards of conduct and university policies.

As members of an academic community, students, faculty, and administrators share a responsibility to seek truths and communicate them to others. As we pursue knowledge and encourage learning, we acknowledge the need for a free exchange of ideas and recognize the importance of listening to and maintaining respect for the views of others. We must always aspire to learn, apply, and communicate to others the best scholarly standards of the disciplines in which we are involved. High scholarly standards demand high ethical standards. We must commit to learning and communicating the best ethical standards and their application to our disciplines. In interactions with others, we must demonstrate respect for them as individuals, give credit for significant academic or scholarly assistance, and respect the confidential nature of some exchanges. We must adhere to the highest standards of academic conduct, avoiding those acts of misconduct and dishonesty that undermine the purposes of the academic community.

All UAB students are expected to be familiar with the UAB Academic Honor Code as well as any honor codes that are specific to their schools or disciplines. The code represents a commitment to integrity in the academic community and a respect for an individual's educational endeavors:

> *I have read and, by choosing to become a member of the UAB academic community, accept the UAB Honor Code. I understand that violation of this code will result in penalties as severe as expulsion from the university. I promise and confirm that I will not, at any time and under any circumstances, involve myself with abetting, cheating, plagiarism, fabrication, or misrepresentation while enrolled as a student at the University of Alabama at Birmingham.*

Academic Integrity — Honor Code

The University of Alabama at Birmingham expects all members of its academic community to function according to the highest ethical and professional standards. Students, faculty, and administration of the institution must be involved to ensure this quality of academic conduct.

Academic misconduct undermines the purpose of education. Such behavior is a serious violation of the trust that must exist among faculty and students for a university to nurture intellectual growth and development. Academic misconduct can generally be

defined as all acts of dishonesty in an academic or related matter. Academic dishonesty includes, but is not limited to, the following categories of behavior:

ABETTING: helping another student commit an act of academic dishonesty. Allowing others to copy your quiz answers, or use your work as their own are examples of abetting.

CHEATING: use or attempted use of unauthorized materials, information, study aids, the answers of others, or computer-related information.

PLAGIARISM: claiming as your own the ideas, words, data, computer programs, creative compositions, artwork, etc., done by someone else. Examples include improper citation of referenced works, use of commercially available scholarly papers, failure to cite sources, and copying others' ideas.

FABRICATION: presenting as genuine falsified data, citations, or quotations.

MISREPRESENTATION: falsification, alteration or misstatement of the contents of documents, academic work, or other materials related to academic matters, including representing work substantially done for one class as work done for another without receiving prior approval from the instructor. Misrepresentation also includes misrepresenting schedules, prerequisites, transcripts, or other academic records.

A student who commits an act of academic misconduct within the context of meeting course requirements will be given the grade of F in the course or on the assignment at the discretion of the department or program in which the misconduct occurred. Academic misconduct can occur in other contexts as well, such as when taking comprehensive examinations, performing research, preparing manuscripts or generally during the performance of other activities related to the process of satisfying degree requirements. Under Graduate School policy the program in which the student is enrolled may choose to expel the student from the university **on the first offense**. If, as determined by the records of the Graduate School or the department or program, the act of academic misconduct is a second offense, the student will be expelled from the university. The transcript of a student expelled for committing academic misconduct will bear the statement "Expelled for Academic Misconduct." Withdrawal from a course while a possible violation of the Academic Honor Code is under review will not preclude the assignment of a course grade that appropriately reflects the student's performance prior to withdrawal if the violation is substantiated.

Procedure for Reporting a Suspected Violation

When a faculty member or another student sees cause to charge a student with academic misconduct, within 7 days of noting the incident that individual will communicate the charge to the department chair or program director of the department or program in which the accused student is enrolled. The department chair or program director to whom the charge is presented will notify the student of the charge and provide the student with an opportunity to respond. If the student can respond in a way that, in the opinion of the program director and the department chair, either dispels the charge or provides the opportunity to resolve the issue informally, an informal resolution can be prescribed. If the student cannot refute the charge effectively, the department chair or program director will expeditiously notify the student of the administrative action to be taken. The notice shall also inform the student of the right to appeal and the steps involved in that process. Copies of any such communication will be provided to the academic dean of the school in which the student is enrolled.

If the school or department in which the student is enrolled has its own honor code, then the procedures of that honor code must be followed, including any prescribed appeals process. For dual degree students whose academic misconduct occurs in one of their two schools, the honor code of the school in which the infraction occurred should prevail.

However, if no local honor code exists, the following procedure must be followed.

Right to Appeal and Formation of an Honor Council

If a student is the subject of an administrative action as the result of an academic misconduct violation and wishes to contest that administrative action, he / she may appeal in writing to the dean of the school in which the student is enrolled. The dean will then convene an Honor Council consisting of five students and three faculty members from various departments within the school. All of the students chosen to serve must be in good academic standing.

The Honor Council shall elect a chairperson from among the eight members. The Chair may be either a student or faculty member. The duties of the Chair include convening the Honor Council, presiding over hearings and communicating with the administration of their school on behalf of the Honor Council. In all matters, the members of the Honor Council are instructed to treat the information put forward to them with the strictest confidence. Breaches of confidentiality are themselves violations of the Student Honor Code and will be treated as such.

Initial Procedures

After being informed of the charges and the

failure to reach an informal resolution, the Academic Dean may also attempt to informally resolve the impasse between the student and the faculty member(s). In the event this attempt is unsuccessful, the Academic Dean shall refer the allegation(s) to the Honor Council. The Academic Dean will provide the Honor Council with a statement of the allegation(s) against the accused student, a description of the evidence and supporting documents (if available). The Honor Council shall convene to review the charge and all evidence supporting it. After review, the Council may either dismiss the allegation(s) on the grounds that insufficient substantiating evidence exists, or support the charges, also based on the evidence. The Honor Council shall provide notice of the specific charge or of the dismissal of the alleged violation to the accused student by certified mail, return receipt requested, or by hand delivery, and to the Academic Dean. If substantiated, the statement of the charge shall include a brief summary of the alleged violation and the evidence presented in support of the charge, in enough detail as to allow the accused the opportunity to rebut the charge, and shall provide notification to the accused student of his/her right to a hearing. The accused student must respond to the charge within five days, unless excused by the Honor Council. In his/her written response to the Honor Council, the accused student must admit or deny the charge and must formally request or waive his/her right to a hearing before the Honor Council.

Once notice of the specific charge has been provided to the accused student and to the Academic Dean, the Honor Council shall decide on a time for the hearing and any preliminary deadline(s) for the submission of supporting documents and the names of proposed witnesses. Granting a request from the accused, or from the School, to reschedule the hearing is within the discretion of the Honor Council, but shall not be unreasonably denied. The Honor Council shall provide written notice to the accused student of the time and place for the hearing, and if witnesses are to be called in his/her defense, ask the student to provide their names along with a statement describing the testimony of each witness. The Honor Council shall review any documentary evidence provided by the student in advance of the hearing.

The Hearing

The process shall generally include the following: (1) call to order by the Chair; (2) introduction of those present; (3) statement of the Charge and possible penalties if the charge is proven; (4) statement of the evidence and testimony in support of the charge, and questioning of witnesses; (5) statement of evidence and testimony in opposition to the charge (rebuttal), and questioning of witnesses; (6) closing statement. All questioning of witnesses shall be by the Honor Council unless the Honor Council shall decide otherwise.

A hearing before the Honor Council shall not be bound by formal rules of evidence or judicial rules of procedure. The Honor Council may hear any testimony or receive any supporting evidence that it deems to be pertinent to the charge. Both the accused and a representative of the School may be present throughout the hearing. The accused student shall be afforded a reasonable opportunity to be heard, to question witnesses indirectly through the Honor Council, to rebut adverse evidence, and to make a brief closing statement. Members of the Honor Council may ask any questions at any time during the hearing and may elect to disallow or to curtail testimony that the Honor Council determines to be unnecessarily redundant or not relevant to the issue(s) being heard. Throughout the hearing, all persons present shall conduct themselves in an orderly manner.

The accused may be accompanied at the hearing by an advisor of his/her choosing, however, the advisor may not participate in the hearing. The Honor Council shall be responsible for the conduct of the hearing at all times and shall keep a record of the proceedings in a format it chooses. Hearings before the Honor Council are confidential proceedings and only those persons determined by the Honor Council to have a need to be present shall be included. Except for the accused (and an advisor if invited by the accused) and the representative of the School, all other witnesses shall be excluded from the hearing room, except when testifying. No more than one witness shall be called to testify at a time. The School or the Honor Council may elect to invite UAB Security to be present at an Honor Council hearing.

As soon as practicable following the conclusion of the hearing, the Honor Council shall meet in private session to consider all of the evidence presented, and shall decide on one of two outcomes. The decision of the Honor Council shall be that the charge is either (1) proven by a preponderance of the evidence or (2) not proven by a preponderance of the evidence. A vote of six of the eight members shall be required for the charge against the accused to be proven. Following the vote, the Honor Council shall record the vote and shall provide a brief narrative statement explaining the rationale for their finding(s). The written decision and rationale of the Honor Council shall be transmitted to the Academic Dean, by internal communication, upon the conclusion of the Honor Council's deliberations. The Honor Council shall notify the accused of the outcome by certified mail, return receipt requested, or by hand delivery. A decision of the Honor Council in favor of the accused student shall conclude the case.

Penalties for Violation of the Honor Code

Generally, a first violation of the Honor Code shall result in the assignment of a failing grade in the assignment or in the course in which the violation occurred, at the discretion of the instructor. A notation on the student’s permanent academic record

may also be made to indicate that a reduced or failing grade was assigned because of an Academic Misconduct violation (e.g., "F, Academic Misconduct violation, June 15, 2006"), on the judgment of the Honor Council. A second violation of the Honor Code shall result in expulsion from the University. No student may graduate until pending allegations of an Academic misconduct violation have been resolved. No student expelled from the Graduate School because of an academic misconduct violation shall be eligible for readmission.

If at the end of the appeals process performed at the school level, the accused student wishes to appeal to the Graduate School Appeals Board, he/she must follow the procedure outlined in this Handbook. Upon receipt of the appeal from the student, the Graduate Dean will request from the Academic Dean of the school in which the student is enrolled all appropriate documentation accumulated to that point. The Graduate Dean will then be responsible for maintaining records of all additional proceedings.

Nonacademic Conduct

The university is a community of scholars and learners; therefore, all participants are expected to maintain conduct that (1) facilitates the institution's pursuit of its educational objectives, (2) exhibits a regard for the rights of other members of the academic community, and (3) contributes to the maintenance of a healthy learning environment. Through appropriate due process procedures, conduct action will be taken in response to behavior that violates these principles. The office of Non-Academic Student Conduct supports the mission of the university by protecting the rights of all members of the university community and by promoting civility, integrity, responsibility, openness, mutual respect and justice by enforcing community standards. A more detailed description of nonacademic misconduct can be found in the student handbook, Direction. It is the student's responsibility to be fully aware of the policies and procedures described in Direction. The Office of Student Life and the Vice Provost for Student and Faculty Success have the responsibility for coordinating policies and procedures regarding students' nonacademic misconduct.

Graduate School Appeals Board (GSAB)

A. Purpose:

The purpose of the GSAB is to review appeals brought by graduate students of decisions made by university representatives concerning

1. retention in graduate programs,
2. charges of academic misconduct or dishonesty,
3. selected other issues related to graduate education as deemed appropriate to forward to the GSAB by the Graduate Dean, the provost, or other university officials.

B. Limitations:

The GSAB **will not** review

1. appeals of course grades,
2. appeals for which the student has not previously fully used all other applicable appeal or review processes,
3. appeals filed more than 30 calendar days from the date of a prior review or 30 calendar days from the date of receiving notification of an action or decision,
4. misconduct in research which falls under the Policy Concerning the Maintenance of High Ethical Standards in Research and Scholarly Activities.
5. grievances brought against the faculty of a specific program. Program faculty report to the chairpersons and deans in the schools in which they hold their primary appointments. Accordingly, it is the responsibility of those chairpersons and deans to adjudicate at the school level any appeals brought by graduate students against their faculty. Decisions made at the school level in such cases will not be reviewed by the Graduate School Appeals Board.

C. Composition:

The GSAB will consist of five members of the graduate faculty and three graduate students in good standing, all broadly representative of the graduate programs in the university. The GSAB will be chaired by a designee of the Graduate Dean. Members of the committee will be appointed on an ad hoc basis as needed by the Graduate Dean. The Graduate School will provide support personnel for the board to record proceedings of hearings.

D. Meetings:

The GSAB will meet as soon as possible after assembly by the Graduate Dean to adjudicate a pending appeal. A quorum for a meeting will be at least five persons: three graduate faculty members and at least two graduate student members. Any member of the GSAB may disqualify himself or herself. After notification of the Board composition, the student bringing the appeal may disqualify one faculty and one student member of the board. If the disqualification of board members results in absence of a quorum, the process will be suspended until the Graduate Dean can appoint additional members.

E. Notification:

The chair of the GSAB will notify the student bringing the appeal and the student's program director of the decision reached by the GSAB in the initial review of the appeal—specifically, whether an appeal will be heard. If a hearing is to be held, the chair will notify the student and student's program director of the date, time, and place for the hearing. The chair of the GSAB is responsible for notifying the Dean of the Graduate School of the findings and

recommendations reached by the GSAB after the hearing. The Dean of the Graduate School will notify the student and student's program director of his or her action.

F. Authority:

The GSAB may recommend affirming or reversing the decision being appealed and making such recommendations for further actions as seem appropriate. In the course of any hearing, the GSAB is authorized to request additional evidence from, or the appearance of, any student, faculty or staff member, or other employee of the university, or other individual as a witness. The GSAB shall have final authority in procedural matters. The GSAB will forward recommendations to the Dean of the Graduate School along with a record of the hearing proceedings. The Dean will make a final independent decision, taking into account the findings and recommendations of the GSAB and the records of the hearing. The Dean will inform the relevant parties and the GSAB of the decision in writing within 14 calendar days of receiving the GSAB recommendation.

Procedures

A. Filing an appeal:

Before a request for an appeal is accepted by the GSAB, the normal channels for resolving disputes must have been followed. First, the student should consult with his or her advisor to resolve the issue at that level. If the issue is not then resolved, the student should seek out the program director or department chair to request a resolution. If the program director and department chair have not been able to resolve the appeal or the action still needs to be pursued, it is then appropriate to pursue the issue with the academic college or school dean. At that point either the Honor Code of the school in which the student is enrolled should be invoked, or if no school based Honor Code exists, the Honor Council procedure described previously should be followed. If the concern has not been resolved to the satisfaction of the student at any one of these levels, an appeal to the GSAB may then be pursued.

All requests for appeals to be considered by the GSAB must be submitted to the Dean of the Graduate School, in writing, on the approved form (available in the Graduate School office and online) along with supporting documents and any other pertinent evidence. The written appeal must specify the grounds for the appeal. It is the responsibility of the student making the appeal to demonstrate to the GSAB that grounds for the appeal exist.

The Dean of the Graduate School will notify those individuals whose decisions are being appealed and will request relevant information. Information and evidence will be transmitted to both parties and to all members of the GSAB. Any additional evidence brought to the hearing is subject to acceptance or rejection by the GSAB. All information submitted becomes part of the permanent record of the GSAB hearing record maintained by the Graduate School.

B. Initial review of appeals:

The GSAB will be convened by the chair to conduct an initial review of the appeal to determine whether the appeal is subject to dismissal or if further action by the GSAB is warranted. Appeals that fail to set forth grounds for a full review by the GSAB shall be dismissed.

The GSAB will consider appeals when

1. all other levels of appeal have been exhausted.
2. the student can show grounds that he or she was previously denied a fair hearing.
3. the decision being appealed is not supported by substantial evidence.
4. the sanction being imposed is beyond the authority of the personnel involved.
5. the sanction or action is unduly severe or disproportionately harsh in comparison to like cases.

When the GSAB determines that a graduate student should be afforded a hearing on an appeal, the chair of the GSAB shall give written notice to all parties involved in the appeal, allowing no less than one week of preparation time before the hearing.

C. Hearings:

All hearings by the GSAB shall be subject to the following requirements:

1. Any additional materials requested by the GSAB at the time of the initial review to be considered at the hearing shall be made available to all parties prior to the hearing.
2. Parties to the appeal have the right to be present and hear all arguments and oral statements made to the GSAB committee.
3. Parties to the appeal shall make arguments, present oral statements and written documents, and question witnesses with regard to any issues of fact relevant to the grounds for appeal.
4. Hearings shall not be adversarial in nature and shall be conducted in a manner conducive to ascertaining the facts of the case upon appeal.
5. The GSAB may establish time limitations for presentations before the board.
6. Hearings shall be closed to the public.
7. GSAB members may address questions to any person giving testimony before the board.
8. In hearings involving more than one student, a single hearing may be scheduled for each.
9. It shall be the responsibility of the GSAB chair, together with the recording secretary, to see that the integrity of the record is maintained.
10. The chair shall preside and rule on matters of procedure and evidence.
11. The chair shall have the right to dismiss anyone from the hearing should his or her conduct

become disorderly.

D. Findings, decisions and recommendations of the GSAB:

Upon completion of hearings, the GSAB shall meet in closed session for deliberations. A simple majority vote of the GSAB is required to substantiate all findings and recommendations. In determining its findings and recommendations, the board shall concern itself only with whether reasonable people, acting on the available evidence, could have made the same decision or taken the same action as the one being appealed.

The GSAB shall prepare written findings addressing all issues presented in the appeal and shall make a recommendation that indicates whether the appealed decision or sanction should be affirmed, set aside, or modified. The GSAB may also make recommendations, if appropriate, for further actions by university authorities.

The Dean of the Graduate School has 14 calendar days to act upon the findings and recommendations of the GSAB. If no action is taken within the 14 days, except when extenuating circumstances justifying a delay are involved, the findings and recommendations of the GSAB will be final. Further appeal is not available within the university.

The application for a hearing before the GSAB is available in the Graduate School office, Hill University Center Room 511, and at the Graduate School's Web site (http://www.uab.edu/graduate/images/acrobat/forms/acadappeal.pdf).

Requirements for UAB Employees

Policy 1: UAB Employees who enroll in a Ph.D. program

UAB employees who enroll in a Ph.D. program and continue to work full time:

A. Cannot also be a full time student*
B. Cannot enroll for more than 18 credit hours per academic year (fall, spring and summer)*
C. Are not eligible to be supported on a training grant as they are not full time students
D. Cannot be simultaneously supported by a UAB Graduate Assistantship
E. Thesis or dissertation work may not be initiated until the student enrolls in a program (i.e. data generated by the employee/student prior to enrollment that has been submitted for publication or published cannot be included in a thesis or dissertation)
F. Must meet the same set of program requirements as all other students
G. The dissertation committee is responsible for assuring that these stipulations are met
H. The mentor/employer must acknowledge in writing his/her agreement for the employee to be a part time student while continuing to be a full time UAB employee. Written acknowledgments must be submitted to the program director and the Graduate School.*
I. The Program Director and dissertation committee must agree in writing to a protracted course of study*

*Stipulations A, B, H and I do not apply to employees of companies which support their employees as full time students in a UAB Ph.D. program.

Policy 2: Compliance with institutional and Graduate School policies for student compensation

UAB employees who wish to become full time graduate students and continue to work part time cannot work more than 10 hours per week outside their commitment to meet the requirements of their predoctoral program.

Financial Information

UAB Payment Policies

Beginning fall 2011, standard tuition payment deadlines for all UAB graduate students changed. For detailed information regarding tuition payments and deadlines, check the Student Billing and Payment Policy Web site at http://www.uab.edu/whentopay/policy. Student account payment deadlines are available on the Academic Calendar, https://www.uab.edu/students/academics/academic-calendar, for each term.

Internal Payment Options

There are multiple ways to pay tuition and fees. Payment by mail should be directed to UAB Student Accounting Services; HUC 322, 1720 2nd Ave. S., Birmingham, AL. 35294-1150. Questions for Student Accounting may be directed to (205) 934-3570. Payments may be made in person in the Hill University Center, 1400 University Boulevard, in Room 322; Making payments via the Web is available through BlazerNET.

Monthly Payment Option

Tuition Management Systems (TMS) is UAB's education payment partner. This Interest-Free Monthly Payment Option is an alternative to large annual or term payments and helps limit borrowing. The monthly payment option allows students and parents to begin making tuition payments before the semester begins ~ May, June, or July for Fall term and October, November, or December for Spring term. Students contract with TMS, and then TMS submits the student's payments to UAB. Funds are then applied to the student's account prior to the

payment deadline. Students may split their semester costs into either 3, 4 or 5 payments per semester (8 or 10 payments per academic year) depending on when they enter into the contract with TMS. For more information, please go to http://www.afford.com/uab

Amount Owed

An account balance summary is provided for each student under the Student Resources tab on BlazerNET. Charges shown on that statement are based on the student's status and courses as of the date of registration. School, classification, or course changes made after registration may result in additional charges. Credit for financial aid, external payment plans, UAB Educational Assistance benefits, or payments to be billed to a third-party vendor may not be reflected on the account summary. Fifty percent of the student's account balance is due before classes begin. Failure to meet payment deadlines will result in the student's being dropped from his/her courses for non-payment (see Academic Calendar located at https://www.uab.edu/students/academics/academic-calendar).

For information or clarification concerning the amount due, please call Student Accounting Services at 205-934-3570.

Delinquency Policy

If any student has an unpaid financial obligation to UAB, all grades will be withheld and no transcripts will be issued for that student. Such a student will not be permitted to register at UAB again and all services will be withheld until the obligation is paid in full, at which time withheld grades will be reinstated. A debt to UAB is, of course, legally enforceable. To be fair to the overwhelming majority of students who honor their commitment, UAB's policy is to pursue unpaid student debts vigorously by all legal means.

Withdrawals and Refunds

If you withdraw from a course (using the appropriate procedures) prior to the close of business on the published date for Last Day to Drop Without Paying Tuition and Fees, you will owe no tuition for that course. However, if you are still registered for a course at the close of business on the Last Day to Drop/Add Without Paying Full Tuition and Fees, you must pay full tuition and fees for that course, even if you withdraw later. No refunds can be made unless a licensed physician certifies that a condition, which arose after the last day to withdraw during the Drop/Add period, was of sufficient duration and severity to make it impossible for you to continue in the course.

Students who wish to withdraw from courses for which they are registered must use the official procedures specified on BlazerNET. **Mere failure to attend class does not constitute a drop or withdrawal**. If the withdrawal request is received after the Last Day to Withdraw Without Paying Full Tuition and Fees during the Drop/Add period, full tuition and fees will be due for the courses from which the student withdraws. Withdrawal deadlines can be found on the Academic Calendar, https://www.uab.edu/students/academics/academic-calendar.

Academic Common Market

The Academic Common Market is an interstate agreement among selected states for sharing academic programs at both the baccalaureate and graduate levels. Participating states are able to make arrangements for their residents who qualify for admission to enroll in specific programs in other states on an in-state tuition basis.

Participating states are Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

If you are not an Alabama resident and you wish to enroll at UAB as an Academic Common Market student, you must be accepted for admission into a UAB program to which **your state has obtained access for its residents** through the Academic Common Market coordinator in your home state.

Certification of eligibility must be received by the Graduate School before the first day of class in the initial semester of registration to obtain in-state tuition status for the entire program; otherwise, in-state tuition status will be awarded beginning with the semester following receipt of this certification.

To obtain the name and address of a state coordinator, visit the Academic Common Market Web site (http://www.sreb.org/programs/acm/acmindex.aspx).

Financial Aid

Assistantships and Fellowships

In many programs, graduate student awards are available in limited number in the form of assistantships (service required) or fellowships (no service required). The Graduate School also assists students in preparation of applications for extramural fellowships.

The university's Financial Aid Office administers traditional loan, grant, and work-study programs, and students in certain graduate programs may participate in UAB's Cooperative Education Program, combining their studies with paid work experiences. Only degree-seeking students who are registered at least part-time are eligible for financial aid. For information concerning these programs, contact the Office of Student Financial Aid, Room 317, Hill University Center, 1400 University Blvd, Birmingham, Alabama 35294-1150, 205-934-8223, http://main.uab.edu/Sites/students/32619/.

Veterans

Enrolled veterans and dependents who are eligible for federal educational benefits through the Department of Veterans Affairs should apply online at the VA website, www.GIBILL.va.gov. UAB-VA is responsible for verifying your enrollment and semester hours and forwarding the information to the Regional VA office.

For more information about federal educational benefits, contact UAB-VA in the Office of Student Retention Programs, Room 531, Hill University Center, 1400 University Boulevard, Birmingham, AL 35294-1150, telephone 205-934-8804, email nicolesellers@uab.edu

Facilities and Services

Lister Hill Library of the Health Sciences

The Lister Hill Library of the Health Sciences, established in 1945, is the largest biomedical library in Alabama and one of the leading such libraries in the South. It serves as a resource library in the National Network of Libraries of Medicine for the Southeast/Atlantic Region. Access to electronic resources is available across campus and remotely to authorized users. The library provides a variety of reference and educational services plus extensive educational opportunities through one-on-one instruction at point of need or in scheduled workshops on using library resources or searching for information. To contact the library for assistance, see http://www.uab.edu/lister/ask/.

Reynolds Historical Library

The Reynolds Historical Library, located on the 3rd floor of the Lister Hill Library of the Health Sciences, was a gift of Dr. Lawrence Reynolds, a distinguished radiologist and editor. The growing collection includes over 13,000 rare books and manuscripts pertaining to the history of medicine and science, dating from the 14th to the early 20th centuries.

Mervyn H. Sterne Library

The Mervyn H. Sterne Library houses a collection of over one million items selected to support current teaching and research at UAB. In addition to books and more than 2,500 periodicals, the collection consists of microforms and other print and nonprint materials. Access to the collection and other information resources is provided through an online public access catalog system. Users may access the system from the library or remotely. Study areas and photocopying machines are located throughout the library, which is located at 917 13th Street South. The facility has seating space for about 1,100 students. More than 100 lockable study carrels are available for use by faculty and graduate students involved in writing projects.

Reference services are provided by subject specialist librarians and at information desks staffed to assist patrons in identifying and locating materials. Reference service also includes computerized database searching.

Student Health and Insurance Programs

Student Health Service

All UAB students are eligible to be seen at Student Health Services. Mandatory students are automatically charged the appropriate Student Health Fee. This allows unlimited visits with a provider with no co-pays and/or medical clearance services through a web-based program.

Optional students, those not mandated to participate, may also pay the $100 per semester fee, allowing for unlimited provider visits with no co-pay. Optional students also have the option of paying a $30 per-visit fee, which covers a one-time visit with a SHS provider. However, if a student visits the SHS three times in a semester, paying $30 each time, they are converted to the semester plan at that point, with unlimited provider visits without additional charge for the remainder of that semester. For all of the above options, services not included in the fee, as defined in the Plan Fee Coverage section, will be billed to the student or the student's insurance. Students are not required to have insurance to participate with SHS.

More information regarding the Student Health Service can be found at http://main.uab.edu/Sites/students/student-health-services/48149/.

Hospital and Major Medical Insurance Programs

Hospitalization and major medical insurance coverage is available at attractive rates to students enrolled in the Student Health Service. Spouses and children of eligible graduate students may also obtain coverage under this policy at a proportionate increase in premium. Students who are already covered by hospitalization insurance that offers coverage equivalent to that in the UAB student hospitalization policy may sign a waiver to this effect and not be required to take the UAB policy. Failure to sign and file a waiver with the Student Health Service will result in automatic coverage with Student Health Service insurance, and the student will be billed.

Health Forms and Insurance Information

For all students who will be participating in the Student Health Service, the application for student insurance is located at http://www.vivaemployer.com/Download.aspx?ID=81&Type=doc. Depending on the academic program in which you are enrolled, you may be required to have major medical insurance. Generally all international students and all students in clinical programs--those programs which require that you work with human or primate tissues or patients--are required to have health insurance. Details about this

mandatory health insurance, as well as the waiver process for students who already have acceptable insurance, are available here: http://www.uab.edu/studenthealth/insurance-and-waivers.

For additional information on UAB's Student Health Service and group hospital insurance plan, students should contact UAB Student Health Service, Suite 221, Community Health Building, 930 20th Street South, Birmingham, Alabama 35294-2041 (telephone 205-934-3581, www.uab.edu/studenthealth).

Enrollment Services

The following services are provided to assist students during their academic careers: TRIO Academic Services, Career and Professional Development Services, Disability Support Services, Veteran Recruitment and Student Services, Counseling and Wellness Services, and Women's Counseling Center. Some of these services are described online at http://main.uab.edu/Sites/students/services/, and http://main.uab.edu/Sites/students/life/,

If you are a first-generation college student, have a disability, or meet federal income requirements, you might be eligible for free support services and incentives created to help you achieve your goal of graduating. UAB's **TRIO Academic Services** (TAS) is a Student Support Services program that is a part of a network of TRIO programs fully funded by the U.S. Department of Education. The mission of TAS is to provide academic and personal support to help participants be successful in pursuing their educational goals at UAB. Contact 205-934-2729 or TrioAcademicServ@uab.edu for detailed information.

UAB Career and Professional Development Services engages students in the career development process of exploring career options, gaining experience in a chosen field, preparing for the job search, and succeeding in their career goals. More information is located at www.careerservices.uab.edu

UAB is committed to making its academic programs and services accessible to students with disabilities. Qualified students with disabilities are protected from discrimination based on their disability, as guaranteed by the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973. Contact the **UAB Disability Support Services** office at dss@uab.edu, (205) 934-4205 (Voice), or (205) 934-4248 (TDD) for details.

UAB Veterans Services works closely with the U.S. Department of Veterans Affairs to offer various entitlement programs to students who have served in the military on active duty, are members of the selected Reserves/National Guard, or are dependents or spouses of veterans. Contact veteransaffairs@uab.edu or 205-934-8804 for more information.

The **Counseling & Wellness Center** offers no cost, confidential counseling related to personal growth, human development and interpersonal relationships. Services are available to all currently-enrolled UAB students. Programs and events held throughout the year are designed to provide opportunities to enhance wellness and demonstrate that healthy living can be both practical and enjoyable. For more information about the Counseling and Wellness Center, call 205-934-5816.

The **Women's Counseling Center** at UAB provides confidential personal counseling services (non-academic) to UAB students. Our licensed professional counselor can assist you in dealing with issues such as eating disorders, relationship problems, rape, sexual abuse, sexual harassment, or managing your stress. The center can also provide you with information and resources regarding other services in the UAB community and Birmingham area. For more information about the Women's Center, call 205-934-6946.

Distressed Students

College life, work and other outside influences can be stressful and overwhelming, which can impact a student in a variety of ways. If you are experiencing difficulties as a result of these sorts of stressful influences, please take advantage of one or more of the resources indicated by the links below:

- UAB Counseling & Wellness Center (934-5816)
- Women's Counseling Center (934-6946)
- Campus Counseling Center (934-3779)
- Crisis Center (323-7777)
- Rape Response (323-7273)
- Disability Support Services (934-4205)
- Safe Zone (934-4175)
- Student Health Services (934-3580)
- UAB Hospital ER (934-4322)

UAB Policies

In addition to the UAB policies contained in this handbook, other university-wide policies apply to students. These include additional policies concerning health care for international students and visiting international scholars, AIDS and AIDS-related conditions, a drug-free workplace, alcoholic beverage use, smoking, electronic data processing security, and computer software use. Copies of these policies are available in the Graduate School office, in the online Graduate Catalog, and on the UAB Policies and Procedures Library Web site (http://sppublic.ad.uab.edu/policies/Pages/default.aspx)

Graduate School Policy Concerning Student Participation in Proprietary Research

August 28, 2007

Faculty, staff, and students of a university create, disseminate, and apply knowledge for the benefit of society. When faculty of the university are involved in research, some of which may be of a proprietary nature, particular care must be taken to ensure that the need for graduate students to publicly present and publicly defend the results of their thesis or dissertation research is not compromised. Graduate student advisors, graduate program directors, and graduate students themselves, therefore, share in the responsibility to ensure that graduate students are well informed if they become involved in thesis or dissertation research that is, or has the potential to become, proprietary if participation in that research will delay completion of their degree requirements or negatively affect their productivity or future employability. Students must be made aware of the implications of performing thesis or dissertation work of a proprietary nature. For example, will that work delay time to degree, or will it have a potential negative effect on obtaining a postdoctoral position or an employment opportunity? In cases where the thesis or dissertation work has intellectual property implications, adherence to university policies on intellectual property is required.

It is the policy of the Graduate School that a faculty member or a graduate student should not enter into an agreement that prevents or significantly delays the presentation or publication of research results unless the delay is required for proprietary reasons. Students and their advisors can embargo the release of the contents of a thesis or dissertation by both the UAB library and ProQuest UMI for up to two years to provide time to resolve intellectual property considerations or prior publication issues. If, however, a decision is made to embargo a student's thesis or dissertation, or delay publication of work described therein, these decisions should not delay the student's time to completion of his/her degree requirements.

In instances where, despite good faith efforts on the part of the graduate student advisor, the graduate program director, and the graduate student, a dispute arises regarding the release or publication of a graduate student's thesis or dissertation research, the Graduate School Dean must be notified. The Graduate School Dean will immediately convene a meeting of the graduate student, the graduate advisor, the involved graduate program director, and members of the student's thesis or dissertation committee. This group, in consultation with the Vice President for Research and/or the Executive Director of the Research Foundation, will resolve the problem.

If the situation cannot be resolved through the efforts of this group, a ruling will be made by the Senior Vice President and Dean, School of Medicine; the Vice President for Research and Economic Development; or the Provost.

UAB Policy Concerning the Maintenance of High Ethical Standards in Research and Other Scholarly Activities

January 27, 1997

[Editorial changes made June 28, 2007]

This policy has been adapted from a statement on "The Maintenance of High Ethical Standards in the Conduct of Research" published by the Executive Council of the Association of American Medical Colleges and has been revised to be in compliance with the Public Health Service final rule entitled "Responsibilities of Awardee and Applicant Institutions for Dealing With and Reporting Possible Misconduct in Science." It incorporates recommendations of the UAB Faculty Policies and Procedures Committee and the UAB Faculty Senate.

Introduction

The principles that govern scientific research and scholarship have long been established and have been applied by faculties and administrators for the discovery of new knowledge needed by mankind. The maintenance of high ethical standards in research based on these principles is a central and critical responsibility of faculties and administrators of academic institutions. Validity and accuracy in the collecting and reporting of data are intrinsically essential to the scientific process; dishonesty in these endeavors runs counter to the very nature of research, that is, the pursuit of truth.

The responsibility of the academic community to the public is acknowledged. The maintenance of public trust in this pursuit is vital. In short, it is in the

best interest of the public and of academic institutions to prevent misconduct in research and to deal effectively and responsibly with instances in which misconduct is suspected.

Policy Statement

1. UAB shall accept as faculty members only those individuals whose career activities clearly demonstrate the highest ethical standards. To this end, the credentials of all potential faculty are to be thoroughly examined by the appropriate department/unit heads or their representatives in order to verify the claimed accomplishments of the candidate. The appropriate department/unit heads or their representatives shall seek further confirmation of the candidate's accomplishments during the normal procedures of personal interviews and letters from references. Proof of faculty credentials shall be maintained by the appropriate dean or department head.

2. Faculty members who are in supervisory positions with regard to colleagues, fellows, technicians, and students are expected to work closely with those individuals to provide them with appropriate guidance and counsel to the end that those individuals continue to maintain the highest professional and ethical standards.

3. The faculty is encouraged to increase student and staff awareness of the importance of maintaining high ethical standards in research and to discuss issues related to research ethics in formal courses, in seminars, and by other informal means.

4. Research results should be supported by verifiable evidence. Faculty and staff should maintain sufficient written records or other documentation of their studies. It is the responsibility of department/unit heads, division directors, and experienced investigators to develop among junior colleagues and students the necessary respect for careful recording and preservation of primary data.

5. The faculty is encouraged to engage in free discussion of results, to share data and techniques, and to avoid secrecy in the conduct of original investigations. It should be remembered that independent confirmation of results is important in direct proportion to the potential significance of the results in question and may be crucial to the establishment of new concepts.

6. Faculty members are responsible for the quality of all reports based on their own efforts or on the collaborative work of students, technicians, or colleagues, especially those which bear the faculty member's name. The term “reports” as used here includes, but is not limited to, manuscripts submitted for publication and abstracts submitted for presentation at meetings. The same standards of scientific integrity apply to abstracts as to full-length publications. Abstracts or other reports of preliminary findings should indicate clearly that the findings are preliminary. No faculty member shall allow his or her name to be used on any report containing results for which that faculty member cannot assume full professional and ethical responsibility.

7. Any UAB employee (including, but not limited to, regular and adjunct faculty, fellows, technicians, and student employees) or any UAB student who has reason to suspect any other employee or student of misconduct with regard to the conducting or reporting of research has the responsibility of following up these suspicions in accordance with the procedures outlined below. For purposes of this policy, “misconduct” means fabrication, falsification, plagiarism, or other practices which seriously deviate from those that are commonly accepted within the scientific community for proposing, conducting, or reporting research. It does not include honest error or honest differences in interpretations or judgments of data. Intentionally withholding information relevant to the investigation of an alleged case of misconduct, intentionally pressuring others to do so, or bringing malicious charges against another individual shall itself be considered misconduct. Also, any act of interference, retaliation, or coercion by a UAB employee against a student or employee for using this policy is prohibited and is itself a violation of this policy.

Procedures To Be Followed

The “Scientific Misconduct Allegation Review Checklist” is to be used in conjunction with the procedures in this section.

It is the responsibility of student employees, trainees, fellows, faculty members, staff members, or other employees who become aware of misconduct in research and other scholarly activities to report such misconduct to one of the following: (a) their department/unit head, (b) the dean of the school in which their department/unit is located, or (c) the UAB Scientific Integrity Officer. In the case of graduate students or of trainees at any level, such evidence also may be reported to the Dean of the Graduate School.

The individual receiving such evidence of misconduct must immediately report such evidence and the allegation of misconduct to the UAB Scientific Integrity Officer, the department/unit head and the dean of the unit in which the alleged misconduct occurred, and the Provost. If the UAB Scientific Integrity Officer determines that the allegation warrants initiation of the inquiry process, the inquiry shall be initiated immediately, and the Office of Counsel shall be informed.

Allegations of this nature are very serious matters, and all parties involved should take measures to assure that the positions and reputations of all individuals named in such allegations and all individuals who in good faith report apparent misconduct are protected. Details of the charge, the name of the accused, the identity of the individual bringing suspected fraud, and all other information

about the case shall be kept confidential as far as possible, compatible with investigating the case. Revealing confidential information to those not involved in the investigation shall itself be considered misconduct.

Because UAB is interested in protecting the health and safety of research subjects, students, staff, and faculty and because UAB is responsible for protecting sponsored research funds and for ensuring that those funds are spent for the purposes for which they are given, if the situation warrants it, interim administrative action may be used prior to conclusion of either the inquiry or the investigation to provide for the protection of individuals and funds in accordance with existing UAB policy. Such action includes, but is not limited to, administrative suspension; re-assignment of student(s); involvement of the Institutional Review Board, the Institutional Animal Care and Use Committee, and the Office of Internal Audit-UAB; or notification of external sponsors when required by federal regulations.

Initial Inquiry

For purposes of this policy, "inquiry" means information gathering and initial fact finding to determine whether an allegation or apparent instance of scientific misconduct warrants an investigation.

1. The department/unit head or dean shall investigate immediately the charges through an inquiry process, including an interview with the suspected individual. The person conducting the inquiry shall ensure that individuals with the necessary and appropriate expertise are consulted concerning technical aspects of the activities in question. At least one of those individuals must be from outside the suspected individual's department. The record of the inquiry shall document the review of relevant evidence.

The department/unit head or dean conducting the inquiry keep the UAB Scientific Integrity Officer informed and may request assistance from the UAB Scientific Integrity Officer. The UAB Scientific Integrity Officer shall keep the Office of Counsel informed during the inquiry process, and the Office of Counsel shall provide advice concerning procedural matters. In order to ensure that a real or apparent conflict of interest does not exist, the UAB Scientific Integrity Officer shall review the selection of persons to be involved in the inquiry. If it is determined that a conflict of interest exists, the UAB Scientific Integrity Officer is responsible for designating who will be involved in the inquiry.

If UAB plans to terminate an inquiry for any reason prior to completion of the normal progression of such an inquiry, the UAB Scientific Integrity Officer shall notify the federal Office of Research Integrity and shall include in that notification a description of the reasons for termination of the inquiry.

UAB will make every effort to complete the inquiry within 60 days of its initiation. If the inquiry extends beyond 60 days, the reasons for the extension will be documented by the UAB Scientific Integrity Officer and will be retained with the record of the inquiry.

The written report of the inquiry shall state what evidence was reviewed, shall indicate the relevant expertise of the persons reviewing the evidence, shall summarize the relevant interviews, and shall include the conclusions of the inquiry. The individual(s) against whom the allegation was made shall be given a copy of the inquiry report and shall have an opportunity to make written comment regarding the report. This report, including a conclusion as to whether there is reasonable cause to believe that misconduct has occurred, shall be forwarded to the provost (with a copy to the UAB Scientific Integrity Officer) through the appropriate dean who should make whatever comment or recommendation is deemed warranted.

2. The Provost, with the advice and counsel of the UAB Scientific Integrity Officer and others as appropriate, shall decide whether to close the matter or to appoint an Investigating Committee. If findings from the inquiry provide sufficient basis for conducting an investigation, the investigation must be started within 30 days of completion of the inquiry. The written report of the inquiry will be made available to the Investigating Committee.

3. If the Provost determines that it is not necessary to undertake an investigation, the Provost will report to the President the reasons for this decision and the findings of the inquiry. The report will be maintained in a secure manner for at least 3 years by the Office of the UAB Scientific Integrity Officer.

Investigation

For purposes of this policy, "investigation" means the formal examination and evaluation by a committee of all relevant facts to determine if scientific misconduct has occurred.

1. The Investigation Committee is appointed by the Provost and will elect its own chairperson. Members of the Committee shall consist of at least three tenured faculty members who have the expertise to deal with technical aspects of the activities in question. At least two of these faculty members must be from outside the suspected individual's department. The Provost shall take precautions not to appoint any committee member who has a real or apparent conflict of interest with the outcome of the investigation.

The chairperson shall conduct meetings of the Investigating Committee as frequently as required in order to determine whether or not the activities in question do indeed constitute misconduct. All such meetings and the deliberations thereof shall be held in confidence to protect the affected individual or individuals. Those accused of misconduct shall be

given a written summary of the charges and supporting evidence and shall be afforded an opportunity to appear before the Committee to comment on allegations. The accused may be represented by counsel. The Office of Counsel shall be kept informed of the investigation process and shall advise the Investigating Committee concerning procedural matters.

The Committee should take no more than 60 days to complete its review and to prepare its report for submission to the President. UAB will make every effort to complete all investigative matters within 120 days from initiation of the investigation. This includes the work of the committee, preparing the report, submitting the report to the President, making the report available for comment by the subject(s) of the investigation, and submitting the final report to the federal Office of Research Integrity. If the investigation cannot be completed within 120 days, the UAB Scientific Integrity Officer shall request an extension from the federal Office of Research Integrity. The extension request will include an explanation for the delay, an interim report on progress to date, an outline of what remains to be done, and an estimated date of completion.

If UAB plans to terminate an investigation for any reason prior to completion of the normal progression of such an investigation, the UAB Scientific Integrity Officer shall notify the federal Office of Research Integrity of UAB's plan to terminate the investigation and shall include a description of the reasons for such termination.

2. The President, based on the Investigating Committee's findings and responses to those findings, shall determine what actions are appropriate. Appropriate actions may include discharge from employment at UAB or expulsion from UAB in the case of a student. Such actions shall be consistently applied throughout UAB. The President will notify the UAB Scientific Integrity Officer who in turn will work with the Office of Grants and Contracts Administration to notify any agencies or foundations supporting the research in question and any journals or other publications which may have been affected by the publication of results of that research.

3. The UAB Scientific Integrity Officer shall submit the report of the investigation to the federal Office of Research Integrity and shall include in that report the policies and procedures under which the investigation was conducted, how and from whom information was obtained relevant to the investigation, the findings of the investigation, and the basis of the findings. Also included will be a description of any sanctions taken by UAB and the actual text of, or an accurate summary of, the views of any individual(s) found to have engaged in scientific misconduct.

Additional Notifications

1. If the Provost initiates a formal investigation, any agency or foundation supporting the research in question shall be notified by the Director of the Office of Grants and Contracts Administration upon receipt of information from the UAB Scientific Integrity Officer. Any such agency or foundation shall be notified immediately if it is ascertained at any time during the initial inquiry or subsequent investigation that there is an immediate health hazard involved; an immediate need to protect federal funds or equipment; an immediate need to protect the interest of the persons making the allegations, the individuals who are the subject of the allegations, or any co-investigators and associates, if any; a probability that the alleged incident is going to be publicly reported; or a possibility that criminal violation has occurred. The agencies also will be given interim reports of any investigation should the circumstances warrant.

2. If the initial inquiry or the subsequent investigation indicates that the allegations are unsubstantiated, UAB will make diligent efforts to restore the reputation of those accused at UAB, with any involved funding agencies and elsewhere.

3. Any involved funding agencies shall be notified of the final outcome of any investigation.

Attachments

The form entitled "Scientific Misconduct Allegation Review Checklist" as attached to this policy is to be used as a guideline and summary of documentation related to reviews of allegations of violations of this policy. The form may be revised from time to time without affecting the policy itself.

Copyright Policy

September 18, 2006

Purpose

The University of Alabama at Birmingham (the "University") is dedicated to instruction, research and service to benefit society and encourages its faculty, staff and students to carry out scholarly endeavors in an open and free atmosphere, and to publish the results without restraint, consistent with applicable law and policy. The University is committed to complying with all applicable laws regarding copyright. The purpose of this policy is to clarify individual rights and institutional rights associated with ownership of copyrights and with the distribution of benefits that may derive from the creation of various types of intellectual property. This policy applies to creators of copyrightable works, whether such creators are University faculty, staff or students.

Information and Education

To carry out the purposes of this policy, the University shall:

- Provide the University community with information about copyright law, with emphasis on the application of fair use in academic setting, and such information shall be provided in accordance with the provisions of the Technology, Education and Copyright Harmonization (TEACH) Act and such other applicable laws and regulations.
- Provide web-based resources on copyright laws in general and on the application of fair use in specific situations.
- Make copyright and fair use informational resources available in the University's libraries.

Ownership

Ownership of the various rights associated with copyright is dependent upon several factors, listed below. As a general rule, creator(s) retain all rights to copyrightable works, unless subject to the conditions discussed in this section.

A. Individual efforts: The copyrightable work produced by faculty, staff or students on their own initiative shall be the exclusive property of such individual(s) unless the work was specifically commissioned or assigned (refer to Section B), or unless the work was prepared under the terms of a contract or grant, or unless preparation involved substantial use of University resources. Except in the cases covered in paragraphs B through E below, the ownership of books, scholarly articles/monographs, trade publications, maps, charts, articles in popular magazines and newspapers, novels, nonfiction works, supporting materials, artistic works, syllabi, lecture notes, and like works will reside with the creator(s) and any revenue derived from their work will belong to the creator(s).

B. University assigned efforts: The copyright in a copyrightable work prepared by faculty, staff or students in the course of their regular employment duties or by special direction or commission shall be the property of the University. Such condition of employment or such directions shall be in writing and shall be agreed to in advance by both the University and the individual. A faculty member's general obligation to produce scholarly and creative works does not constitute a University assignment in the context of this paragraph. Works created by students in the normal course of their coursework, such as a term paper, thesis/dissertation or similar scholarly work, does not constitute a University assignment in the context of this paragraph. A copyright agreement provided for the sharing of royalties, as discussed later in this policy, may, at the discretion of the University, be entered into by the University and the individual in regard to the work.

C. Sponsor supported efforts: Copyright ownership in copyrightable materials developed during work supported partially or in full by an outside sponsor, through a contract or grant with the University, is determined by the applicable provisions of such contract or grant. In the absence of any governing provision, the ownership of any copyright shall be determined in accordance with paragraphs A, B, D or E herein.

D. University-assisted individual efforts: A copyrightable work that is developed with substantial use of University resources and is not sponsor-supported hall be the property of the University. "Substantial use" of institutional resources may include the commitment of staff, faculty or material support in the creation of the copyrightable work, but does not include the ordinary use of the University's libraries, faculty time, faculty offices, departmental office equipment, routine secretarial support or University owned personal computers. Should a question arise as to whether substantial use of University resources has occurred or may occur, a determination will be made by the Provost of his or her designee.

E. Distance Learning: With respect to distance learning materials, ownership of such materials shall be determined in accordance with the provisions of paragraphs A through D above.

F. Shop Rights: "Shop Rights" means a non-exclusive, non-transferable, royalty-free license to reproduce, distribute, publicly perform, publicly display, or make derivative works of the copyrighted work, for educational or research purposes only. Except for textbooks and articles published in scholarly journals, the University shall have shop rights to copyrighted materials developed by its faculty, staff and students, pursuant to paragraph A above, and faculty, staff and students of the University shall have shop rights to copyrighted materials owned by the University, pursuant to paragraphs B and E above; provided, however, that no faculty, staff or student shall use any shop rights hereunder in competition with the University while such individual is employed by the University.

Disclosure

There is no mandatory disclosure requirement for works created by faculty, staff or students for works that meet the criteria set forth in paragraph A

above. For works that meet the criteria set forth in paragraphs B, C, or D, the creator must disclose the existence of the work during or immediately after its creation. Disclosure shall be made in writing to the creator's unit leader and to The UAB Research Foundation. If any questions exist regarding whether disclosure is required, contact The UAB Research Foundation.

Commercialization/Distribution of Net Revenues

All costs and revenues from the commercialization of any intellectual property hereunder, owned by the University, shall be distributed in accordance with the University's Patent Policy (*approved by the Board of Trustees on February 23, 1980, and revised on January 14, 1986*). Nothing contained in this policy shall be construed to supersede the University's Patent Policy or Computer Software Policy (*approved on January 14, 1986, corrected on may 28, 1986, and edited February 26, 1996*), and the terms of the University's Patent Policy and Computer Software Policy shall control in the case of any conflict between those policies and this policy.

Computer Software Copying and Use Policy

July 13, 1999

Introduction

Respect for the intellectual work of others is a tradition at UAB. UAB values the free exchange of ideas but not plagiarism or the unauthorized copying of computer software, including programs, applications, and data. Under federal copyright law, it is illegal to make a copy of computer software except for archival or back-up purposes without the permission of the copyright holder. Therefore, unauthorized copying of computer software or its documentation is illegal for substantial damages. The *person* responsible may be held liable.

All state and federal laws and UAB policies must be adhered to in the use of UAB's computer equipment and systems. Any use of UAB equipment that violates copyright law or licensure contracts, that compromises or attempts to compromise the integrity of UAB-based or any other computers or computer systems, or that involves gambling or other illegal activity also is forbidden and may subject the computer user to criminal, civil, and/or UAB sanctions. Any use of UAB's software, including shareware, must comply with all copyright laws and with the terms of the license granted by the software owner, including any prohibitions against simultaneous use on multiple computers. Unauthorized use or copying of any software (whether or not owned by UAB) is not permitted on any UAB equipment.

This policy covers computer software which has been purchased by, acquired by, donated to, and/or licensed to, UAB and includes software that is bundled with, or preloaded on, computer systems purchased by UAB. It also includes software downloaded from networks (including the Internet), and in those instances it is important for UAB users and departments/units to ensure that any such commercial software or shareware may legally be downloaded, that the software is freeware, or that the software is in the public domain. UAB and individuals must comply with all terms and conditions of software downloaded from networks, including the Internet.

If computer software carries a UAB copyright, it may be used and distributed by UAB as long as such distribution is in keeping with the desires of the originating department/unit and is not in violation of the "Computer Software Policy." If a UAB determination of interest in licensing the software is pending, the software would be considered non-UAB software for the purposes of this policy until such time that UAB determines its interest in licensing the software. This policy does not alter the categories of software and the rights pertaining thereto as indicated in the UAB "Computer Software Policy."

Definitions

For purposes of this policy, the following definitions apply:

"*Computer software*" includes, but is not limited to, purchased or commercial software, sound, graphics, images, or datasets; shareware, freeware; and electronically stored documentation and the media that hold it. ***Not*** included in the definition as used in this policy are noncopyrighted computer data files that have no significance beyond the individual or department/unit.

"*UAB software*" is defined as computer software purchased or acquired by a UAB department or unit or by a UAB employee as part of his or her role at UAB. It includes software donated to UAB or software purchased by related foundations and donated for use by UAB. It includes computer programs written by UAB employees or students if creating such software is a UAB-associated effort.

"*Non-UAB software*" is defined as computer software purchased, acquired, or created by an individual(s) and not officially acquired by a UAB department or unit.

"*UAB-associated efforts*" (related to computer software development) is defined relative to the UAB "Computer Software Policy" as UAB-assisted efforts and UAB-assigned efforts.

Policy Statement

It is the policy of the University of Alabama at Birmingham to comply with copyright law and license agreements entered into with vendors or authors of computer software. No illegally obtained

or illegally copied (often referred to as "pirated") computer software is allowed at UAB. UAB does not, and will not, condone illegal copying of computer software or the use of illegally copied or obtained computer software. Anyone connected with UAB who causes unauthorized computer software to be installed or loaded in connection with his or her role at UAB is in violation of this policy.

Whenever a staff member, faculty member, contractor of services to UAB, student, or visitor to the campus, in connection with his or her role at UAB, receives a copy of computer software from UAB, requests software to be loaded or installed on a UAB computer, or loads or installs computer software on a UAB computer, he or she must abide by the stipulations included in the license agreements associated with that computer software. It is the responsibility of anyone requesting installation of, or installing or loading, computer software onto a UAB computer to be familiar with the license agreements for that computer software, as documented by the vendor. *Individual employees are accountable for software they load or install on UAB computers or which they supply for loading or installing on the department's or unit's computers or networks. They also are accountable for any existing software on UAB computers over which they have control*.

The installation or use of non-UAB software on UAB computers is prohibited unless approved in writing by the department/unit head. The department/unit head may choose to give blanket permission to an individual on a per-machine basis. The non-UAB software should be free of viruses or other destructive mechanisms to the greatest extent possible and must be used for legitimate UAB purposes directly related to UAB's instruction, research, and service activities.

Taking UAB-owned computer software home or elsewhere off campus to use on a non-UAB computer, even if the purpose is to perform UAB-related work, also is prohibited unless such use is authorized in writing and is permitted in the license agreement associated with the computer software. This constitutes theft of UAB property unless the software license specifically allows concurrent use and such use has been approved in writing by one's supervisor or department/unit head. If the software license does not allow such use and a department/unit requests an employee to perform such work, the department/unit should purchase a separate copy of the software for installation on the employee's computer.

A computer lab or a department/unit with publicly accessible computers which allows non-UAB software to be installed *temporarily* on the network or computers for purposes such as completing class assignments, printing documents, converting document formats, etc., must have documented procedures in place for removing any non-UAB software installed on the computers. This practice is not considered a violation of this policy as long as use of the non-UAB software on such UAB computers is directly related to UAB's instruction, research, and services activities.

Proof of Ownership of Software

Computer software purchased by, and/or licensed to, UAB is an institutional resource and, therefore, should be safeguarded and accounted for in the same manner as other UAB resources. All commercial computer software license agreements, records of purchase, and original and back-up disks (or other software distribution media) must be kept by the department/unit in a safe place and must be made available for review or inspection. All license or use agreements for shareware or freeware computer software also must be available for inspection. Likewise, any written authorizations for the use of UAB-owned software on non-UAB computers must be available for inspection.

The following are examples of documents which can be used to show ownership or right to use software:

A. The dated purchase order, invoice, or sales receipt for purchased software or proof of a site-license agreement covering all copies in use or accessible by users in the department.

B. The original software distribution media.

C. The original documentation.

D. Vendor software that is bundled with, or preloaded on, computer systems purchased by UAB, an itemized listing of the software on the dated purchase order, invoice, or sales receipt for the computer.

E. For software downloaded from external networks or acquired from noncommercial sources, a statement indicating the nature of the software (for example, downloadable commercial software, shareware, freeware, or public domain), the use and registration requirements for the software, and proof of registration of the software, when applicable. Acquisition of software universally known to be available free to educational institutions and/or to the general public does not have to be documented. (Note: Examples of statements to document legality of downloaded software include, but are not limited to, receipts for payment of shareware registration, printed copies of e-mail messages if the user is required to e-mail the author, screen prints of the status of freeware or public domain software, etc.) It is recognized that the extent of documentation needed for freeware or public domain software will not be as extensive as for other types of software.

These proofs of purchase/ownership must cover *all* copies in use or accessible by users in the department.

Software License Registration

Registration with the author(s) or vendor(s) of computer software purchased by, or received from,

UAB for installation on a UAB computer in connection with one's role at UAB must include UAB or one's department/unit as the licensee.

Applicability

This policy applies to all staff, faculty, students, contractors of services to UAB, and visitors.

Disciplinary Action

A violation of this policy by employees, including faculty, shall result in disciplinary action according to established UAB disciplinary procedures up to, and including, discharge for nonfaculty employees and termination for cause for faculty employees. A violation of this policy by a student constitutes nonacademic misconduct and the student will be subject to established disciplinary action.

Implementation

The Vice President for Information Technology is responsible for overall procedures to implement this policy. The executive Director of the UAB University Hospital is responsible for specific procedures to cover implementation in Hospital departments/units.

Patent Policy

June 19, 2009

Purpose

In view of the far-reaching research on the various campuses of The Board of Trustees of The University of Alabama (hereinafter referred to as University), it is inevitable that new discoveries and inventions will be made. The members of the Board of Trustees (hereinafter referred to as the Board) recognize the importance of obtaining the greatest public benefit and usefulness from the products of the University's scientific research and inventiveness, and that the protection and control provided under patent laws or other legal means for the protection of property rights may be necessary to obtain this goal. It is further recognized that employees of the University need assistance in determining and evaluating patentability and in prosecuting patent applications for or otherwise protecting inventions made by them. Furthermore, many such inventions involve equities beyond those of the inventor since the use of University facilities, the assignment of duties as a condition of employment, and the use of research funds with contractual obligations regarding patent rights give rise to questions concerning the rights and equities of all concerned. The purpose of this patent policy is to establish a mechanism to serve the public benefit and interest, to determine and apprise all concerned parties of relative rights and equities, to facilitate patent applications, the licensing of inventions, the equitable distribution of any royalties or other financial returns, to provide necessary uniformity in patent matters, and to provide for adequate reporting of patent activities.

Policy and Procedure

A. It shall be the policy of the Board to encourage the concept that patentable inventions produced at the University shall be used for the greatest possible public benefit and to provide every reasonable incentive to the faculty, students and staff for the disclosure, evaluation and dissemination of such inventions. When University support makes the research effort possible or when it provides support for the development of a patentable invention, it is reasonable for the University to participate in the fruits of such development, including reimbursement for its costs. To that end, the University encourages the procurement of patents for such inventions and the licensing or other commercialization thereof in the interest of the public, the inventor, and the University.

B. The President of each campus shall appoint an officer or Patent Committee or designate a non-profit organization established for the benefit of the campus to administer this policy. Each campus President may promulgate additional regulations and guidelines pursuant to this Policy to administer this policy within his/her respective campus.

C. This patent policy of the University, as amended from time to time, shall be deemed to be a condition of employment and contractual obligation, both while employed and thereafter, of every employee of each campus, including student employees, and a condition of enrollment and attendance and contractual obligation, both while in attendance and thereafter, by every student at each campus.

D. Any invention or discovery (1) which is the result of research carried on by or under the direction of an employee of a campus of the University and/or having the costs thereof paid from funds provided by, under the control of or administered by a campus of the University, or (2) which is made by an employee of a campus of the University and which relates to the employee's field of work, or (3) which has been developed in whole or in part by the utilization of resources or facilities belonging to a campus of the University, shall be the property of the applicable campus of the University. The applicability of the above stated criteria to any invention or discovery will be determined at the sole discretion of the President of the respective campus of the University or his/her designee.

E. As a condition of their employment by or enrollment at a campus of the University, each faculty member, employee and student agrees that

he/she shall be contractually bound by this patent policy as implemented by the respective campuses of the University and shall report to the officer or non-profit organization so designated by the President of the campus of the University to manage and commercialize such inventions and discoveries with respect to that campus, any invention or discovery which such faculty member, employee or student has conceived, discovered, developed and/or reduced to practice by them or under their direction at any time following their initial appointment by, employment by, or enrollment with that campus of the University. All inventions and discoveries that meet the criteria of II.D. shall be automatically assigned to the University for the benefit of the appropriate campus of the University immediately upon creation or discovery or reduction to practice of the invention or discovery. The President of each campus of the University is authorized to further assign any invention or discovery it is deemed to own pursuant to this policy to a designated nonprofit organization established for the benefit of the respective campus of the University, which said assignment shall be conditioned on full compliance with this policy, regulations promulgated hereunder by the Board or by the President of the respective campus of the University, and appropriate state and federal law.

F. If the invention or discovery is one which is determined to be owned by a campus of the University, the President of the applicable campus or his/her designee shall further evaluate the invention or discovery and determine if and how best to develop, commercialize and protect the invention as he/she deems appropriate, including, but not limited to, applying for patent protection, or requesting further development of the invention or discovery. In making this determination, the benefits that might accrue to both the campus of the University and the inventor(s) shall be considered. The designee shall act promptly in carrying out these duties so that the rights of the inventor(s) and the campus of the University may be protected.

G. If it is determined that the invention or discovery is one which is owned by the University pursuant to this policy but is one in which a campus of the University has no interest in retaining ownership, a campus of the University (or the non–profit organization to which an invention may have been assigned in accordance with the terms of this policy) may, but is under no obligation to, release its ownership rights to the inventor(s) on terms and conditions determined by the President or his/her designee, subject to any third party rights.

H. In consideration of the automatic assignment of ownership set forth in this policy, the Presidents or their designees are authorized to pay to the inventors, their heirs or assigns, a percentage of the royalties, fees, or other financial returns received by the campus of the University (or the non–profit organization to which an invention may have been assigned in accordance with the terms of this policy) from such invention after a deduction of fifteen percent (15%) thereof for overhead costs, plus a deduction for costs of patenting and protection of intellectual property rights and any unusual expenses paid by the campus or its non-profit designee or the inventor (which have been approved by the campus or its non-profit designee). Each campus President shall be responsible for the development of a policy governing the percentage of royalties, fees, and other financial returns on an invention paid to the inventor and governing the internal distribution of the campus of the University's share of such financial returns.

I. It is understood that many research contracts, grants, and consulting agreements from or with the United States Government or its agencies, corporations, or individuals contain ownership of intellectual property clauses that may be at variance with this policy but which, if agreed to, require compliance. Such documents which are at variance with this policy may be referred to the appropriate designated officer of the campus for recommendations prior to approval.

J. Annual reports of patent matters will be made to the Chancellor for his/her information and that of the Board within thirty days (30) following the end of each fiscal year, to include as a minimum identification of each patent and patent applied for, the distribution of patent revenue including the share going to the inventor, and the expenses of obtaining and managing patents. The Chancellor may prescribe appropriate formats for such reporting.

Employee Falsification of UAB Records and Documents

April 20, 1998

NOTE: Falsification of documents and records by a student who is not functioning in a UAB employee capacity is considered nonacademic misconduct and is handled in accordance with regulations covering nonacademic misconduct. See *Direction Student Handbook*.

Introduction

As a health-care, research, and educational institution, the University of Alabama at Birmingham is acutely interested in issues relating to the integrity of its employees.

For purposes of this policy, falsification of records exists when a UAB employee is discovered to have provided false information on the

employment application; to have failed to disclose requested information; knowingly to have falsified information; or knowingly to have recorded false information on any UAB document or record, regardless of format and including electronic communications. The following is a partial list of infractions which are specifically prohibited: falsifying information on an application for initial employment or for transfer; falsifying employee recruitment/credential records; falsifying employee expense account records or other reimbursement records; falsifying personnel/ payroll documents (including, but not limited to, pay records, time sheets, or other types of time records); clocking the time card/time record of another employee or completing and submitting for approval the time sheet/time record of another employee; falsifying health records or vacation/sick leave records; falsifying research records, medical records, or departmental administrative records; and falsifying student records (including, but not limited to, admissions application materials, transcripts, grade sheets, registration documents, and student identification documents).

Policy Statement

Falsification of UAB records or documents is prohibited. Any knowing or negligent misrepresentation of a material fact or any failure to make a complete disclosure of any requested information are causes for immediate discharge without notice or pay in lieu of notice for nonfaculty employees or termination for cause for faculty employees. Any exception to the immediate and automatic discharge of nonfaculty employees for these reasons must be approved in writing by the Chief Human Resources Officer. Any exception to the recommendation of termination for cause for faculty for these reasons must be approved in writing by the Provost and by the Chief Human Resources Officer.

Implementation

The Office of the Vice President for Financial Affairs and Administration is responsible for procedures to implement this policy as it relates to employee or departmental administrative records. The Office of the Provost is responsible for procedures to implement this policy as it relates to academic records, research records, or faculty recruitment/credential records.

UAB Student Records Policy

The General Education Provisions Act, Section 438, as amended, and the regulations promulgated for the enforcement of the act, found at 45 Federal Register 30911, as amended at 45 Federal Register 86296, provide that all students enrolled or previously enrolled at the University of Alabama at Birmingham have the following rights in relation to their educational records:

I. General Policy

No information from records, files, or other data directly related to a student, other than public information defined below, shall be disclosed to individuals or agencies outside the university without the written consent of the student, except those disclosures set forth in paragraph IX.

II. Definition of Educational Record

Student educational records are defined as those records, files, documents, and other material which contain information directly related to students and which are maintained by UAB or a party acting for UAB. Records of instructional, supervisory, and administrative personnel which are in the sole possession of the maker and accessible only to the maker or a substitute are specifically excluded from this definition of educational record. Educational records of students are not available to UAB Police personnel, and records of the University Police, which, at UAB, are maintained separately from educational records, are maintained solely for purpose of law enforcement, and are not disclosed to individuals other than law enforcement personnel of the same jurisdiction, are not part of the educational record. Records which are made or maintained by physicians, psychiatrists, psychologists, or other professionals or paraprofessionals and which are maintained in connection with treatment and are not available to anyone else are also excluded from a student's educational record, but such records are available to another physician or appropriate professional of the student's choice if requested. Records which only contain information relating to a person after that person is no longer a student are not considered part of the student's educational record.

III. Definition of Student

For the purpose of this policy a student is defined as any individual currently or previously enrolled in any academic offering of UAB. It does not include prospective students.

IV. Public Information

The following is a list of public information which may be made available by the university without prior consent of the student and which is considered part of the public record of the student's attendance: Name, telephone number, email address, date and place of birth, major field of study, participation in officially recognized activities and sports, dates of attendance, degrees and awards received, and institution most recently previously attended. The information will not be made available if a student

directs a written instruction to the appropriate records official prior to the end of the registration period for any given term.

V. Types and Location of Records

Each school maintains a file on each student enrolled, containing applications, grade reports or other performance evaluations, and correspondence. Some departments or programs maintain similar files. The counseling service, career services, and financial aid offices maintain a file on students who use those services. The university has designated the following officials as responsible for student records within their respective areas: University Registrar, Room 207, Hill University Center; Dean, Graduate School, Room 511, Hill University Center; Director of Student Affairs, School of Dentistry, Room 207, School of Dentistry Building; Assistant Director/Registrar,, School of Medicine, Room P100, Volker Hall; Director of Student Affairs, School of Optometry, Room 104, School of Optometry Building; The above shall hereinafter be referred to as "records officials." Each of these records officials is responsible for maintaining a listing of student records within such records official's area of responsibility, indicating the location and general content of the records. Any student request concerning records or files, including requests that public information not be disclosed, requests for disclosure to third parties, and requests for access by the student should be directed to this official. Forms for all such requests may be obtained from these officials. These persons will also act as hearing officers when the content of a record is challenged as provided below.

VI. Disclosure of Student Records to the Student

The student is accorded the right to inspect, in the presence of a university staff member, records, files, and data primarily and directly related to the student. To inspect a file a student should go to the office of the appropriate records official and initiate a request in writing. If a student desires to obtain copies of the items in the educational record rather than personally reviewing the record, the written request to the records official for copies must be signed and notarized to prevent disclosure to persons other than the student. A time for inspection shall be granted within forty-five days of the date of the request, and copies will be mailed within the same time period. Copies shall be made and provided to the student at a cost to the student equal to actual cost of reproduction and payable in advance.

The right of inspection does not include financial statements of parents, confidential recommendations placed in the file prior to January 1,1975, provided that such recommendations were solicited with a written assurance of confidentiality or sent or retained with a documented understanding of confidentiality and used only for the purpose solicited, and other confidential recommendations, access to which has been waived by the student in accordance with paragraph VIII.

VII. Challenging the Contents of the Record

UAB will respond to any reasonable request for an explanation or interpretation of any item in a student's file. Requests for such explanation or interpretation should be addressed in writing to the appropriate records official.

If, after inspecting a record, a student believes that information contained in the educational record is inaccurate or misleading or violates his or her privacy, the student may request that the record be amended by presenting such request in writing to the appropriate records official. A request that the record be amended shall be answered by the records official within fifteen days of its receipt with information that the record has been amended as requested or that the record has not been amended and that the student has a right to a hearing on the matter. A written request for a hearing should be addressed to the appropriate records official as listed in V, who will set a date and time for hearing with reasonable notice of same to the student within forty-five days of receiving the request.

The request for hearing should identify the item or items in the file to be challenged and state the grounds for the challenge, e.g., inaccuracy, misleading nature, inappropriateness. The records official shall examine the contested item, shall hear the person responsible for placing the item in the file if appropriate, and shall examine any documents or hear any testimony the student wishes to present. A student may be assisted or represented by individuals of his or her choice, including an attorney, at his or her own expense. The records official may decide that the item should be retained or that it should be deleted or altered. The records official shall issue a written decision, based solely on the evidence presented at the hearing, within ten days of the conclusion of the hearing. If the decision is adverse to the student, the notice of decision shall include a statement that the student has the right to place a statement in the record commenting on the information and/or setting forth reasons for disagreeing with the decision.

VIII. Waiver of Access

UAB may request that a student waive the student's right to inspect confidential recommendations respecting that student's application for admission, provided that the student be notified, upon request, of the names of all those providing the recommendations, the recommendations are used only for the purpose solicited, and the waiver is not a condition of admission or any other benefit.

Confidential recommendations respecting application for employment or the receipt of an honor or other recognition may also be waived.
A waiver may be revoked with respect to actions occurring after revocation by so notifying the records official in writing.

IX. Providing Records to Third Parties
The general policy of UAB is to refuse access to or disclosure of information from student records to third parties without the written consent of the student. Should a student wish to have such records released, a signed and dated written request must be directed to the proper records official, specifying the records to be released, the reason for release, the party or class of parties to whom records are to be released, and a request for copies to the student, if desired. UAB will then transfer or grant access to the information. The transferred information shall contain a statement that the information may be used by the receiving party or, if an organization, by its officers, agents, and employees for the purpose requested, but that the party shall not transfer the information to any other party except with the written consent of the student. A charge not to exceed the actual cost of reproduction will be assessed against the student when copies are made for the party or the student.

Student records are available to the following persons with the accompanying conditions without written consent of the student:

1. Instructional or administrative personnel whose duties include responsibilities to students which in the institution reasonably require access to student records.
2. Officials of other schools in which a student seeks to enroll. UAB will make a reasonable attempt to notify the student of the transfer, as well as the student's right to a copy, upon request, and the right to a hearing to challenge the contents if desired.
3. Certain representatives of federal departments or agencies or state educational authorities as provided by the law. In absence of consent or specific authorization by federal law of the collection of personally identifiable data, data collected by excepted officials shall be protected in a manner which will not permit personal identification of students and parents by other than those officials, and personally identifiable data shall be destroyed when no longer needed.
4. Financial aid officers or their assistants in connection with the application for or receipt of financial aid, provided that personally identifiable information may only be disclosed for the purpose of determining eligibility, amount, and conditions and to enforce terms and conditions.
5. Organizations conducting studies for administrative evaluation, tests, etc., provided that studies are not conducted in a manner which will permit personal identification of students or their parents by other than representatives of the organization and that the information will be destroyed when no longer needed for the purposes collected.
6. Accrediting organizations.
7. Other appropriate persons in an emergency to protect health or safety of students or others. In determining appropriateness of disclosure, consideration will be given to the seriousness of the threat to health or safety of the student and others, the need for information to meet the emergency, whether the parties requesting information are in a position to deal with the emergency, and the extent to which time is of the essence.
8. In response to lawful subpoena or court order.

UAB will keep a record, indicating the name and legitimate interest, of all disclosures except those made to a student, those made pursuant to written consent, those designated as public information, and those made to persons at UAB with a legitimate educational interest. This record of disclosure will become a part of the educational record, subject to inspection and review.

X. The UAB Student Records Policy shall be published in the catalog of each school, and a copy shall be displayed prominently on a bulletin board in each school. In order to comply with the requirement that UAB give annual notice of this policy to enrolled students, a short notice of the policy shall be included in the Class Schedule for each term.

XI. Any student who believes that UAB has violated his or her right to access or privacy of educational records as established by the Family Education Rights and Privacy Act of 1974, as amended, the accompanying regulations published at 45 Federal Register 30911, as amended at 45 Federal Register 86296, and this policy may address a complaint to:

The Family Educational Rights and Privacy Act Office
Department of Education
400 Maryland Avenue, S.W.
Washington, D.C. 20202

UAB Residency Determination and Appeal Process

May 17, 2012

UAB students are governed by the **Board of Trustees' Non-Resident Tuition Policy**, which addresses non-resident tuition, certification of residency status by campus officials, and establishment of campus procedures to administer an appeals process. The following guidelines implement certain provisions of the Board policy.

Implementation Guidelines

The Office of the Registrar, the Graduate School, and the admissions/registration offices of the professional schools, as appropriate, are designated as the offices empowered at UAB to determine and certify "resident" or "non-resident" student status. These offices are responsible for documenting each residency status evaluation and for maintaining th records used to substantiate that evaluation. As the provisions of Section II. 3 of the Board policy indicate, "though certification of an address and intent to remain in the state indefinitely are prerequisites to establishing status as a resident, ultimate determination of that status shall be made by the institution by its evaluation of the presence or absence of connections with the state of Alabama." However, meeting the specific criteria included in Section II of the Board policy may not in all circumstances result in certification as a "resident student." All facts and circumstances surrounding a person's residency determination are considered, and no one fact is determinative.

Also, according to the provisions of the Board policy, UAB has been given the authority to expand, and has by separate Board resolution expanded, the definition of "resident student" to encompass all the categories in Sections III. A and III. B of the Board policy. In general, international students who have not been issued a U.S. resident alien card may not be considered for residency status for tuition purposes, unless they hold a graduate assistantship or fellowship and meet certain criteria. Internationla students who have been issued a U.S. resident alien card will be considered for residency status for tuition purposes in the same manner as are U.S. citizens.

Initial residency determinations are made at the point of admission to UAB. This initial determination may be appealed in writing by the student to the appropriate residency officer by the posted deadline. Decisions made by the residency officer may be appealed in writing by the student to the University Registrar who may, at his or her discretion, convene a review committee composed of appropriate UAB officials. Students may appeal the Registrar's decision to the Vice Provost for Administration and Quality Improvement.

Equal Opportunity and Discriminatory Harassment Policy

November 8, 2011

Policy Statement

The University of Alabama at Birmingham (UAB) hereby reaffirms its policy of equal opportunity in education and employment.

Equal Employment Opportunity

The University of Alabama at Birmingham is expressly committed to maintaining and promoting nondiscrimination in all aspects of recruitment and employment of individuals at all levels throughout UAB. In accordance with applicable law, UAB prohibits, and will not tolerate, discrimination in any personnel actions, UAB programs, and UAB facilities on the basis of race, color, religion, sex, national origin, disability unrelated to job performance, veteran status, or genetic or family medical history. In addition, UAB prohibits, and will not tolerate, discrimination against individuals on the basis of their sexual orientation, gender identity or gender expression. UAB also complies with the Age Discrimination in Employment Act which prohibits employment discrimination against persons 40 years of age or older. UAB will not tolerate any conduct by an administrator, supervisor, faculty, or staff member which constitutes any form of prohibited discrimination. All personnel actions, programs, and facilities are administered in accordance with UAB's equal opportunity commitment and affirmative action plan.

UAB will state its position as an equal opportunity/affirmative action employer in all solicitations and advertisements for employment vacancies placed by, or on behalf of, UAB. UAB will broadly publish and circulate its policy of equal employment opportunity by including a statement in all media communication and printed matter for employment purposes. Further, UAB will consider, through appropriate established procedures, complaints of any individual who has reason to believe that he or she has been affected by prohibited discrimination. See also the "Complaints" section below.

Equal Education Opportunity

As an institution of higher education and in the spirit of its policies of equal employment opportunity, UAB hereby reaffirms its policy of equal educational opportunity. UAB prohibits, and will not tolerate, discrimination in admission,

educational programs, and other student matters on the basis of race, color, religion, sex, sexual orientation, gender identity, gender expression, age, national origin, disability unrelated to program performance, veteran status, or genetic or family medical history. Complaints by any applicant or student who has reason to think he or she has been affected by discrimination will be considered through appropriate established procedures. See also the "Complaints" section below.

This policy must be included in all student handbooks and catalogs. The following summary statement may be printed in other UAB publications:

The University of Alabama at Birmingham prohibits discrimination in admission, educational programs, and other student matters on the basis of race, color, religion, sex, sexual orientation, gender identity, gender expression, age, national origin, disability unrelated to program performance, veteran status or genetic or family medical history.

Discriminatory Harassment Policy

In keeping with its commitment to maintaining an environment that is free of unlawful discrimination and in keeping with its legal obligations, UAB prohibits unlawful harassment (and discouraging conduct that, while not unlawful, could reasonably be considered unwelcome).

Discriminatory harassment of any kind is not appropriate at UAB, whether it is sexual harassment or harassment on the basis of race, color, religion, sex, sexual orientation, gender identity, gender expression, age, national origin, disability unrelated to program performance, veteran status, genetic or family medical history, or any factor that is a prohibited consideration under applicable law. At the same time, UAB recognizes the centrality of academic freedom and its determination to protect the full and frank discussion of ideas. Thus, discriminatory harassment does not refer to the use of materials about or discussion of race, color, religion, sex, sexual orientation, gender identity, gender expression, age, national origin, disability unrelated to program performance, veteran status, or genetic or family medical history for scholarly purposes appropriate to the academic context, such as class discussions, academic conferences, or meetings.

A. Definitions and Description of Prohibited Conduct.

1. Sexual Harassment

Harassment on the basis of sex is a violation of Section 703 of Title VII of the Civil Rights Act of 1964 and Title IX of the Education Amendments of 1972. *Unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute sexual harassment when:*

- *Submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment* (or a student's status)
- *Submission to or rejection of such conduct by an individual is used as the basis for employment decisions* (or academic decisions) *affecting such individual or*
- *Such conduct has the purpose or effect of unreasonably interfering with an individual's work performance* (or a student's academic performance) *or creating an intimidating, hostile, or offensive work* (or academic) *environment.*

Under the law, sexual harassment does not refer to occasional compliments or conduct of a socially acceptable nature. Nor does it refer to the use of materials or discussion related to sex and/or gender for scholarly purposes appropriate to the academic context. It does refer to non-academic remarks or actions of a sexual nature that are not welcome and are likely to be viewed as personally offensive. This can include but is not limited to any of the following activities that are unwelcome by the recipient: physical or verbal advances; sexual flirtations; propositions; verbal abuse of a sexual nature; vulgar talk or jokes; degrading graphic materials or verbal comments of a sexual nature about an individual or his or her appearance; the display of sexually suggestive objects outside a scholarly context and purpose; and physical contact of a sexual or particularly personal nature. Cartoons, pictures, or other graphic materials that create a hostile or offensive working environment may also be considered as harassment. In addition, no one should imply or threaten that an employee's, applicant's, or student's "cooperation" with unwelcome sexual advances or requests for sexual favors (or refusal thereof) will have any effect on the individual's employment, assignment, compensation, advancement, career development, grades, or any other condition of employment or status as a student.

2. Discriminatory Harassment of a Non-Sexual Nature

The same principles related to sexual harassment also apply to harassment on the basis of any characteristic that is protected by law. Thus, UAB's policy prohibits discriminatory harassment of a non-sexual nature, which includes *verbal, physical, or graphic conduct that denigrates or shows hostility or aversion toward an individual or group on the basis of race, color, religion, sex, national origin, disability unrelated to job performance, veteran status, genetic or family medical history,* or other status protected by applicable law and that

- *Has the purpose or effect of creating an intimidating, hostile, or offensive employment, educational, or living environment; or*

- *Has the purpose or effect of unreasonably interfering with an individual's work performance or a student's academic performance.*

UAB also adopts these principles with regard to discrimination or discriminatory harassment on the basis of sexual orientation, gender identity and gender expression.

Prohibited behavior may, for example, include conduct or material (physical, oral, written, or graphic, including e-mail messages, text messaging or use of social media posted or circulated in the community) involving epithets, slurs, negative stereotyping, or threatening, intimidating, or hostile acts, that serves no scholarly purpose appropriate to the academic context and gratuitously denigrates or shows hostility or aversion toward an individual or group because of race, color, religion, sex, sexual orientation, gender identity, gender expression, age, national origin, disability unrelated to program performance, veteran status, genetic or family medical history, or any factor protected by applicable law.

3. Applicability of Policy

In determining whether the conduct at issue is sufficient to constitute discriminatory harassment in violation of this policy, the conduct will be analyzed from the objective standpoint of a "reasonable person" under similar circumstances. No violation of the policy should be found if the challenged conduct would not create a hostile environment (i.e., substantially affect the work environment of a "reasonable person.") See EEOC Policy Guidance on Current Issues of Sexual Harassment at www.eeoc.gov.

All harassing conduct prohibited by this policy, whether committed by faculty, staff, administrators, or students, is strictly prohibited and will bring prompt and appropriate disciplinary action, including possible termination of employment or permanent exclusion from UAB. This policy shall apply to any UAB-sponsored event or program, whether on or off campus, or other situations in which an individual is acting as a member of the UAB community.

The level of discipline imposed will depend upon the severity and pervasiveness of the conduct, which may be determined by the existence of prior incidents of harassment or discrimination. Depending upon the severity of the offense, however, a single violation of this policy may be sufficient for termination of employment or expulsion from an academic program.

B. Prohibition Against Retaliation.

Retaliation against an individual who, in good faith, complains about or participates in an investigation of an allegation of discrimination or harassment is prohibited. Any individual who feels he or she has been retaliated against, or has been threatened with retaliation, should report that allegation immediately to the Office of the Vice President for Equity and Diversity or to the Office of the Chief Human Resources Officer.

C. False Accusations.

Anyone who knowingly makes a false accusation of discrimination, harassment, or retaliation will be subject to appropriate sanctions. However, failure to prove a claim of discrimination, harassment, or retaliation does not, in and of itself, constitute proof of a knowing false accusation.

Complaints

For purposes of this policy, a "complaint" is a formal notification (usually in writing) of the belief that prohibited discrimination has occurred. Prior to filing a formal complaint, an individual is strongly encouraged to resolve a discrimination allegation through an informal process.

UAB Staff, Faculty, and Students: The procedure for resolving allegations when both the individual making the complaint and the person against whom the complaint is made are employed or enrolled at UAB is described in the sections entitled "Informal Resolution Procedure" and "Submitting a Formal Complaint."

All Others: Situations that involve other individuals (for example, visitors, patients, alumni or former students, applicants for admission or employment, or former employees) who believe they have been discriminated against by someone either employed by, or enrolled at, UAB are to be addressed through the process entitled "Informal Resolution Procedure".

Informal Resolution Procedure

(NOTE: Procedures similar to the following informal process are also included in UAB's "Problem Resolution Procedure for Nonfaculty Employees" and in the UAB Faculty Handbook and Policies.)

Although none of the actions set forth below is required before an individual is eligible to file a formal complaint, UAB encourages use of these mechanisms for informal resolution of the complaint. This list is not exhaustive. Actions taken using any of these mechanisms do not necessarily constitute a finding of discrimination.

1. **One-on-one Meeting.** The person making the complaint is encouraged to meet with the person whose behavior is considered discriminatory to discuss the situation and to seek resolution.
2. **Intervention by Supervisor, Manager, or Department/Unit Head.** The person making the complaint is encouraged to contact his/her supervisor to request assistance with resolving the allegation of discrimination.
3. **Facilitated Conversation.** If one-on-one meetings or intervention by departmental officials as indicated above do not resolve the discrimination allegation, the individual making the complaint may

contact the appropriate office to request the assistance of a "facilitator." Facilitated conversations allow the parties involved to discuss the relevant issues in order to seek mutually agreeable solutions.

Individuals may contact the following for assistance with any aspect of the Informal Resolution Procedure:

Employees may contact their assigned HR Consultant or Employee Relations.

Faculty employees may contact the Office of the Provost or Employee Relations.

Students may contact the Office of the Vice Provost for Student and Faculty Success.

Disability Support Services is available for consultation in any instances involving disabilities.

The Office of the Vice President for Equity and Diversity is also available for consultation.

Should the above mechanisms fail to resolve the matter satisfactorily, a complaint may be filed by *Staff, Faculty and Students* through the formal complaint process.

Potential Disciplinary Action

A violation of this policy may result in disciplinary action up to and including discharge.

Submitting a Formal Complaint

Before filing a formal complaint of alleged discrimination, the relevant parties are encouraged to use one or more of the options outlined above for informal resolution of the allegation. If one chooses to proceed with a complaint, the complaint may be submitted in writing to one of the following, as appropriate:

Staff and Faculty
HR Consultant/Employee Relations
Office of the Chief Human Resources Officer
Office of the Provost
Office of the Vice President for Equity and Diversity

Students
Non-academic Conduct Officer
Disability Support Services (for disability discrimination)
Office of the Vice Provost for Student and Faculty Success

To the extent possible, all complaints will be handled confidentially and addressed in accordance with UAB policy. The complaints will be referred to the appropriate area for review and investigations will be conducted in a timely manner. In instances where staff, faculty and student issues overlap, the areas listed above will confer and/or work collaboratively to resolve the issue.

All individuals may use the procedures without penalty or fear of retaliation.

Also, any inquiries or complaints concerning the application of the Americans with Disabilities Act (ADA); Title VII of the Civil Rights Act of 1964; Executive Order 11246, as amended; Title IX of the Education Amendments of 1972; the Rehabilitation Act of 1973; or other legislation and its implementing regulations as they relate to the University of Alabama at Birmingham should be directed to one of the officials listed above.

Overall Implementation

The Office of the Vice President for Financial Affairs and Administration and the Office of the Provost are responsible for submitting revisions to be considered for this policy.

Drug-Free Campus Policy for Students

December 14, 1991

NOTE: See also the following related policies: Drug-free Workplace Policy; Drug Screening Policy for Student Athletes; and the "Policy on Impairment and Chemical Substance Abuse" as published by the School of Medicine, School of Dentistry, and School of Nursing.

Policy Statement

This policy is applicable to all students enrolled in credit course(s) or degree-granting programs at the University of Alabama at Birmingham (UAB) and to all students receiving academic credit at UAB (other than for continuing education units) for study in a program in a foreign country conducted by UAB alone or in conjunction with a foreign university.

Unlawful possession, use, manufacture, distribution, or dispensing of illicit drugs, controlled substances, or alcoholic beverages by any UAB student on UAB property or as part of any UAB-sponsored or UAB-sanctioned activity is prohibited. The legal possession, use, or distribution of alcoholic beverages on UAB property or at UAB-sponsored or UAB-sanctioned activities is governed by the UAB *General Policy Regarding the Use and Consumption of Alcoholic Beverages* and applicable local, state, and federal laws.

In certain situations, the university is required to report the activities prohibited by this policy to appropriate law enforcement authorities. In all cases, the University may report activities prohibited by this policy to appropriate law enforcement authorities if it appears that the activity is a violation of law.

Disciplinary Actions

Violations of this policy constitute nonacademic misconduct and will be subject to established disciplinary action for nonacademic misconduct in accordance with stipulations in the *Direction Student Handbook* or other applicable procedures. Violations of this policy by students should be reported to the appropriate student affairs office or other office handling student nonacademic misconduct in the same manner in which other instances of nonacademic misconduct are reported.

In some cases of violation of this policy for unlawful use, a student may be given, at the discretion of the University, the option to participate satisfactorily in an approved drug or alcohol abuse assistance or rehabilitation program in lieu of dismissal. Participation in such an assistance or rehabilitation program is at the expense of the student.

Drug-free Awareness Program

At least annually, UAB shall inform students of the dangers of drug and alcohol abuse on campus, of the existence of this policy statement and its penalties for violations, and of available drug and alcohol counseling, rehabilitation, and assistance through the following activities:

1. publication, at least annually, of this policy in appropriate student publications and distribution to students in UAB's foreign programs and to students in programs conducted in conjunction with foreign universities;

2. inclusion of this policy in future editions of student class schedules and/or registration materials, student handbooks, and student catalogs;

3. dissemination of this policy and of information at student orientation and assistance programs regarding the dangers of drug and alcohol use and abuse and available rehabilitation programs; and

4. continuation, and expansion, of the UAB drug and alcohol awareness program which includes sponsorship of the "Alcohol/Drug Awareness Week" and publication of pamphlets and other materials.

Applicability to Other Policies

Other drug-free policies created to cover specific areas of the university may be more restrictive than this policy but may not be less restrictive. At a minimum, other such policies must include, or reference, the provisions of this policy. Violators will be subject to the provisions of the more stringent policy but will not be punished under more than one policy for the same offense.

This policy does not revoke or otherwise interfere with policies in the health professional schools designed to determine whether health care professionals are impaired and to offer rehabilitation, subject to the above provisions.

The wording in the "Non-academic Conduct" section of the *Direction Student Handbook* which relates to causes of dismissal due to the use, possession, etc. of illicit drugs, controlled substances, or alcoholic beverages references only certain provisions of this more extensive policy. The entire policy is applicable in all cases even if the policy itself is not printed in full.

Attachments

The "Applicable Legal Sanctions," "Drug and Alcohol Use Health Risks," and "Drug and Alcohol Counseling, Treatment, and Rehabilitation Programs" attached to this policy are a part of the policy but may be revised from time to time without affecting the policy itself.

Effective Date and Implementation

This policy is effective immediately upon its being signed by the President.

The offices of the appropriate Vice Presidents are responsible for the development and maintenance of procedures to implement this policy within their areas of responsibility.

In addition to being distributed to students on the UAB campus, this policy will be distributed to students in UAB's foreign programs and to students in programs conducted in conjunction with foreign universities. The Vice President for Student Affairs is responsible for all distributions to students covered by this policy.

Attachment A
"Applicable Legal Sanctions"

Federal Penalties and Sanctions for Illegal Possession of a Controlled Substance
(55 Federal Register 33589)

21 U.S.C. 844(a)
First conviction: Up to 1 year imprisonment and fined at least $1,000 but not more than $100,000, or both.

After 1 prior drug conviction: At least 15 days in prison, not to exceed 2 years and fined at least $2,500 but not more than $250,000, or both.

After 2 or more prior drug convictions: At least 90 days in prison, not to exceed 3 years and fined at least $5,000 but not more than $250,000, or both.

Special sentencing provisions for possession of crack cocaine: Mandatory at least 5 years in prison, not to exceed 20 years and fined up to $250,000, or both, if:

(a) First conviction and the amount of crack possessed exceeds 5 grams.

(b) Second crack conviction and the amount of crack possessed exceeds 3 grams.

(c) Third or subsequent crack conviction and the amount of crack possessed exceeds 1 gram.

21 U.S.C. 853(a)(2) and 881(a)(7)

Forfeiture of personal and real property used to possess or to facilitate possession of a controlled substance if that offense is punishable by more than 1 year imprisonment. (See special sentencing provisions re: crack.)

21 U.S.C. 881(a)(4)
Forfeiture of vehicles, boats, aircraft, or any other conveyance used to transport or conceal a controlled substance.

21 U.S.C. 844a
Civil fine of up to $10,000 (pending adoption of final regulations).

21 U.S.C. 853a
Denial of Federal benefits, such as student loans, grants, contracts, and professional and commercial licenses, up to 1 year for first offense, up to 5 years for second and subsequent offenses.

18 U.S.C. 922(g)
Ineligible to receive or purchase a firearm.

Miscellaneous

Revocation of certain Federal licenses and benefits, e.g., pilot licenses, public housing tenancy, etc., are vested within the authorities of individual Federal agencies.

Note: See Attachment A.1 for additional Federal drug trafficking penalties and information.

Note: These are only Federal penalties and sanctions. Additional *State* penalties and sanctions may apply.

Summary of State Penalties and Sanctions

Under Alabama law, the possession, purchase, or consumption of alcoholic beverages by a person under 21 years of age is punishable by a fine of up to $500 and by up to three months in jail. Also under Alabama law, for a first offense, unlawful possession of a controlled substance (that is, illegal drugs) may be punished by imprisonment up to 10 years and a $5,000 fine and unlawful distribution of controlled substances may be punished by imprisonment up to 20 years and a $10,000 fine. Subsequent offenses may carry more stringent sentences.

Drug-Free Schools and Communities Act

Illegal drug and alcohol use, consumption, distribution, etc. on college and university campuses also are covered by the provisions of the United States Drug-Free Schools and Communities Act Amendment of 1989 (Public Law 101-226).

Legal Sanctions in Foreign Countries

Students in a program in a foreign country conducted by UAB or in conjunction with a foreign university also may be subject to sanctions under foreign law or under the Uniform Code of Military Justice. Although the legal sanctions described in this policy under United States law may not apply to students in a foreign country, UAB will nevertheless hold such students to the same standards as students within the United States and will take the disciplinary actions described in this policy for violations of these standards.

Attachment B
"Drug and Alcohol Use Health Risks"

General

Although there has been recent change in American health habits and societal attitudes toward recreational drug and alcohol use, problems continue to exist and experimentation is starting at an earlier age. An important piece of information to surface in recent years is that even moderate, nonprescribed use of alcohol and nonprescribed use of drugs can have an adverse effect on overall health and well-being. Consider the following facts:

1. Drinking more than one or two alcoholic beverages a week promotes more visible signs of aging.
2. Consuming one and one-half or more alcoholic beverages per day increases the risk of breast cancer.
3. Drinking alcoholic beverages poisons the heart muscle, counteracts the benefits of exercise, increases male impotence, and depresses the body's immune system.
4. Tobacco use is a contributing factor in the development of chronic bronchitis, emphysema, circulatory problems, and coronary disease, as well as being the leading cause of lung cancer.
5. Cocaine use is responsible for kidney damage, stroke, lung and heart diseases, seizures, and intense psychological problems.
6. Many forms of narcotics are highly addictive to users.
7. Marijuana use creates certain dysfunction related to thinking, learning, and recall; aggravates asthma, bronchitis, and emphysema; contributes to fertility problems, and contributes to the development of lung cancer.
8. The nonprescribed use of tranquilizers, barbiturates, and amphetamines is dangerous and may cause major health problems, including death.
9. Extended drug and/or alcohol use may result in substance dependency and loss of control of an individual's life.

Source

Drug data compiled by UAB Substance Abuse Program from the following resources:

Drug Data: What Everyone Needs to Know about Mood-altering Drugs, Comp Care Publications, Minneapolis.

You Are What You Drink, Allan Luks and Joseph

Barbato, Villard Books, New York.
You Can Stop, Jacquelyn Rogers, Simon & Schuster, New York.

Attachment B.1
Alcohol—Effects (55 Federal Register 33591)

Alcohol consumption causes a number of marked changes in behavior. Even low doses significantly impair the judgment and coordination required to drive a care safely, increasing the likelihood that the driver will be involved in an accident. Low to moderate doses of alcohol also increase the incidence of a variety of aggressive acts, including spouse and child abuse. Moderate to high doses of alcohol cause marked impairments in higher mental functions, severely altering a person's ability to learn and remember information. Very high doses cause respiratory depression and death. If combined with other depressants of the central nervous system, much lower doses of alcohol will produce the effects just described.

Repeated use of alcohol can lead to dependence. Sudden cessation of alcohol intake is likely to produce withdrawal symptoms, including severe anxiety, tremors, hallucinations, and convulsions. Alcohol withdrawal can be life-threatening. Long-term consumption of large quantities of alcohol, particularly when combined with poor nutrition, can also lead to permanent damage to vital organs such as the brain and the liver.

Mothers who drink alcohol during pregnancy may give birth to infants with fetal alcohol syndrome. These infants have irreversible physical abnormalities and mental retardation. In addition, research indicates that children of alcoholic parents are at greater risk than other youngsters of becoming alcoholics.

Attachment B.2
Uses and Effects of Controlled Substances
See Attachment B.2 for additional information concerning health risks involved in drug use.

Attachment C
"Drug and Alcohol Counseling, Treatment, and Rehabilitation Programs"

Student Services

The Campus Assistance Program is designed to address the following issues: continued longitudinal needs assessments, campus community awareness, enlistment of support from all campus segments, identification of high-risk students, early intervention, development of peer counseling and support groups, and referral to on/off campus resources and treatment facilities when indicated. The following are on-campus programs available to students:

Campus Assistance Program
Counseling and Wellness Center
924 19th Street South
Birmingham, AL 35294-2100
934-5816

UAB Mental Health Services
Center for Psychiatric Medicine
1713 Sixth Avenue, South
Birmingham, Alabama 35294-0018
ACCESS line 934-7008

UAB Substance Abuse Program
401 Beacon Parkway West
Birmingham, Alabama 35209
917-3733

Other non-UAB, off-campus services are available in the Birmingham area and in many of the foreign countries in which UAB conducts programs of study. Such counseling, treatment, and rehabilitation services are too numerous to list here, but anyone needing assistance with locating such off-campus or foreign country services may contact one of the programs listed above or the UAB Center for International Programs, as appropriate.

Immunization Policy

December 7, 2011

Introduction

To provide a safe and healthy environment for all students, faculty, and staff at the University of Alabama at Birmingham (UAB), and in accordance with the recommendations of the Alabama Department of Public Health (ADPH) and American College Health Association (ACHA), UAB requires immunizations as set forth in this policy.

First-time Entering UAB Students

All first-time entering students who enroll at UAB must show proof of specified immunizations as outlined by the UAB Student Health Service on their website: (http://www.uab.edu/studentimmunizations). Enrolling students must show proof of the required immunizations with either an official certificate of immunization, a photocopy of an immunization certificate, or written documentation from their physician.

International Students and International Scholars

Because of the disparity of immunization requirements among many foreign countries, all UAB international students and international scholars are required to be immunized as outlined by the UAB Student Health Service on their website (http://www.uab.edu/studentimmunizations). In lieu of being re-immunized, such individuals may present proof of having had the required immunizations. If

they do not have such proof or have not been immunized, they must be immunized against the specified diseases prior to attending, enrolling, or participating in UAB academic, research, observing, or clinical programs and activities.

Furthermore, all international students and international scholars must show proof of a non-reactive Tuberculin skin test or negative blood test or appropriate treatment if positive within three months prior to enrollment or visiting. Details of this requirement are provided by the UAB Student Health Service on their website (http://www.uab.edu/studentimmunizations).

Students Enrolled in Health-related Schools

Because of the nature of their work, students engaged in health professional training programs could have a higher risk of contracting certain diseases. Therefore, all UAB students in the Joint Health Sciences programs and in the Schools of Medicine, Dentistry, Optometry, Public Health, Nursing, and Health Professions are required to be immunized as outlined by the UAB Student Health Service on their website (http://www.uab.edu/studentimmunizations). In lieu of being re-immunized, such individuals may present proof of having had the required immunizations. Proof must be either official medical documentation or certificates of immunization or positive titer. If students do not have such proof or have not been immunized, they must begin the immunization process against these diseases prior to being admitted, attending, enrolling, or participating in UAB academic, research, or clinical programs and activities.

All students enrolled in health-related schools must have had a Tuberculin skin test with negative results or negative blood test or appropriate treatment if positive within three months prior to matriculation. Students participating in clinical environments with patients will be required to obtain a two-step Tuberculin skin test or blood test before starting clinical rotations and are mandated to renew their Tuberculin one-step skin test or blood test once per year. Details of this requirement are outlined by the UAB Student Health Service on their website (http://www.uab.edu/studentimmunizations).

Short-term Clinical and International Students

Students enrolled in clinical activities for three months or less and international students present at UAB for less than three months will be considered short-term. These students must be screened to rule out active tuberculosis. Screening requirements are outlined by the UAB Student Health Service on their website (http://www.uab.edu/studentimmunizations).

General

The UAB Student Health Service will provide such immunizations and titer testing on a fee-for-service basis for any student who needs to meet his or her UAB immunization or titer requirements. Students may choose to fulfill these requirements at the Jefferson County Health Department or with a private physician.

Exceptions

Exceptions to this policy will be made in limited circumstances for students who can document medical and/or other contraindications to the vaccine. Requests for exceptions must be submitted to UAB Student Health Service for consideration and approval.

Students enrolled in online programs listed at http://www.uab.edu/studentimmunizations are exempt from this policy.

Implementation

The Provost is responsible for procedures to implement this policy.

Health Care Policy for International Students and Scholars

May 1, 2000

Introduction

The purpose of this policy is to ensure that international students and scholars have appropriate health-care opportunities and health insurance coverage while they are enrolled as UAB students or are participating in UAB activities.

Students and Scholars Covered by this Policy

1. All UAB degree-seeking international students, regardless of course load, school, or degree program, must participate in the UAB Student Health Service and must have adequate health insurance coverage.

2. All transient and temporary international students must have adequate health insurance coverage. Those students may use the services of the UAB Student Health Service on a fee-for-service basis.

3. International scholars who participate in activities at UAB for longer than four weeks should be encouraged to participate in the UAB Student Health Service and must have adequate health insurance coverage. International scholars here for four weeks or less who do not participate in the UAB Student Health Service may use the services of Student Health on a fee-for-service basis. The inviting UAB department will be offered the opportunity to accept responsibility for the fee-for-service charges incurred. If the department does not wish to pay the fee-for-service bills, the international scholar will be responsible for the bills.

Definitions

For purposes of this policy, the following definitions apply:

"Transient international students" are defined as international students who are in the United States under the authorization of another institution organization but who are taking coursework at UAB.

"Temporary international students" are defined as international students who are taking less than a full-time course of study at UAB and who are not pursuing an official UAB degree or certificate.

"Adequate health insurance" is defined as follows:

a. Insurance provided through the UAB Student Health Service, *OR*

b. Equivalent personal health insurance, the evidence for which must be shown to, and verified by, the UAB Student Health Service.

Implementation

The Vice Provost for Administration and Quality Improvement is responsible for procedures to implement this policy.

Policy Concerning AIDS and HIV Infection

April 24, 1998

Definitions

The following are definitions or explanations of terminology used in this policy:

AIDS—Acquired immunodeficiency syndrome occurs in someone with HIV infection when one or more of certain disease or infections occurs or when a CD4 (also know as T4 helper) lymphocyte cell count is below 200.

HIV—Human immunodeficiency virus (the virus which causes AIDS).

HIV antibody—A protein in the body produced in response to infection with HIV. (There are tests which look for HIV antibody in a person infected with HIV.)

HIV infection—A condition involving asymptomatic (without symptoms) or symptomatic (with symptoms) stages of infection.

Introduction

Human immunodeficiency virus (HIV) is the virus which causes the disease, AIDS. Infection with that virus damages the human body's immune (defense) system and allows life-threatening infections to develop. HIV has no known cure or vaccine for prevention. Available medical knowledge indicates that transmission of HIV is primarily through sexual contact or sharing intravenous drug paraphernalia with someone who has an HIV infection. It also can be spread from an infected mother to her baby before, or during, delivery and through breast feeding. HIV cannot be transmitted through casual contact such as sharing food or drink, touching surfaces, shaking hands, dry kissing, or working together. HIV cannot be transmitted by mosquitoes or other insects.

Even if there are no symptoms, an HIV-infected person can transmit HIV to a sexual partner or needle-sharing partner.

Because of the seriousness of the HIV/AIDS issue, the University of Alabama at Birmingham has established this policy which focuses on prevention (through detailed education of students, faculty, and staff) and on the compassionate care of people with HIV infection or AIDS.

A supervisor or anyone in the UAB community who becomes aware of an HIV/AIDS related situation involving an employee, student, or visitor shall follow the guidelines stated in this policy.

Policy Statement

1. Admissions or Employment

The University of Alabama at Birmingham accepts otherwise-qualified individuals presenting themselves for admission or employment, irrespective of their HIV status.

2. Handicapping Conditions

Persons with AIDS (and, possibly, those with other manifestations of HIV infection) will be considered as having handicapping conditions as defined in the Rehabilitation Act of 1973 and the Americans with Disabilities Act. In determining policy and in making related decisions, UAB officials shall properly attend to the legal rights of these individuals and shall make reasonable accommodations as are appropriate for individuals with handicapping conditions.

Decisions regarding the continuation of employment of faculty and staff with HIV infection or AIDS will be made on the basis of job-related criteria. Within current UAB policies and procedures, individuals may be reassigned to accommodate a disabling condition. Termination will be pursued only when the employee, even with reasonable reassignment of responsibilities, can no longer perform the duties and responsibilities of his or her position. Any such termination action will be taken in accordance with established UAB procedures.

3. Student Attendance

UAB students who have HIV infections, whether they are symptomatic or asymptomatic, will be allowed regular classroom attendance as long as they are physically and mentally able to attend classes as determined by current UAB academic standards.

HIV-infected students enrolled in UAB health profession schools may have their educational program modified by their school to limit the risk of disease transmission, in accordance with the Alabama

Infected Health-care Worker Management Act.

4. Access to Facilities

There will be no unreasonable restriction of access on the basis of HIV infection to student or employee facilities, theaters, restaurants, snack bars, gymnasiums, swimming pools, saunas, recreational facilities, or other common areas.

5. Student Housing

Currently available medical information does not indicate that there exists a risk of transmission of infection by casual contact which would preclude sharing a residence with a person with AIDS or HIV infection. However, there may be reasonable concern for the health of students with immune deficiencies (of any origin) when those students might be exposed to certain contagious diseases (for example, measles or chicken pox) in a close living situation. For these reasons, decisions regarding housing and private rooms for students with HIV infections will be made on a case-by-case basis by UAB Student Housing and Residential Life officials. It is the responsibility of the student to make his or her HIV status known to UAB in order for any accommodation request to be considered. It also is the responsibility of an HIV-infected student to take necessary precautions to avoid exposure of others to infection through known means of transmission.

6. Self-disclosure

In general, students, student applicants, employees, and applicants for employment at UAB will not be asked to respond to questions concerning the existence of HIV infection. However, both students and employees with HIV infection are encouraged to inform campus health-care providers so that UAB may provide information about proper medical care, medical care availability, support, counseling, and education. This, like any other medical information, will be handled in a strictly confidential manner in accordance with established UAB policy and Alabama law.

7. Immunizations

Incoming students known to have HIV infection need not be exempted from UAB requirements for non-live virus vaccinations. However, because of potentially serious consequences for HIV-infected persons' receiving live virus vaccines, persons who are recommended to receive such immunizations should consult the UAB Student Health Center or the Jefferson County Department of Health for current recommendations.

8. Information, Testing, and Counseling

A. Testing. Students or employees requesting HIV antibody testing will be referred to the Jefferson County Department of Health. UAB University Hospital employees also may receive such testing through the Employee Health Services.

B. Services. Counseling, information, and education are available through various UAB units including the Student Health Service, the Division of Student Affairs, the Hospital Employee Health Service, and the Office of Human Resource Management. These services currently are made available to the students or employees at no cost and in accordance with the guidelines in each unit.

9. Confidentiality of Information

A. Standards. No information concerning HIV infection or AIDS or their diagnoses will be provided to any third party other than an employee's immediate supervisor without the expressed written consent of the infected person. Medical information cannot be released to any person, group, agency, insurer, employer, or institution without specific written consent of the patient or legal guardian, except as required by law. All disclosures of diagnoses of HIV infection or AIDS to individuals functioning in supervisory roles must be treated as confidential information.

According to present law, UAB physicians and other health-care providers are mandated to protect the confidentiality of medical information with exceptions being made only if the need arises to protect others in very specific, life-threatening circumstances. Also, disclosure by persons other than health-care providers that an individual has HIV infection or AIDS may be considered an invasion of that individual's privacy. Situations in which disclosure will be made will be determined on a case-by-case basis in consultation with the chair of the AIDS Activities Coordinating Committee and the Office of Counsel, if needed.

B. Public Health Reporting Requirements. UAB will observe the public health reporting requirements of the Alabama State Department of Public Health. Individuals known to have HIV infection will be reported to the State Department of Public Health according to prevailing statutes.

C. "Need to Know." According to the American College Health Association, current medical information concerning HIV neither justifies nor requires warning others of the presence of someone with HIV infection or AIDS. Given the absence of any evidence of transmission of HIV by casual contact, there is no need or justification for warning individuals in the academic workplace, administrative officers, or instructors of the presence of such an individual. Therefore, the number of people at UAB who will be aware of the existence and/or identity of students or employees who have HIV infection will be kept to an absolute minimum, both to protect the confidentiality and the privacy of the infected persons and to avoid the generation of unnecessary fear and anxiety among faculty, staff, and students.

10. Education

Training requirements for employees deemed at-risk by the AIDS Activities Coordinating Committee shall consist of sessions sufficient in number and depth to comply with prevailing Centers for Disease Control and Prevention recommendations and "Bloodborne Pathogens Standards." In the absence of such guidelines, the AIDS Activities Coordinating Committee shall determine educational standards. Records of AIDS education training for at-risk employees shall be maintained in the appropriate UAB Human Resource Management Office.

11. Safety Precautions

A. Personnel. Since many people with HIV infection are not identified in advance, universal precautions as defined by the Centers for Disease Control and Prevention and by the Occupational Safety and Health Administration will guide the procedures for the handling of blood and body fluids containing viable blood of any student, employee, or patient. Questions regarding these safety guidelines should be directed to the Department of Occupational Health and Safety, the Hospital Employee Health Service, the Office of Human Resource management, the Hospital Committee on Infections, or the UAB Biosafety Committee. Each unit has the responsibility for developing department-specific directives and procedures. Departments also have the responsibility for compliance monitoring and staff education to prevent the transmission of HIV infection.

B. Equipment. Manuals and procedures already in use at UAB cover the precautions which should be taken when handling infectious materials. Certain of those procedures are re-emphasized here especially as pertains to the transmission of HIV infection.

UAB personnel will use disposable, single-use needles and other equipment whenever such equipment will puncture the skin or mucous membranes of patients, employees, or students. Extreme caution should be exercised when handling sharp objects, particularly in disposing of needles. All used needles should be placed in puncture-resistant containers designated for this purpose. Needles should never be bent or recapped after use. Any needles which are made to be re-used or other equipment that punctures skin or mucous membranes should be appropriately cleaned and sterilized before re-use. Blood-soaked articles should be placed in leak-proof bags with biohazard labels before being sent for reprocessing or disposal in accordance with establish UAB infection control guidelines.

C. Teaching Laboratories. Laboratory courses require exposure to blood, such as biology courses in which blood is obtained by finger prick for typing or examination, should use disposable equipment, and no lancets or other blood-letting devises should be re-used or shared, No students, except those in health-care professions, should be required to obtain or process the blood of others.

12. Job Performance

Faculty, staff, students, and all other persons affiliated with UAB shall perform the responsibilities of their positions irrespective of the HIV status of patients, students, or co-workers. Failure to comply with this policy will be considered a failure to adequately perform the responsibilities of one's position and may result in disciplinary action up to, and including, discharge.

13. Behavior Risk

UAB students, faculty, and staff with HIV infection or AIDS who are aware of the potential danger of their condition to others and who engage in behavior (while performing their employee-related or student-related activities) which threatens the safety and welfare of others may be subject to disciplinary action in accordance with established UAB disciplinary procedures and/or applicable law.

Applicability to Other UAB AIDS Policies

More specific, written guidelines and procedures are the responsibility of individual departments and may be developed, as needed, by department/unit heads. All unit policies must be compatible with this UAB-wide policy and may not be in conflict with it.

Attachment A.1
(55 Federal Register33588)

Federal Trafficking Penalties

As of November 18, 1988

CSA	PENALTY 2nd Offense	PENALTY 1st Offense	Quantity	DRUG	Quantity	PENALTY 1st Offense	PENALTY 2nd Offense
I and II	Not less than 10 years. Not more than life. If death or serious injury, not less than life. Fine of not more than $4 million individual $10 million other than individual.	Not less than 5 years. Not more than 40 years. If death or serious injury, not less than 20 years. Not more than life. Fine of not more than $2 million individual $5 million other than individual.	10-99 gm or 100-999 gm mixture	METHAMPHETAMINE	100 gm or more or 1 kg[1] or more mixture	Not less than 10 years. Not more than life. If death or serious injury, not less than 20 years. Not more than life. Fine of not more than $4 million individual $10 million other than individual.	Not less than 20 years. Not more than life. If death or serious injury, not less than life. Fine of not more than $8 million individual $20 million other than individual.
			100-999 gm mixture	HEROIN	1 kg or more mixture		
			500-4,999 gm mixture	COCAINE	5 kg or more mixture		
			5-49 gm mixture	COCAINE BASE	50 gm or more mixture		
			10-99 gm or 100-999 gm mixture	PCP	100 gm or more or 1 kg or more mixture		
			1-10 gm mixture	LSD	10 gm or more mixture		
			40-399 gm mixture	FENTANYL	400 gm or more mixture		
			10-99 gm mixture	FENTANYL ANALOGUE	100 gm or more mixture		

	Drug	Quantity	First Offense	Second Offense
	Others[2]	Any	Not more than 20 years. If death or serious injury, not less than 20 years, not more than life. Fine $1 million individual, $5 million not individual.	Not more than 30 years. If death or serious injury, life. Fin $2 million individual, $10 million not individual.
III	All	Any	Not mroe than 5 years. Fine not more than $250,000 individual, $1 million not individual.	Not more than 10 years. Fine not more than $500,000 individual, $2 million not individual.
IV	All	Any	Not more than 3 years. Fine not more than $250,000 individual, $1 million not individual.	Not more than 6 years. Fine not more than $500,000 individual, $2 million not individual.
V	All	Any	Not more than 1 year. Fine not more than $100,000 individual, $250,000 not individual.	Not more than 2 years. Fine not more than $200,000 individual, $500,000 not individual.

[1]Law as originally enacted states 100 gm. Congress requested to make technical correction to kg.

[2] Does not include marijuana, hashish, or hashish oil. (See separate chart.)

Federal Trafficking Penalties - Marijuana

As of November 18, 1988

Quantity	Description	First Offense	Second Offense
1, 000 kg or more; or 1,000 or more plants	Marijuana Mixture containing detectable quantity*	Not less than 10 years, not more than life. If death or serious injury, not less than 20 years, not more than life. Fine not more than $4 million on individual, $10 million other than individual.	Not less than 20 years, not more than life. If death or serious injury, not less than life. Fine not more than $8 million individual, $20 million other than individual.
100 kg to 1,000 kg; or 100-999 plants	Marijuana Mixture containing detectable quantity*	Not less than 5 years, not more than 40 years. If death or serious injury, not less than 20 years, not more than life. Fine not more than $2 million individual, $5 million other than individual.	Not less than 10 years, not more than life. If death or serious injury, not less than life. Fine not more than $4 million individual, $10 million other than individual.
50 to 100 kg	Marijuana	Not more than 20 years. If death or serious injury, not less than 20 years, not more than life. Fine $1 million individual $5 million other than individual.	Not more than 30 years. If death or serious injury, life. Fine $2 million individual, $10 million other than individual.
10 to 100 kg	Hashish		
1 to 100 kg	Hashish Oil		
50-99 plants	Marijuana		
Less than 50 kg	Marijuana	Not more than 5 years. Fine not more than $250,000, $1 million other than individual.	Not more than 10 years. Fine $500,000 individual, $2 million other than individual.
Less than 10 kg	Hashish		
Less than 1 kg	Hashish Oil		

*Includes Hashish and Hashish Oil.

(Marijuana is a Schedule I Controlled Substance.)

Attachment B.2

(55 Federal Register 33590)

Controlled Substances - *Uses & Effects*

DRUGS/ CSA SCHEDULES		TRADE OR OTHER NAMES	MEDICAL USES	DEPENDENCE Physical	DEPENDENCE Psychological	TOLERANCE	DURATION (hours)	USUAL METHODS OF ADMINISTRATION	POSSIBLE EFFECTS	EFFECTS OF OVERDOSE	WITHDRAWAL SYNDROME
NARCOTICS											
Opium	II III V	Dover's Powder, Paregoric, Parapectolin	Analgesic, antidiarrheal	High	High	Yes	3-6	Oral, smoked	Euphoria, drowsiness respiratory depression, constricted pupils, Nausea	Slow and shallow breathing, clammy skin, convulsions, coma, possible death	Watery eyes, runny nose, yawning, loss of appetite, irritability, tremors, panic, cramps, nausea, chills and sweating
Morphine	II III	Morphine, MS-Contin, Roxanol, Roxanol-SR	Analgesic, antitussive	High	High	Yes	3-6	Oral, smoked, injected			
Codeine	II III V	Tylenol w/Codeine, Empirin w/Codeine, Robitussin A-C, Fiorinal w/Codeine	Analgesic, antitussive	Moderate	Moderate	Yes	3-6	Oral, injected			
Heroin	I	Diacetylmorphine, Horse, Smack	None	High	High	Yes	3-6	Injected, sniffed, smoked			
Hydromorphone	II	Dilaudid	Analgesic	High	High	Yes	3-6	Oral, injected			
Meperidine (Pethidine)	II	Demerol, Mepergan	Analgesic	High	High	Yes	3-6	Oral, injected			
Methadone	II	Dolophine, Methadone, Methadose	Analgesic	High	High-Low	Yes	12-24	Oral, injected			
Other Narcotics	I II III IV V	Numorphan, Percodan, Percocet, Tylox, Tussionex, Fentanyl, Darvon, Lomotil, Talwin	Analgesic, antidiarrheal, antitussive	High-Low	High-Low	Yes	Variable	Oral, injected			
DEPRESSANTS											
Chloral Hydrates	IV	Noctec	Hypnotic	Moderate	Moderate	Yes	5-8	Oral	Slurred speech, disorientation, drunken behavior without odor of alcohol	Shallow respiration, clammy skin, dilated pupils, weak and rapid pulse, coma, possible death	Anxiety, insomnia, tremors, delirium, convulsions, possible death
Barbiturates	II III IV	Amytal, Butisol, Florinal, Lotusate, Nembutal, Seconal, Tuinal, Phenobarbital	Anesthetic, anticonvulsant, sedative, hypnotic, veterinary euthenasia agent	High-Modl	High-Mod.	Yes	1-16	Oral			
Benzodiazepines	IV	Alivan, Dalmane, Diazepam, Librium, Xanax, Serax, Valium, Tranxene, Verstran, Versed, Halcion, Paxipam, Restoril	Antianxiety, anticonvulsant, sedative, hypnotic	Low	Low	Yes	4-8	Oral			
Methaqualone	I	Quaalude	Sedative, hypnotic	High	High	Yes	4-8	Oral			
Glutethimide	III	Doriden	Sedative, hypnotic	High	Moderate	Yes	4-8	Oral			
Other Depressants	III IV	Equanil, Miltown, Noludar, Placidyl, Valmid	Antianxiety, sedative, hypnotic	Moderate	Moderate	Yes	4-8	Oral			
STIMULANTS											
Cocaine[1]	II	Coke, Flake, Snow, crack	Local anesthetic	Possible	High	Yes	1-2	Sniffed, smoked, injected	Increased alertness, excitation, euphoria, increased pulse rate & blood pressure, insomnia, loss of appetite	Agitation, increase in body temperature, hallucinations, convulsions, possible death	Apathy, long periods of sleep, irritability, depressions, disorientation
Amphetamines	II	Biphetamine, Delcobese, Desoxyn, Dexedrine, Obetrol	Attention deficit disorders, narcolepsy, weight control	Possible	High	Yes	2-4	Oral, injected			
Phenmetrazine	II	Preludin	Weight control	Possible	High	Yes	2-4	Oral, injected			
Methylphenidate	II	Ritalin	Attention deficit disorders, narcolepsy	Possible	Moderate	Yes	2-4	Oral, injected			
Other Stimulants	III IV	Adipex, Cylert, Didrex, Ionamin, Melfiat, Plegine, Sanorex, Tenuate, Tepanil, Prelu-2	Weight control	Possible	High	Yes	2-4	Oral, injected			
HALLUCINOGENS											
LSD	I	Acid, Microdot	None	None	Unknown	Yes	8-12	Oral	Illusions and hallucinations, poor perception of time and distance	Longer, more intense "trip" episodes, psychosis, possible death	Withdrawal syndrome not reported
Mescaline and Peyote	I	Mescl, Buttons, Cactus	None	None	Unknown	Yes	8-12	Oral			
Amphetamine Variants	I	2,5-DMA, PMA, STP, MDA, MDMA, TMA, DOM, DOB	None	Unknown	Unknown	Yes	Variable	Oral, injected			
Phencyclidine	II	PCP, Angel Dust, Hog	None	Unknown	High	Yes	Days	Smoked, oral, injected			
Phencyclidine Analogues	I	PCE, PCPy, TCP	None	Unknown	High	Yes	Days	Smoked, oral, injected			
Other Hallucinogens	I	Bufotenine, Ibogaine, DMT, DET, Psilocybin, Psilocyn	None	None	Unknown	Possible	Variable	Smoked, oral, injected, sniffed			
CANNABIS											
Marijuana	I	Pot, Acapulco Gold, Grass, Reefer, Sinsemilla, Thai Sticks	None	Unknown	Moderate	Yes	2-4	Smoked, oral	Euphoria, relaxed inhibitions, increased appetite, disorientated behavior	Fatigue, paranoia, possible psychosis	Insomnia, hyperactivity, and decreased appetite occationally reported
Tetrahydrocannabinol	I II	THC, Marinol	Cancer chemotherapy antinauseant	Unknown	Moderate	Yes	2-4	Smoked, oral			
Hashish	I	Hash	None	Unknown	Moderate	Yes	2-4	Smoked, oral			
Hashish Oil	I	Hash Oil	None	Unknown	Moderate	Yes	2-4	Smoked, oral			

1 Designated a narcotic under the CSA. ***2 Not designated a narcotic under the CSA.***

Graduation Deadline Dates, 2012 - 2013

These dates are subject to change. Check the UAB Class Schedule each semester for any changes to these dates. Also check with your department because some programs have earlier deadline dates for submission of the application for degree.

Plan I
Graduate School deadlines for students completing a thesis or dissertation.

Semester	Diploma Date	Deadline for application for degree	Last day for public defense of thesis or dissertation	Graduate School Format Acceptance Review
Fall 2012	December 15	September 5	November 2	No later than 10 business days following public defense
Spring 2013	May 11	January 25	April 5	No later than 10 business days following public defense
Summer 2013	August 10	June 7	July 12	No later than 10 business days following public defense

Plan II
Graduate School deadlines for students NOT completing a thesis or dissertation.

Semester	Diploma Date	Deadline for application for degree	Last day for receipt of final papers
Fall 2012	December 15	September 5	December 5
Spring 2013	May11	January 25	May 1
Summer 2013	August 10	June 7	July 31

PLEASE NOTE:
Failure to meet these deadlines will require the filing of a "**NEW**" Application for Degree Form (reorder) and registration in subsequent semesters. The Application for Degree form (approved at the department level and received in the Graduate School) should be filed prior to the beginning of the semester the student plans to graduate. **It is the student's responsibility to see that the above deadlines are met**. Students will not be cleared for graduation until all paperwork has been processed, all grades have been finalized, and all fees (e.g., binding and microfilm) have been paid. Fee payment receipts for binding, microfilming, and copyrighting must be turned into the Graduate School office. The above dates are subject to change. Check with the Graduate School, 511 Hill University Center, or call 934-0656 if you have any questions concerning graduation.

Tip Sheet for Students Involved in Research Involving Human or Animal Subjects

	IRB	*IACUC*	*OH&S*
Who can serve as Principal Investigator (PI)?	PI may be the student, however, the faculty mentor must be listed as Co-PI and is equally responsible for the conduct of the study.	PI must have faculty status. List faculty mentor as PI on animal protocol and list student's name in parentheses after title.	PI may be the student, however, the faculty mentor must be listed as Co-PI and is equally responsible for the conduct of the study.
How are students added to a protocol?	(1) Submit amendment/revision form noting addition of personnel to existing protocol, (2) submit new protocol including student's name as PI (3) add student's name to request for changes in Investigator's Progress Report (renewal form) if involvement coincides with renewal due date.	(1) Submit modification request form noting addition of personnel to existing protocol, (2) submit new protocol including student's name in personnel section, or (3) add student's name to renewal form if involvement coincides with renewal due date.	(1) Send email to Glenda P. Moon (Glenda@uab.edu) or Donna S. Williamson (dsw@uab.edu) and indicate protocol name and funding agency (provide OH&S project #) and list students to be added. (2) Amend Project Registration form to include additional student names. Make a note that the addition of students is the only amendment.
When is it a procedural vs personnel modification?	n/a	If the student proposes to conduct animal procedures that are not already part of an approved protocol under their mentor then the mentor must either submit an amendment or a new protocol.	n/a
Timeline for review and approval.	Amendment/Revisions are normally reviewed within a week – you may add RUSH to top of form with an explanation as to the nature of the RUSH request – some request may be returned in 2 – 3 working days.	Personnel modifications are reviewed within 1 -2 business days of receipt and can be approved when all required training documentation is on file. Procedural modifications and new protocols received by the 21st of the month (or next regular business day if 21st is holiday or weekend) are entered into the subsequent month for review. Voting for protocols called for Full Committee Review occurs on the last Wednesday of the assigned review month.	Personnel modifications are reviewed within 1 -2 business days of receipt. PI and added personnel will be notified if additional information is needed.
Required training.	Initial and continuing Human Subjects Training which as applicable. Available training options and instructions are available at http://main.uab.edu/show.asp?durki=56078. If students have completed training at another institution it may be submitted for review by the OIRB and may be accepted to meet UAB's training requirements. On-line training may be started before student arrives on campus.	Students must complete the following training items, accessible through BlazerNet: (1) Basic training in rules, regulations, ethics and (2) species-specific training. Items 1 and 2 are on-line training modules (ca. 3 hrs).	Depends on the nature of the research. In addition to IACUC and IRB requirements, the use of material of human origin requires annual bloodborne pathogen training.
Occupational Health Requirements		The requirements for the UAB Occupational Health Program must be met before final approval to work with animals is granted. All non UAB employees	The requirements for the UAB Occupational Health Program must be met before final approval to work with animals and certain

		must receive clearance from their personal physician indicating that the physician has reviewed the proposed work and the medical history of the individual, that the individual is current for all required immunizations, and has been cleared to conduct the work proposed on the UAB Employee Occupational Health Enrollment Form. The letter and the form must be submitted before the requirements are met and the student cleared. **Please note: this may take extra time.**	other work (i.e., work with material requiring immunizations) is granted. All non UAB employees must receive clearance from their personal physician indicating that the physician has reviewed the proposed work and the medical history of the individual, that the individual is current for all required immunizations, and has been cleared to conduct the work proposed on the UAB Employee Occupational Health Enrollment Form. The letter and the form must be submitted before the requirements are met and the student cleared. **Please note: this may take extra time.**
Student defined.	An individual enrolled in a UAB undergraduate or graduate program.	An individual enrolled in a UAB undergraduate or graduate program.	An individual enrolled in a UAB undergraduate or graduate program.
Non-UAB students.	An individual enrolled in an undergraduate or graduate program at another institution. Non-UAB students must complete training, however, training from their "home" institution may be accepted. Please call OIRB for clarification. Non-UAB students may need a "blazer ID" to access on-line training. Faculty mentors may contact Human Resources for more information about obtaining a blazer ID and appointment of the student.	An individual enrolled in an undergraduate or graduate program at another institution. Non-UAB students may complete training items 1 and 2 but are not eligible for enrollment in the UAB Occupational Health Program. They must submit documentation of an equivalent evaluation provided through their own personal physician. They may use the UAB form, which must be submitted with a physician clearance, as the basis for that evaluation.	An individual enrolled in an undergraduate or graduate program at another institution. Non-UAB students may complete UAB on-line training (call to register) but are not eligible for enrollment in the UAB Occupational Health Program. They must submit documentation of an equivalent evaluation provided through their own personal physician. They may use the UAB form, which must be submitted with a physician clearance, as the basis for that evaluation.
Sponsored Projects	If the student is the Prime Awardee of their own sponsored research project they must submit a new protocol specifically detailing the protocol which must be concordant with the funding application.	If the student is the Prime Awardee of their own sponsored research project (i.e., funds budgeted for direct support of animal purchases, per diems, supplies, etc.) they must submit a new protocol specifically detailing the animal procedures proposed in the corresponding grant, fellowship, contract, etc. If the student is the Prime Awardee of a grant, fellowship, contract, etc with funds solely for salary support they must submit the IACUC form to register the project as a salary support project. Note: faculty mentor should be listed as PI on the IACUC form.	If the student is the Prime Awardee of their own sponsored research project, and that project either involves material that is potentially hazardous or requires some sort of approval from OH&S, they must submit a new protocol specifically detailing the protocol which must be concordant with the funding application.
Forms and staff directory.	www.uab.edu/irb	www.uab.edu/iacuc	www.healthsafe.uab.edu

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