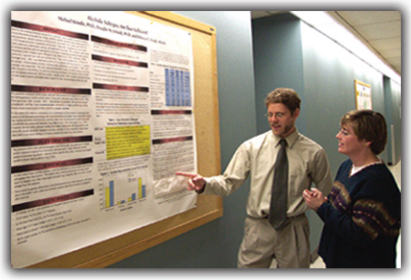
www.uab.edu/graduate












The University of Alabama at Birmingham

Graduate Catalog 2006-2008

General Information

UAB

The University of Alabama at Birmingham (UAB) is an urban university and medical center that encompasses 82 city blocks and has a student enrollment of more than 16,000. UAB is home to a large graduate school, a world-renowned health care complex and more than 100 different research centers focusing on such diverse issues as AIDS, business development, and biodefense and emerging infections.

The university is composed of 13 schools, as well as hospitals and clinics housing internationally renowned patient care programs. UAB includes the Schools of Arts and Humanities, Business, Dentistry, Education, Engineering, Health Professions, Medicine, Natural Sciences and Mathematics, Nursing, Optometry, Public Health, Social and Behavioral Sciences, and the Graduate School.

More than 4,300 graduate students are enrolled in UAB's 35 doctoral programs and 44 master's programs. Many of these programs unite different disciplines and cross departmental and school lines, illustrating the strong interdisciplinary character of the university.

UAB is one of the top research universities in the country. Today, UAB receives more than $415 million in research funding.

Accreditation

The University of Alabama at Birmingham is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award degrees at the bachelor's, master's, specialist, and doctoral levels. Individual schools and programs are also accredited by regional and national professional organizations.

Student Life

Campus life at UAB is characterized by the bustle and diversity of the university's urban setting. UAB graduate students take advantage of a wide variety of cultural and recreational opportunities on and off campus, and numerous student organizations and associations invite participation.

UAB's Hill University Center serves as a hub for campus life, providing under one roof a full-service cafeteria, a large bookstore, an auditorium, meeting rooms, lounges, and other recreational areas. The UAB Arena seats more than 8,000 for concerts, sports events, graduation exercises, and other special events.

The Alys Robinson Stephens Performing Arts Center houses a 1,400-seat concert hall and the 400-seat Theater. Both of these facilities have outstanding acoustics, technical capability, and comfort, and each hosts a wide variety of student and professional performances. The Alys Stephens Center also has a 175-seat recital hall, an experimental ("black box") theater, an arts computing facility, practice rooms, faculty offices, and other instructional space. The

center is home to the Alabama Symphony Orchestra and hosts a wide variety of cultural events throughout the year.

Ten musical performing groups (Blazer Band, Chamber Singers, Concert Choir, Gospel Choir, Jazz Ensemble, Marching Blazers, Computer Music Ensemble, Opera Workshop, Percussion Ensemble, and Wind Ensemble) provide enrichment and performing opportunities. A major campus theater offers several productions each year (free to students); there are several small performing groups on campus, as well as a UAB-affiliated community theater. Dance groups offer opportunities in ballet and jazz. Artwork is continuously exhibited in the Visual Arts Gallery and several other galleries on campus.

Student publications include a campus-wide newspaper, *The Kaleidoscope*, published weekly; a literary magazine, *Aura;* and an online nonfiction magazine, *Phoenix*.

University programs include a lecture series, an acclaimed film series (showing films several times a month, including popular, foreign, and classic films), a progressive and diverse concert series, and an assortment of special events, seminars, dances, and other activities. Many of these programs and activities are free to students with valid ID cards.

UAB's intercollegiate sports program includes baseball, football, rifle, softball, synchronized swimming, track, and volleyball, as well as men's and women's teams for basketball, golf, soccer, and tennis. Many of our teams have won conference championships.

The new 150,000-square-foot campus recreation center houses aquatics, court sports, an indoor track, weight and fitness areas, climbing wall and outdoor recreation, game room, and juice bar. Two softball fields, two football fields with goals for soccer; a baseball field and a number of tennis courts are nearby. An active intramural sports program attracts the participation of many graduate students.

UAB Study Abroad

Explore a world of opportunities in the Study Abroad Program. The experience of living and learning in another country will enrich your background and broaden your career horizons. The UAB program offers courses in a variety of majors in Europe, Israel, Central America, and the Caribbean. These courses are designed to meet the needs of both traditional and nontraditional students (working students, parents, etc.). In addition, UAB has exchange agreements with educational institutions in more than 30 countries. Financial aid can be applied toward courses in the Study Abroad Program. Students must meet certain requirements to participate and earn academic credit.

Contact the UAB Study Abroad Program Director, (205) 975-6611, for further information concerning various programs, the resource library, references for peer consultation and academic advising, and financial aid applicability and contacts or check out the web site at **www.studyabroad.app.uab.edu/**.

International Scholars and Students

The mission of International Scholar and Student Services (ISSS) is to provide quality services, programs, and activities that enhance cultural awareness, international educational and research opportunities, and global perspectives for students, faculty, and staff.

ISSS advises foreign students and assists visiting international faculty and students in matters of immigration, federal and state taxation, and orientation to the Birmingham community. ISSS also serves as a collaborative resource center that facilitates, promotes, and strengthens international understanding.

The ISSS manages and operates the Smolian International House (I-House), located at 1600 10th Avenue South. The I-House offers a variety of services and activities for international students and scholars as well as for American students.

The ISSS also manages and operates the Samuel Ullman Museum (SUM), located at 2150 15th Avenue South. The museum is a tribute to Samuel Ullman, an early visionary of Birmingham best known for his poem "Youth."

For additional information, visit the International Scholar and Student Services web site **www.uab.edu/isss**.

Oak Ridge Associated Universities

Since 1971, students and faculty of the University of Alabama at Birmingham have benefited from its membership in Oak Ridge Associated Universities (ORAU). ORAU is a consortium of 85 colleges and universities and a contractor for the U.S. Department of Energy (DOE) located in Oak Ridge, Tennessee. ORAU works with its member institutions to help their students and faculty gain access to federal research facilities throughout the country; to keep its members informed about opportunities for fellowship, scholarship, and research appointments; and to organize research alliances among its members.

Through the Oak Ridge Institute for Science and Education (the DOE facility that ORAU operates), undergraduates, graduates, postgraduates, and faculty enjoy access to a multitude of opportunities for study and research. A comprehensive listing of these programs and other opportunities, their disciplines, and details on locations and benefits can be found in the *ORISE Catalog of Education and Training Programs*, which is available at **www.orau.org/** .

Dauphin Island Sea Lab

As a member of Alabama's Marine Environmental Sciences Consortium, UAB offers students and faculty access to the courses and facilities of the Dauphin Island Sea Lab, located in Mobile Bay on Alabama's Gulf Coast. For programs and contacts, visit their web site (**www.disl.org**).

Birmingham

Birmingham is a dynamic, progressive urban center of great natural beauty. Over a million people live in the metropolitan area, which includes parts of seven counties in north-central Alabama. Because of its rapid growth in the late 19th and early 20th centuries, Birmingham has an international flavor and ethnic diversity that are unusual in the South. This diversity has been enhanced in the last three decades by the phenomenal growth of UAB.

Health care and education have replaced other types of industry as Birmingham's economic base, and UAB is now the city's leading employer. Birmingham's economy is fully diversified, with rapid growth in service, financial, insurance and real estate, wholesale trade, construction, and research fields. Construction is thriving in Birmingham, with rapid suburban growth and massive revitalization and renovation of historic structures downtown. Despite the city's rapid growth, the American Chamber of Commerce rates the cost of living in Birmingham lower than in most metropolitan areas.

In addition to UAB and the University of Alabama School of Medicine, educational opportunities in the area include six other universities and colleges, seven community/junior colleges, five degree-granting technical schools, three law schools, and other specialized schools. The Birmingham area has houses of worship that represent virtually all denominations. School systems cover 5 county and 13 major city public school systems and over 50 private and denominational schools. Medical services are provided by 22 hospitals in located in the metro Birmingham area.

Located in the Sun Belt, Birmingham enjoys an average year-round temperature of 62°F, experiences approximately 117 days with rainfall each year and, in an average year, gets 2.1 inches of snowfall. The first freeze is usually in November, with the last frost in March.

Birmingham offers its residents and visitors many opportunities for both excitement and relaxation. Ongoing events take place at more than 40 movie screens, 5 community theaters, and numerous concert venues, including Oak Mountain Amphitheatre and Birmingham Jefferson Civic Center. In addition, a host of nightclubs and restaurants feature live entertainment.

The Birmingham Museum of Art, with a permanent collection of over 1,700 works, is the largest of the area’s museums. The Birmingham Botanical Gardens and facilities at Oak Mountain State Park serve as avenues into the wonders of natural history. For those with specialized interests, the city offers the McWane Center and IMAX Dome Theatre, Barber Vintage Motorsports Museum, the Alabama Sports Hall of Fame, the Jazz Hall of Fame, the Southern Museum of Flight, and many others. An interactive walk-through history at the Birmingham Civil Rights Institute, located in the heart of the Birmingham Civil Right’s District, which centers on the historic 16th Street Baptist Church.

Special events include the Birmingham International Festival of the Arts, which salutes art and craft from a different country each year; City Stages, a world-class musical festival held in the heart of downtown each June; and Do Dah Day, a whimsical parade of pets that marches through the numerous parks on Highland Avenue.

For people and families who are attracted to the outdoors, Alabama offers 24 state parks. Oak Mountain State Park, located in the Birmingham area, is the largest (9,940 acres).

Dozens of smaller city parks offer further opportunities for hiking, biking, swimming, rappelling, and other sports as well as quiet places for outdoor reading, studying, and picnicking. Alabama Adventure Theme Park thrills visitors with roller coasters, water rides, and other amusements. The Robert Trent Jones Golf Trail takes in the Oxmoor Valley Golf Club; this and other world-class courses make golf a popular pastime for residents and tourists alike. Less than one day's drive away, the mountains of middle Tennessee and the renowned "sugar beaches" of the Gulf of Mexico showcase the natural beauty of the southeastern United States.

Much of information in this section was drawn from the Birmingham Area Chamber of Commerce (**www.birminghamchamber.com**).

The Graduate School

Currently, the Graduate School administers doctoral programs in 35 areas and master's level programs in 44 areas, with additional programs planned for future implementation. A particular strength of the school is its many programs that unite different disciplines and cross departmental and school lines.

Graduate Council

The Graduate Council has developed policies and procedures to ensure that high standards for graduate study are maintained at UAB. These policies and procedures, available at the Graduate School's web site, are the joint responsibility of the Graduate Council and the dean of the Graduate School.

The Graduate Council, 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 Graduate Council, through its Advisory Committee, annually reviews academic requirements, policies, procedures, and Graduate School activities and recommends appropriate changes. Changes in academic requirements and related policies require a majority vote of the Graduate Council.

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 policy 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 academic 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. Detailed information about the GSA can be found at the GSA web site (**www.uab.edu/gsa**).

Industry Roundtable

The UAB Industry Roundtable, sponsored by the UAB Graduate School, 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 alternative career opportunities. The web site (**www.uab.edu/roundtable**) has more information.

Graduate Student Research Days

Graduate Student Research Days is an annual competition in which graduate students present their original research in an open forum. Deadlines for Research Days are announced in the fall semester and are available at the Graduate Student Research Days web site, (**www.uab.edu/graduate/researchday**). Awards are presented at a luncheon ceremony each spring semester.

Application and Admission

The Graduate School welcomes applications from all qualified individuals who wish to pursue graduate study at UAB.

Categories of Graduate Student

Two broad categories of graduate students are recognized: degree-seeking graduate students 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 application form, 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 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 Website (**http://main.uab.edu/sites/gradschool/students/prospective/**).

Complete Application Package

The completed application package includes (1) the completed application form; (2) a check for the appropriate processing fee (stated on the form); (3) two copies of official transcripts**[1]** from all colleges or universities attended (the applicant must arrange for these to be sent directly to the Graduate School Office); (4) official copies of the applicant's scores on the Graduate Record Examination (GRE) General Test**[2]**, (5) three evaluations, preferably on the Graduate School Evaluation Form**[3]**; (6) (for international applicants from non-English-speaking countries only) official copies of the applicant's scores on the Test of English as a Foreign Language (TOEFL) and the Test of Written English (TWE; see individual program sections for minimum score requirements).

Application packages, in general, will not be considered until the package is complete. To allow time for the application review process, all documents must be received in the Graduate School office at least six weeks before the beginning of the term in which the applicant wishes to begin the graduate program. Some graduate programs admit only at certain times of the year and have specific application deadlines. These deadlines are indicated in the online program descriptions.

Admission Standards

Admission is competitive and is based on an estimate of the ability of the applicant to complete the degree program successfully and on the appropriateness of the program to the applicant's career goals. The Graduate School and its programs accept the most qualified students who apply. Most programs can accommodate only a limited number of students; therefore, some qualified applicants may be denied admission.

Master's Degree Programs

Although each graduate program sets its own minimum standards for admission, the Graduate School has established guidelines for admission to master's degree programs. These guidelines are based on levels of achievement that most successful applicants have attained and include: (1) a B average (computed overall, or alternatively computed over the last 60 semester hours of earned credit) in undergraduate work, (2) evidence of a bachelor's degree from a regionally accredited university or college in the United States, (3) a score of at least 500 on the Verbal and Quantitative sections of the Graduate Record Examination General Test (some Masters programs require or accept scores from other standardized tests; some do not require submission of scores from a standardized test), and (4) previous academic work appropriate to the academic area to which application is being made. It should be emphasized that these are not absolute requirements imposed by the Graduate School. Programs may admit students whose prior achievements do not meet all of these criteria. For example, attaining the GRE scores indicated may be less relevant in some disciplines. Program specific guidelines for admission can be obtained directly from the program web site or from the director of the program in which you are interested.

Doctoral Degree Programs

Although each graduate program sets its own minimum standards for admission, the Graduate School has established guidelines for admission to doctoral degree programs. These guidelines are based on levels of achievement that most successful applicants have attained and include: (1) a B average (computed overall, or alternatively computed over the last 60 semester hours of earned credit) in undergraduate or subsequent graduate work, (2) evidence of a bachelor's degree from a regionally accredited university or college in the

United States, (3) a score of at least 550 on the Verbal and Quantitative sections of the Graduate Record Examination General Test (some programs require or accept scores from other standardized tests), and (4) previous academic work appropriate to the academic area to which application is being made. It should be emphasized that these are not absolute requirements imposed by the Graduate School. Programs may admit students whose prior achievements do not meet all of these criteria. For example, attaining the GRE scores indicated may be less relevant in some disciplines.

Note that some programs also require a master's degree before admission into the doctoral program. Because of guidelines set by external accreditation authorities, the requirements for application and admission to certain graduate programs may differ from those indicated above, particularly with regard to the standardized test required. Specific program requirements are detailed in the online program descriptions.

Special Conditions of Admission

Conditional Admission **-** Students not meeting all program admission criteria may be admitted conditionally upon recommendation by the graduate program director and approval by the dean of the Graduate School. Students admitted conditionally are required to attain a *B* average in their first 12 semester hours of graduate coursework attempted. Failure to do so will result in dismissal.

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 allowed 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 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 you were 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 application form, together with the required processing fee. These forms can be obtained online at **www.uab.edu/graduate/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 on 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. Employees must register online for UAB's Educational Assistance Program. Employees are required to ciertify themselves and any eligible dependents/spouses that plan to enroll in classes. For more information regarding Educational Assistance, visit **http://main.uab.edu/show.asp?durki=44429**.

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[1] Official transcripts are those issued by the registrar or responsible head of the institution at which the work was attempted or completed and sent by mail directly to the Graduate School by that official. In those rare instances in which international applicants are unable to provide official transcripts, certain certified documents may be acceptable.

[2] GRE scores must be sent directly from the testing agency to the Graduate School. (Some UAB graduate programs require, or are willing to accept, other recognized national tests. Specific program requirements are outlined in the online program descriptions.) Although ETS retains scores up to five years, some programs will not accept scores more than two years old.

[3] Evaluation forms are not required for the business programs.

General Academic Requirements

Unless otherwise stated, the policies in this section apply to both degree-seeking and non-degree-seeking graduate students.

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 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 (**www.uab.edu/graduate/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 postbaccalaureate 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 700-740 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 recommendation 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 Absence

A graduate student may request a leave of absence. The request for a leave of absence may not exceed one (1) academic year. The *Request for Leave of Absence form* can be found at the Graduate School Web site (**http://www.uab.edu/graduate/apply/acrobat/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 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. The UAB class schedule can be found 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, including required signatures.

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 in the UAB Class Schedule. **Mere cessation of class attendance does not constitute withdrawal, either academically or for tuition charges**. A grade of W will be entered on the transcript. Withdrawal is not possible after the last day of classes.

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*. This form can be obtained online at www.uab.edu/graduate/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. 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*, because 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).

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*. 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.

GPA

The GPA 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 GPA 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 Admission and Dismissal

Students who are admitted conditionally must demonstrate their ability to perform at the level required for graduation by establishing good academic standing at the end of the semester when their graduate semester hours attempted equals or first exceeds 12. Students who do not accomplish this level of performance will be dismissed from the UAB Graduate School.

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. See **UAB Student Records Policy**.

Conduct and Appeal

Academic Conduct

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 insure 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, copying other's 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 will be given the grade of *F* in the course in which the misconduct occurred. The program in which the student is housed may expel the student from the university on the first offense. Students should consult the policies of their graduate program to determine if expulsion can occur with a first offense. If, as determined by the records of the Graduate School, 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."

When an instructor sees cause to charge a student with academic misconduct, the instructor will communicate the charge to the department chair/program director appropriate to the course, who will notify the student of the charge and provide the student with an opportunity to respond. If, at that time, the student cannot refute the charge effectively, the department chair/program director will expeditiously notify the student and the director of the student's program in writing, 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 the letter with appropriate documentation will be sent to the graduate dean, who will maintain records of all proceedings. If the department chair/program director is the instructor who charges the student with academic misconduct, then another faculty member from the department or program, appointed by the graduate dean will review the charge and take appropriate actions.

If the charge is not resolved to the student's or faculty member's satisfaction within a school, either party may request an appeal by the Graduate School Appeals Board. The decision of the Graduate Appeals Board is final.

Academic misconduct that involves possible criminal action will be referred to other appropriate offices within the institution. Students and faculty should also consult the university's policy on scientific misconduct for discussion of standards and policies that apply to research and research courses.

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) provides safety for property and persons. Through appropriate "due process" procedures, disciplinary action will be taken in response to conduct that violates these principles. 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 vice president for student affairs has the responsibility for coordinating policies and procedures regarding students' nonacademic misconduct.

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.

Responsibilities of the Graduate Assistant

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 require notification of an approval by the mentor or graduate program director and may be extended, if necessary, with the permission of the graduate program director. Program policies regarding leaves of absence must apply equitably to all full time students in good standing in the program. 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. Students should consult the Graduate School Policies and Procedures concerning leaves of absence. In emergencies, graduate assistants should inform their mentors or program directors as soon as possible about the need for a leave of absence.

Requirements for the Master's Degree

Specific requirements apply to the master's degrees administered by the Graduate School.

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 do not always use a graduate study committee, particularly where flexibility in the course of study is limited by accreditation and other external constraints.) 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 bring 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. The graduate program director submits these recommendations to the Graduate School dean, who is an *ex officio* member of all graduate study committees.

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.

Where both Plan I and Plan II are available within one 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.) All transfers must be initiated by the student and require the approval of the graduate program director and the Graduate School Dean. An application for transfer of credit will not be considered until the student has completed at least six 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 is 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, that 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.

Candidacy for Degree

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 need 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.

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. Students must be admitted to candidacy before they can

register for thesis research hours (i.e., 699). Forms are available online at www.uab.edu/graduate/forms.

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 check completion of requirements, order the diploma, and enter the student in the commencement program, the form must be received in the Graduate School Records Office no later than 3 weeks into the semester of expected graduation. See deadline dates (http://main.uab.edu/sites/gradschool/students/current/deadlines/). Students must be registered for at least 3 semester hours of graduate work in the semester they plan to graduate. Forms are available online at www.uab.edu/graduate/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 with 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/theses_dissertation/FormatManual.pdf).

No later than 2 weeks (10 business days) following the public defense, the completed document, as a single PDF on a good quality CD, must be submitted to the Graduate School for final review. Master's students submit the Approval Form, signed by each committee member and the program director, and a completed UAB Publication Agreement form. Additional information concerning completing the final steps of the publication process is available online at http://main.uab.edu/sites/gradschool/students/current/theses/.

Additional assistance is available for students registered in GRD 704 (offered every semester by the Professional Development Program).

Masters Thesis Defense

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.

Final Examination

Under Plan I, the final examination should take the form of a presentation and defense of the thesis, followed by an examination of the candidate's comprehensive knowledge of the field. Plan I examinations must be scheduled through the Graduate School. The meeting must be appropriately announced in the UAB Reporter, must be open to all interested parties, and must take place at least 30 days before the expected date of graduation. Plan I candidates must be registered for at least 3 semester hours of graduate work in the semester during which degree requirements are completed.

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 used 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. 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 the 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 student will receive the degree from the president of the universit.

Summary of Steps Toward the Master's Degree

Admission to master's degree program
- Selection of faculty advisor
- Maintenance of good standing
- Appointment of graduate study committee—Plan 1 (Thesis) only
- IRB and/or IACUC approvals obtained
- Admission to candidacy--at least one semester before graduation is expected—Plan 1 (Thesis) only
- Application for Degree--no later than 3 weeks into the semester graduation is expected
- Production of preliminary version of thesis (Plan I only)
- Final examination (includes defense of thesis for Plan I only)
- One copy of defended committee-approved version of thesis to Graduate School office (Plan I only)--no later than 10 days after the public defense
- Conferring of degree

NOTICE: Students who fail to submit a completed thesis within one semester following the final examination (public defense) will be charged a degree completion fee each semester.

Requirements for the Doctoral Degree

Specific requirements apply to the doctoral degrees (PhD, EDD) that the Graduate School administers.

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, a major project undertaking may be acceptable even though it may not be of a traditional research nature. However, in all programs, with the exception of DPT, a dissertation is required, presenting the results of the student's independent study.

The Graduate School also recognizes professional doctorates awarded in preparation for the autonomous practice of a profession. Professional doctorates are accredited programs of study designed to prepare students for the delivery of clinical services. Students in professional doctorate programs must demonstrate competence in clinical practice and scholarship but are not required to conduct and defend original independent research. In lieu of a dissertation, students in programs designated as professional doctorates 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 met by the design and conduct of a research or scholarly project submitted in writing and presented formally before the members of 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 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, two of whom should be from outside the student's graduate specialization and each of whom should be able to bring some relevant insight and expertise to guide the student. Recommendations for graduate study committee members are submitted by the advisor and the student to the program director, who subsequently

submits these recommendations to the Graduate School dean. Graduate study committee appointments are made by the Graduate School dean, who is an *ex officio* member of all graduate study committees.

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). 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 transfers 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://main.uab.edu/sites/gradschool/students/current/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 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, unused credits from the previous program are eligible for consideration for transfer into the current program.

Minimum Course Credit Requirements

If entering with a baccalaureate degree:
1. Completion of 48 credit hours of course work prior to candidacy
2. Up to 16 credits of the 48 can be as non-dissertation research credits
3. Up to 10 credits can be as lab rotation, seminar, or directed study credits
4. Must complete at least two semesters as a full time student in candidacy or accumulate at least 24 credits in 799 research or course work in candidacy.

If entering with a previous Master's degree appropriate to the Ph.D. degree field (Also applies to previously earned M.D., D.V.M., D.D.S., etc.):
1. Completion of 27 credit hours of course work prior to candidacy
2. Up to 6 credits of the 27 can be as non-dissertation research credits
3. Up to 6 credits can be as lab rotation, seminar, or directed study credits
4. Must complete at least two semesters as a full time student in candidacy or accumulate at least 24 credits in 799 research or course work in candidacy.

Program requirements for course work may exceed the Graduate School minimums. Courses taken at other institutions and in other degree programs may be used to satisfy program requirements upon approval of the graduate study committee and the graduate program director. Doctoral students are expected to be registered for credit hours each semester

Registration Requirements

Because the doctoral degree is earned on the basis of satisfactory completion of the comprehensive examination and the dissertation, the Graduate School does not specify any minimum number of courses or semester hours that must be completed for awarding of the degree. Courses taken at other institutions and in other degree programs may be used to satisfy program requirements upon approval of the graduate study committee and the graduate program director. Doctoral students are expected to be registered for credit hours each semester.

Residence Requirement

The usual minimal period in which the doctoral degree can be earned is 3 academic years of full-time study, or longer if the student has periods of part-time enrollment. The nature of doctoral study requires the closest 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 done directly under the guidance and supervision of a regular member of the UAB graduate faculty. Therefore, Ph.D. 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 or stop out during the course of their Ph.D. 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 should precede the oral so that there is an opportunity for the student to clarify any misunderstanding of the written questions.

Students must be registered for at least 3 semester hours of graduate work during the semester in which the comprehensive examination is taken.

Admission to Candidacy

When the student has passed the comprehensive examination, satisfied any program requirements for foreign language proficiency or special tools of research, and presented to the graduate study committee an acceptable proposal for research or special study, the committee will recommend to the Graduate School dean that the student be admitted to candidacy. A student must be in good academic standing to be admitted to candidacy. 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. 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 doctorate. By this step, the graduate committee indicates its confidence that the student is capable of completing the proposed research project and the doctoral program. Because the committee meeting at which candidacy is discussed is so important, it should be scheduled through the Graduate School to allow the dean to attend.

Application for Degree

Each candidate for a doctoral 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 check requirements, order the diploma, and enter the student on the commencement program, it must be received in the Graduate School Records Office no later than 3 weeks into the expected semester of graduation. See deadline dates located on the Graduate School website. Forms are available from the Graduate School office or online at www.uab.edu/graduate/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 www.uab.edu/graduate/theses_dissertation/FormatManual.pdf).

No later than 2 weeks (10 business days) following the public defense, the completed document, as a single PDF on a good quality CD, must be submitted to the Graduate School for final review. Along with the finished document, doctoral students must complete and submit the following forms: the Approval Form, signed by each committee member and the program director, the UAB Publication Agreement, the ProQuest/UMI Publication Agreement, and the Survey of earned Doctorates. Doctoral students also pay a $60 submission fee to cover publication in the ProQuest/UMI dissertation database. Additional information concerning completing the final steps of the publication process is available online at http://main.uab.edu/sites/gradschool/students/current/theses/.

Dissertation Defense

If in the opinion of one or two of the 5 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 new dissertation 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 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.

Final 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 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 graduate work during the semester in which the final examination is taken.

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 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 a good academic standing to graduate, with no temporary grades for courses required for the degree on their transcripts.

Award of Degree

Upon approval by the Graduate School dean and payment of any outstanding financial obligations to the university, the student will be awarded the degree. Doctoral students are generally expected to complete all degree requirements with 7 years of matriculation.

Summary of Steps Toward 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 IACUC approvals obtained
- 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
- Production of preliminary version of dissertation
- Final examination--no later than 30 days before expected graduation
- One copy of defended committee-approved version of dissertation to Graduate School Office-- no later than 10 days following the public defense
- Conferring of degree

NOTICE: Students who fail to submit a completed dissertation within one semester following the final examination will be charged a degree completion fee each semester

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.

Academic Conduct

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 insure 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, copying other's 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 will be given the grade of *F* in the course in which the misconduct occurred. The program in which the student is housed may expel the student from the university on the first offense. Students should consult the policies of their graduate program to determine if expulsion can occur with a first offense. If, as determined by the records of the Graduate School, 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."

When an instructor sees cause to charge a student with academic misconduct, the instructor will communicate the charge to the department chair/program director appropriate to the course, who will notify the student of the charge and provide the student with an opportunity to respond. If, at that time, the student cannot refute the charge effectively, the department chair/program director will expeditiously notify the student and the director of the student's program in writing, 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 the letter with appropriate documentation will be sent to the graduate dean, who will maintain records of all proceedings. If the department chair/program director is the instructor who charges the student with academic misconduct, then another faculty member from the department or program, appointed by the graduate dean will review the charge and take appropriate actions.

If the charge is not resolved to the student's or faculty member's satisfaction within a school, either party may request an appeal by the Graduate School Appeals Board. The decision of the Graduate Appeals Board is final.

Academic misconduct that involves possible criminal action will be referred to other appropriate offices within the institution. Students and faculty should also consult the university's policy on scientific misconduct for discussion of standards and policies that apply to research and research courses.

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) provides safety for property and persons. Through appropriate "due process" procedures, disciplinary action will be taken in response to conduct that violates these principles. 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 vice president for student affairs has the responsibility for coordinating policies and procedures regarding students' nonacademic misconduct.

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 & 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 Grad School.*

I. Program Director and 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 students cannot work more than 10 hours per week outside their commitment to meet the requirements of their predoctoral program.

Policy 3: Minimum Course credit requirements in Ph.D. programs

A. If entering with a baccalaureate degree:

1. Completion of 48 credit hours of course work prior to candidacy
2. Up to 16 credits of the 48 can be as non-dissertation research credits
3. Up to 10 credits can be as lab rotation, seminar, or directed study credits
4. Must complete at least two semesters as a full time student in candidacy or accumulate at least 24 credits in 799 research or course work in candidacy

B. If entering with a previous Master's degree appropriate to the Ph.D. degree field: Also applies to previously earned M.D., D.V.M., D.M.D., D.D.S., etc.

1. Completion of 27 credit hours of course work prior to candidacy
2. Up to 6 credits of the 27 can be as non-dissertation research credits
3. Up to 6 credits can be as lab rotation, seminar, or directed study credits
4. Must complete at least two semesters as a full time student in candidacy or accumulate at least 24 credits in 799 research or course work in candidacy

C. Program requirements for course work may exceed the Graduate School minimums.

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 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 on the Maintenance of High Ethical Standards in Research and Scholarly Activities.

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 for 2-3 year terms by the Graduate Council Advisory Committee. Appointments will be staggered so that no more than 3 faculty and two graduate students will rotate off the committee in one year. Members may be re-appointed for a second term or a term may be extended in order to complete an appeal. The Graduate School will provide support personnel for the Board to record hearings.

D. Meetings:
The GSAB

1. will meet as soon as possible when notified by the graduate dean that an appeal is pending.
2. requires a quorum for a meeting of at least three persons: two Graduate Faculty members and at least one graduate student member. Any member of the GSAB may disqualify him/herself. 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 Advisory Committee can appoint additional members.

E. Notification:
The Chair of the GSAB will notify the student bringing the appeal and the university representative 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 university representative of the date, time, and place for the hearing. The Chair of the GSAB is responsible for notification of 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 university representative of his/her action.

F. Authority:

1. The GSAB may recommend affirming or reversing the decision being appealed and making such recommendations for further actions as seem appropriate.
2. In the course of any hearing, the GSAB is authorized to request the appearance or additional evidence of any student, faculty or staff member, or other employee of the University, or other individual as a witness.
3. The GSAB shall have final authority in procedural matters.
4. 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.

G. Procedures

1. Filing an appeal:

Before a request for an appeal is accepted by the GSAB, the normal channels for resolving disputes must have been consulted. First, the student should consult with his/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 for resolution. In some cases, if the advisor and department head have not been able to satisfy the appeal or the action still needs to be pursued, it may be appropriate to pursue the issue with the academic college dean. If the concern has not been resolved at any one of these levels, an appeal to the GSAB may be pursued. All requests for appeals must be submitted to the Dean of the Graduate School, in writing, on the approved form (see below) along with supporting documents, list of witnesses, 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.

2. 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 which fail to set forth grounds for an appeal shall be dismissed.

The GSAB will consider appeals when
a) all other levels of appeal have been exhausted
b) the student can show grounds that he/she was previously denied a fair hearing.
c) the decision being appealed is not supported by substantial evidence.
d) the sanction being imposed is beyond the authority of the personnel involved.
e) 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 preparation time before the hearing.

3. Hearings:
All hearings by the GSAB shall be subject to the following requirements:
a) 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.
b) Parties to the appeal have the right to be present and hear all arguments and oral statements made to the board.
c) 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.
d) Hearings shall not be adversarial in nature and shall be conducted in a manner conducive to ascertaining the facts of the case upon appeal.
e) The GSAB may establish time limitations for presentations before the Board Hearings shall be closed to the public.
f) GSAB members may address questions to any person giving testimony before the Board.
g) In hearings involving more than one student, a single hearing may be scheduled for each.
h) It shall be the responsibility of the Chair, together with the recording secretary, to see that the integrity of the record is maintained.
i) The Chair shall preside and rule on matters of procedure and evidence.
j) The Chair shall have the right to dismiss anyone from the hearing should his or her conduct become disorderly.

H. 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 for all findings and recommendations. In concluding its findings and recommendations, the Board shall only concern itself 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 (www.uab.edu/graduate).

Facilities and Services

Student access to libraries, housing, and medical insurance are among the university's priorities.

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. Its collections span 7 centuries of knowledge, from 13,000 volumes of rare historical books to approximately 1,500 print and thousands electronic journal subscriptions. Books, bound journals, microforms, and other media total approximately 350,000 volumes relating to medicine, dentistry, nursing, optometry, allied health sciences, public health, and the basic biomedical sciences.

Reynolds Historical Library

The Reynolds Historical Library was a gift of Dr. Lawrence Reynolds, a distinguished radiologist and editor. The collection includes ivory anatomical manikins, original manuscripts, and rare medical and scientific books.

Alabama Museum of the Health Sciences

The museum contains memorabilia from Alabama physicians, dentists, nurses, and optometrists, which present a history of the health sciences in Alabama since the time Alabama became a state.

Lister Hill Library at the West Pavilion

The Lister Hill Library maintains a small collection in the University Hospital West Pavilion to serve the clinical staff of the hospital. It includes 400 textbooks and 89 current subscriptions of the most frequently used journals. Photocopiers are available.

For more information about any of Lister Hill Library's services and facilities, please call 205-934-5460 (Administration) or 205-934-2230 (Information), or visit their web site (**www.uab.edu/lister**).

Mervyn H. Sterne Library

The Mervyn H. Sterne Library houses a collection of more than 1,500,000 items selected to support current teaching and research at UAB. In addition to books and more than 1,600 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. Through the use of OCLC, the national bibliographic utility, the staff can locate, and in many cases borrow, materials from libraries across the country. The User Services Department, through its automated circulation system, tracks materials continuously and can determine the location or status of a book on request. The reserve desk circulates high-use materials identified by classroom instructors.

Education Technology Services

Educational Technology Services (ETS) is the media center of the Mervyn H. Sterne Library. Located in the Education Building, ETS houses and circulates some 36,000 DVDs, video and audio tapes, records, and software programs for personal computers. Compact disks are available at the Sterne Library circulation desk. All formats of media may be located through SCOTTY, Sterne Library's online information system. Individual carrels are also available for groups or individuals to listen to or view nonprint media.

ETS also houses a computer lab cluster available on a first come basis. All machines allow you to access your campus e-mail account, surf the World Wide Web, and applications programs such as MS Word, Access, Excel, and PowerPoint. To use the computer resources in ETS, you must present a valid UAB ID at the ETS Computer Consultants Desk once per term in order to receive a login.

Libraries at Other Universities

Through an interinstitutional borrowing agreement, UAB students and faculty may use library facilities at a number of other colleges and universities in the area. Access to the catalogs of university libraries in the state of Alabama is available through the Mervyn Sterne Library web site.

For more information about any of Mervyn H. Sterne Library’s services and facilities, please call 205-934-6360 (Administration) or 205-934-6364 (Information), or visit the Sterne Library web site (**www.mhsl.uab.edu**).

Student Housing and Residential Life

Student residence halls, centrally located on campus, are within walking distance of all classroom buildings, libraries, and the Medical Center.

To live in student housing, you must be admitted to UAB and be in good standing. “Good standing” means you are not on academic or disciplinary suspension. You must be enrolled for 12 credit hours as an undergraduate student or 9 credit hours as a graduate student each semester. (Summer semester is treated differently.) You will be required to satisfy these eligibility standards throughout the term of your student housing contract, and you must inform UAB Student Housing and Residential Life if your status changes. Freshmen are not allowed to live alone (i.e., in a single or efficiency apartment) except in extreme circumstances.

UAB housing communities are designed to give you a sense of security 24 hours a day. A supervisor and five officers from the UAB Police's special Student Housing Police Precinct routinely patrol the residence halls and parking areas on both foot and bicycle. Officers interact with students and conduct programs and activities to help residents prevent crime. After dark, a designated UAB escort can accompany you to any on-campus destination by foot or in a marked vehicle.

Except for married students, only roommates of the same gender are permitted. To live in student housing, professional students, interns, residents, and postdoctoral fellows must by verified by their departments. Postdoctoral fellows must have a UAB classification of 20. Married students may live in suites in Camp or Denman halls if they meet certain eligibility requirements. UAB will require a copy of the marriage license to verify the relationship.

Current rental rates are available from the Department of Student Housing and Residential Life. Each room has a cable television connection and either a campus computer network connection or access to a 24-hour computer lab. Telephone service is available through UAB Communications.

Additional information concerning residential life and an application for housing may be obtained online through the UAB Web site www.students.uab.edu/services or you may have a paper application sent to you. Contact UAB Student Housing and Residential Life.

StudentHousing@uab.edu
(205) 934-2092
Fax: (205) 975-7297
Room G101, Denman Hall, 1604 9th Ave. S.
7:30 a.m. - 5:00 p.m. (M-F)
Mailing Address: DNMH 101, 1530 3rd Ave. S., Birmingham, AL 35294-1230

Because housing at UAB is limited, students should apply as early as possible in order to improve chances of getting the desired housing options.

Student Health and Insurance Programs

Student Health Service

The fee for participation in the Student Health Service plan is $75 per semester or summer session and $225 for a full year including the summer session.

Participation is required for all students in the Schools of Medicine, Dentistry, Joint Health Sciences, Public Health, Optometry, Health Related Professions, all international students, and students in the following programs: Engineering, Biology, Chemistry, Mathematics, Physics, and Psychology. Students in the preceding areas are also required to have major medical insurance to cover hospital, emergency room, specialty care referrals, and lab/x-ray costs which are not included in the basic Student Health plan.

Because preventive medicine is emphasized by the Student Health Service, information on medical matters of interest to students is offered. The service maintains a professional relationship with the student, and strictest confidentiality is maintained. Students in need of counseling services should contact the Counseling and Wellness Center (205-934-5816).

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 following health forms must be completed: (1) application for student insurance or waiver of insurance plan (this waiver is printed in red ink); and (2) health history in which the student fills out pages 1, 2, and 4 and your physician fills out page 3. The completed form must be sent to Student Health Service.

The Certificate of Immunization Form must be completed by all students and returned to the Graduate School office.

For additional information on UAB's Student Health Service and group hospital insurance plan, students should contact UAB Student Health Service, Suite 301, Community Health Service Building, 933 South 19th Street, Birmingham, Alabama 35294-2041 (telephone 205-934-3580 **www.uab.edu/studenthealth**).

Student Dental Health Program

A Student Dental Health Program is available to students enrolled in the schools of Dentistry, Medicine, Nursing, and Optometry. For more information, come by room 245 of the School of Dentistry at 1919 7th Avenue South or call 934-5234 after noon.

The UAB Dental Clinics offer low-cost care for students and community residents, while providing training for dental students. To register, go to the clinics between the hours of 8:30-10:30 a.m. or 1:00-2:30 p.m. The Dental Clinics are on the ground floor of the School of Dentistry Building at 1919 7th Avenue South or call 934-3000.

Student Development

Student Development comprises TRIO Academic Services, Career Services, Disability Support Services, Veterans Services, Testing Office, Counseling and Wellness Services, and Women's Services. All of these services are described online at www.students.uab.edu

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 in four years. 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 as they pursue their educational goals at UAB. Contact 205-934-2729 or TrioAcademicServ@uab.edu for detailed information.

UAB Career Services provides programs and services that help students to identify, refine, and pursue career aspirations. Services are extended to students from he moment of admission to UAB, continues on throughout enrollment at UAB, and continues on after graduation. Some services and programs include career counseling, career fairs, resource library, on-campus interviews, seminars, job listings, career assessments, and career information briefs. More information is located at the Web site, 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.

The Office of 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 of a veteran who has a service-related disability or who died while in the military. Contact veteransaffairs@uab.edu or 205-934-8804 for more information.

UAB Testing Center administers graduate examinations, correspondence exams, and professional certification/licensure exams (eg. ACT, APTTP, CLEP, DSST, GRE, MAT, MCAT, PRAXIS, SAT, TSE). Contact 205-934-3704 or testing@uab.edu for more information.

It is the goal of Counseling and Wellness Services to encourage students as they resolve problem areas and to help them cope with difficulties they are presently experiencing. Counselors are interested in supporting students as they find solutions. It is the role of the counselor is to listen, attempt to understand personal perspectives, and to be helpful to the fullest extent of his or her professional training. It is the client's responsibility to help the counselor learn about his or her life situation, thoughts, and feelings, and to have the courage to try to master identified problem areas. For more information about the Counseling and Wellness Center, call 205-934-5816.

The Women's Counseling Services offers personal (non-academic) counseling services to currently enrolled UAB students. These services are confidential, are provided by a Licensed Professional Counselor, and are free of charge to all UAB students. Issues dealt with by the Women's Center Counselor include (but are not restricted to) eating disorders, relationship problems, sexual assault and abuse, sexual harassment, and stress management. Personal counseling is the primary component of the Women's Center's services. For more information about the Women’s Center, call 205-934-6946.

Financial Information

UAB Payment Policies

Most universities require payment of tuition and fees at registration. UAB gives you this option but also offers alternatives.

Internal Payment Options

Payments can be made directly to UAB by cash, check, or credit cards (Visa, MasterCard, and Discover). Payment by mail should be directed to UAB Student Accounting Services; HUC 322, 1500 3rd Ave. S., Birmingham, AL. 35294-1150. Payments may be made in person in the Hill University Center, 1400 University Boulevard, in Room 322; Web payment is available through BlazerNET.

External Payment Option

Now there's a way to pay your tuition and fees in convenient monthly installments. UAB has partnered with Academic Management Services (AMS), which offers eight-month and 10-month tuition payment plans. With these plans, you and your family can spread out the cost of college. They also make it easy to set up a budget and figure out how much you need to save to cover your anticipated educational costs. To learn more, call an AMS consultant at 1-800-635-0120 or visit AMS online, www.amsweb.com.

Statement of Fees

A statement of fees is provided to each student at registration. 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 Statement of Fees printed at registration. However, even if you do not receive a statement, you are still responsible for payment by the deadlines. For information or clarification concerning the amount due, please call Student Accounting Services at 205-934-3570 or 1-888-255-8734.

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. (See the current class schedule for published delinquent fees on BlazerNET.)

Tuition Adjustment Policies

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 Without Paying 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, was of sufficient duration and severity to make it impossible for you to continue in the course.

Withdrawals and Refunds

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 form is received after the Last Day to Withdraw Without Paying Full Tuition and Fees, full tuition and fees will be due for the courses from which the student withdraws.

Academic Common Market

The Academic Common Market is an interstate agreement among selected southern 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 (www.cep.unt.edu/ACM.htm).

Financial Aid

Assistantships and Fellowships

The Graduate School realizes that pursuit of an advanced degree may involve financial strain. In many programs, graduate student awards are available in limited number in the form of assistantships (service required) or fellowships (no service required.)

Applications for assistantships or fellowships should be submitted to the director of the graduate program in which the student is, or plans to be, enrolled. Applications for minority fellowships are available in the Graduate School Office. 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. For information concerning these programs, contact the Office of Student Financial Aid, Room 317, Hill University Center, 1400 University Blvd, Birmingham, Ala-bama 35294-1150, 205-934-8223, **www.uab.edu/studentacct**

Veterans

Enrolled veterans and dependents that are eligible for federal educational benefits through the Department of Veterans Affairs should apply online at the VA website, www.GIBILL.va.gov. You may also pick up a paper application from UAB Veterans Affairs (UAB-VA) in the Office of Student Retention Programs. After processing your application, the Regional VA office will contact you in reference to your eligibility to receive benefits. 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 Rentention Programs, Room 524, Hill University Center, 1400 University Boulevard, Birmingham, AL 35294-1150, telephone 205-934-8804, email veteransaffairs@uab.edu.

Estimated Semester Fees[1], 2007-2008

General Fees Paid by All "Resident"[2] Graduate Students

Per semester hour

Graduate School $182.00

School of Public Health $189.00

School of Nursing $221.00

School of Health Professions $240.00

Student Service Fee[3]..... $ 42.00

(plus $10 per semester hour)

Building Fee, Academic Health

Center Students ..... $ 34.00

Building Fee, All Other Students ..... $ 34.00

(plus $3 per semester hour)

General Fees Paid by All "Nonresident"[5] Graduate Students

Per semester hour

Graduate School $455.00

School of Public Health $473.00

School of Nursing $553.00

School of Health Professions $600.00

Student Service Fee..... $ 42.00

(plus $8 per semester hour)

Building Fee, Academic Health

Center Students ..... $ 34.00

Building Fee, All Other Students ..... $ 34.00

(plus $3 per semester hour)

Special Fees, Paid Where Applicable[4]

Nondegree Application ..... $ 30.00

Domestic Application:

MAC, MBA ..... $ 50.00

MSHA..... $ 60.00

Public Health ..... $ 50.00

(PhD, dual programs only)

All other domestic applications..... $ 35.00

International Application:

MAC, MBA ..... $ 75.00

MSHA..... $ 85.00

Public Health ..... $ 75.00

All other international applications..... $ 60.00

Readmission Application Fee..... $ 30.00

Student Health Service Fee (per semester

plus initial processing fee)..... $ 75.00

Late Payment Fee ..... $ 50.00

Withdrawal Fee (for total withdrawal

during first 2 weeks of each semester) ..... $ 30.00

Reinstatement Fee ..... $ 150.00

Laboratory Fees..... $35.00–$100.00

Learning Resources (per credit hour)..... $4.00–$13.00

Online Fee (Internet Courses)..... $75.00 - $250.00

Recreational Center Fee

(12 credit hours or more)..... $72.00

(Fewer than 12 credit hours) ..... $ 48.00

Returned Check Fee..... $ 30.00

Transcript Fee by mail (except intercampus) ..... $ 5.00

Degree Completion (per semester)**[5]** ..... $ 250.00

Diploma Fees

Application for Degree..... $ 50.00

Reorder Diploma (if graduate requirements are

not met after diploma has been ordered) ..... $ 25.00

Duplicate Diploma Fee..... $ 25.00

Duplicate Diploma ..... $ 15.00

Dissertation Submission Fee ..... $ 60.00

Optional Copyright Fee ..... $ 65.00

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[1] This fee schedule is subject to change by the Board of Trustees at the beginning of any semester.

[2] See Nonresident Tuition Policy for definition of residency.

[3] Regular UAB employees are exempt from Student Service Fee.

[4] For applicability of these fees, see the current UAB Class Schedule.

[5] This fee is assessed when a student fails to complete the thesis or dissertation by the deadline for the semester following the semester of the final defense.

Graduate Faculty

Only regular graduate faculty are listed, not adjunct or ad hoc members. A complete list of graduate faculty members is available online at http://www.uab.edu/graduate/gradfac/.

UAB Graduate Program Directory

The online Graduate Catalog always reflects the most recent requirements and information pertaining to UAB's graduate programs. Previous years' catalogs are housed in the UAB libraries.

Arts and Humanities

Art History (M.A.)
Program description from the 2006-2008 Graduate Catalog

Communication Management (M.A.)
Program description from the 2006-2008 Graduate Catalog

English (M.A.)
Program description from the 2006-2008 Graduate Catalog

Biological/Biomedical Science

Biochemistry and Molecular Genetics (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Cell Biology (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Cellular and Molecular Biology (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Cellular and Molecular Physiology (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Genetics (Ph.D.)
Program description from the 2006-2008 Graduate Catalog.

Integrative Biomedical Sciences (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Microbiology (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Neurobiology (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Neuroscience Training Program (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Pathology (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Pharmacology and Toxicology (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Toxicology Training Program (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Vision Science (M.S., Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Business

Accounting (M.Ac.)
Program description from the 2006-2008 Graduate Catalog

Business Administration (M.B.A.)
Program description from the 2006-2008 Graduate Catalog

Dentistry

Dentistry (M.S.)
Program description from the 2006-2008 Graduate Catalog

Education

Education: General Information
Program description from the 2006-2008 Graduate Catalog

Education—Curriculum and Instruction
The following are a part of this category:
Early Childhood (M.A.E)
Elementary (M.A.E)
High School (M.A.E)
Art Education (M.A.E)
Music Education
English as a Second Language
Program description from the 2006-2008 Graduate Catalog

Education—Human Studies
The following are a part of this category:
Counseling (E.D.S)
Health (M.A.E)
Health Education and Health Promotion (Ph.D.)
Physical (M.A.E)
School Psychology
Program description from the 2006-2008 Graduate Catalog

Education—Leadership, Special Education, Foundations and Technology (M.A.E)
Program description from the 2006-2008 Graduate Catalog

Engineering

Biomedical Engineering (Ph.D., M.S.B.M.E.)
Program description from the 2006-2008 Graduate Catalog

Civil Engineering (M.S.C.E., Ph.D.*)
Program description from the 2006-2008 Graduate Catalog

Computer Engineering (Ph.D.*)
Program description from the 2006-2008 Graduate Catalog

Electrical Engineering (Ph.D.*, M.S.E.E.)
Program description from the 2004-2006 Graduate Catalog

Environmental Health Engineering (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Materials Engineering (Ph.D., M.S.Mt.E.)
Program description from the 2006-2008 Graduate Catalog

Materials Science (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Mechanical Engineering (Ph.D.*, M.S.M.E.)
Program description from the 2006-2008 Graduate Catalog

Health Professions

Administration—Health Services (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Clinical Laboratory Sciences (M.S.)
Program description from the 2006-2008 Graduate Catalog

Health Administration (M.S.H.A.)
Program description from the 2006-2008 Graduate Catalog

Health Informatics (M.S.H.I.)
Program description from the 2006-2008 Graduate Catalog

Nurse Anesthesia (M.N.A)
Program description from the 2006-2008 Graduate Catalog

Nutrition Sciences (Ph.D., M.S.)
Program description from the 2006-2008 Graduate Catalog

Occupational Therapy (M.S.) *
Program description from the 2006-2008 Graduate Catalog

Physical Therapy (DPT; D.Sc.P.T.)
Program description from the 2006-2008 Graduate Catalog

Surgical Physician Assistant Studies (M.S.P.A.S.)
Program description from the 2006-2008 Graduate Catalog

Medicine

Gerontology
Program description from the 2006-2008 Graduate Catalog

Medical Scientist Training Program (M.D., Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Natural Sciences and Mathematics

Biology (Ph.D., M.S.)
Program description from the 2006-2008 Graduate Catalog

Chemistry (Ph.D., M.S)
Program description from the 2006-2008 Graduate Catalog

Computer and Information Sciences (Ph.D., M.S.)
Program description from the 2006-2008 Graduate Catalog

Mathematics (M.S.)
Program description from the 2006-2008 Graduate Catalog

Mathematics, Applied (Ph.D.*)
Program description from the 2006-2008 Graduate Catalog

Physics (Ph.D., M.S.)
Program description from the 2006-2008 Graduate Catalog

Nursing

Nursing (Ph.D., M.S.N.)
Program description from the 2006-2008 Graduate Catalog

Public Health

Public Health (including M.P.H., M.S.P.H., and Dr. P.H.)
Program description from the 2006-2008 Graduate Catalog

Biostatistics (Ph.D., M.S., M.P.H.)
Program description from the 2006-2008 Graduate Catalog

Environmental Health Sciences (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Epidemiology (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Health Education/Health Promotion (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Social and Behavioral Sciences

Psychology (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Criminal Justice (M.S.C.J.)
Program description from the 2006-2008 Graduate Catalog

Forensic Science (M.S.F.S.)
Program description from the 2006-2008 Graduate Catalog

History (M.A.)
Program description from the 2006-2008 Graduate Catalog

Sociology (M.A.), Medical Sociology (Ph.D.)
Program description from the 2006-2008 Graduate Catalog

Public Administration (M.P.A.)
Program description from the 2006-2008 Graduate Catalog

Anthropology (M.A.*)
Program description from the 2006-2008 Graduate Catalog

Graduate School

Graduate School Professional Development Program
Program description from the 2006-2008 Graduate Catalog

ARTS AND HUMANITIES

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

Jessica Dallow, Assistant Professor (Art History); Contemporary Art and Criticism

Katherine McIver, Professor (Art History); Renaissance and Baroque Art

Heather McPherson, Professor (Art History); Modern Art (Eighteenth-Century-Contemporary)

Cathleen Cummings, Assistant Professor (Art History); Southeast Asian, Buddhist, and Islamic 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

Robert Mellown, Associate Professor (Art History); Nineteenth-Century 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. The applicant should have completed (with a B average) 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 three 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

Each student must demonstrate a reading knowledge of French or German. This is tested by examination 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. For students specializing in Asian art, another appropriate language, such as Chinese or Japanese, may be substituted. 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:	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.)
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) 996-6986

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. **Roman Art**. Art of the Roman world from republic to empire. Special attention to Roman Forum and painting in Pompeii. (McIver)

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

522 **Renaissance Art in Italy: 1480-1580**. Painting, sculpture, and architecture from major artistic centers of Florence, Venice, Rome, and Milan. (McIver)

523. **Study Abroad: Renaissance and Baroque Art in Italy**: On-site study of architecture in Italy, 1300-1650. (McIver)

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

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. (McIver)

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. (McIver)

540. **Nineteenth-Century Art I: Neoclassicism, Romanticism, and Realism**. Painting, sculpture, and graphic arts in Europe, emphasizing France, 1780-1850. (McPherson)

541. **Nineteenth-Century Art II: Impressionism, Post-Impressionism, and Symbolism.** Painting, sculpture, and graphic arts in Europe,1850-1900. (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)

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

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

568. **Race and Representation**. History of 20th-century African American art in 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)

573. **Japanese Prints and Printmakers**. History of Japanese wood-block prints and printmakers, 17th-20th centuries. (Cummings)

574. **Chinese Painting**. Painting and painting theory through the eighteenth century. (Cummings)

575. **Japanese Art**. Art and culture of Neolithic era through 19th century. (Cummings)

576. **Oriental Ceramics**. History and connoisseurship of ceramics of China, Korea, and Japan using originals in Birmingham Museum of Art. (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)

580. **Art Criticism**. Critical theory and contemporary issues focusing on art from 1960s to 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)

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

592. **Museum Internship**. This course will provide students with direct 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. (McIver)

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

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

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

670. **Seminar**: Asian Art. An in-depth survey of the art and culture of China from the Neolithic era through the eighteenth century. (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. (McPherson)

698. **Independent Study**.

*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, 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

Bert Brouwer, Professor (Art); Painting, Drawing

Gary Chapman, Professor (Art); Painting, Drawing

Derek Cracco, Associate Professor (Art); Printmaking

Christopher Lowther, Assistant Professor (Art); Multi-Media & Graphic Design

Sonja O. Rieger, Professor (Art); Photography, Drawing

Erin Wright, Associate Professor (Art); Graphic Design

Communication Management (M.A.)

Degree Offered: M.A.
Director: Jonathan Amsbary, PhD
Phone: (205) 934-3878
E-mail: **amsbary@uab.edu**
Web site: **cs.hum.uab.edu**

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
Entrance Tests	GRE or MAT (TOEFL and TWE for international applicants whose native language is not English.)
Comments	None

For additional information, contact Dr. Jonathan Amsbary, Program Director, 1055 Building, Room 212, 1055 11th Ave. S., Birmingham, AL 35294-4480.

Telephone 205-934-3878

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

Web **cs.hum.uab.edu**

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

611. **Seminar in Organizational Communication**. The study of communication theory, practice and research in the organization 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 Communication**. The study of communication theory and research as is applies to the various relationships within the healthcare system.

617. **Training and Development**. 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.

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.

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.

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.

English (M.A.)

Degree Offered:	M.A.
Director:	Dr. Kyle Grimes
Phone:	(205) 934-8580
E-mail:	**kgrimes@uab.edu**
Web site:	**www.uab.edu/english**

Faculty

Danny Anderson, Assistant Professor (English); Creative Writing

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

Tracey A. Baker, Associate Professor (English); Rhetoric and Composition

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

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

Robert J. Collins, Associate Professor (English); American Literature, Creative Writing

Linda Frost, Associate Professor (English); Early and Nineteenth-Century American Literature, Feminist Theory, Creative Writing

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

Ann Hoff, Assistant Professor (English); Modern Poetry and Poetics

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

Peggy B. Jolly, Professor (English); Rhetoric and Composition

Sue Kim, Assistant Professor (English); Contemporary Literature and Literary Theory, Postcolonial Studies, Ethnic Studies

Marilyn J. Kurata, Associate Professor (English); Nineteenth-Century British Novel, Victorian Poetry

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

P. Kieran Quinlan, Professor (English); American Literature

Cynthia Ryan, Associate Professor (English); Composition, Professional Writing, Public Discourse, Gender Theory

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

Virginia Whatley Smith, Associate Professor (English); African American Literature, American Literature

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

Stacy Tintocalis, Assistant Professor (English); Creative Writing

Lawrence G. Wharton, Associate Professor (English); American Literature, Fiction Writing

Jacqueline E. Wood, Associate Professor (English); African American Literature, American Literature

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 eight 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, and one must have a primary appointment outside the UAB English Department. 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.

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. Students may be admitted to candidacy after they have completed 24 hours of course work and satisfied at least three of the area test requirements either by passing the relevant tests or by fulfilling the necessary course work as outlined in item 3.

12. 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 three other faculty members to complete their GSC. All members of the GSC must be graduate faculty, at least one (in addition to the chair) should be another composition/rhetoric specialist, and one must have a primary appointment outside the UAB English Department. 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 2-12 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 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 three other faculty members to complete their GSC. All members of the GSC must be graduate faculty, at least one (in addition to the chair) should be another creative writing specialist, and one must have a primary appointment outside the UAB English Department. 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.)
Comments	None
Graduate Catalog Description	**http://main.uab.edu/show.asp?durki=24888**

For detailed information, contact Dr. Kyle Grimes, Graduate Program Director, Department of English HB 207, 1530 3rd Avenue South, Birmingham, AL 35294-1260.

Telephone 205-934-8580

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.

535. **Teaching Creative Writing**.

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 theories of art and literary production int he contexts of aesthetics and culture from Russian formalism to the present.

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 Dramatic Tradition**. Development of African American dramatic tradition from the nineteenth century through the Harlem Renaissance and Black Arts movement to contemporary postmodernism, including Brown, Hurston, Baraka, and Wilson.

548. **African American Poetry Tradition**. Development of African American poetry from its early works to the present, including Wheatley, Dunbar, Hughes, Brooks, 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, 1620-1820**. Representative American writing from the colonial period to Washington Irving.

562. **American Literature, 1820-1870**. Representative writers such as Alcott, Dickinson, Douglass, Emerson, Fern, Fuller, Harper, Hawthorne, Jacobs, Melville, Poe, Spofford, Stowe, Thoreau, Whitman, and Whittier.

563. **American Literature, 1870-1914**. Realism and naturalism as represented in works by Twain, James, Howells, Crane, Jewett, Wharton, Dreiser, Norris, Chopin, and others.

564. **American Literature, 1914-1945**. A study of some of the main texts fromt he period by 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**. Aninterdisciplinary 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.

582. **The Eighteenth Century: Theory and Interpretation**. 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**. Fielding, Defoe, Sterne, Smollet, and Richardson.

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.

*592. **Special Topics**. 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 communcaitons 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 wuthors 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 Associate Chair. 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.

BIOLOGICAL AND BIOMEDICAL SCIENCE

Biochemistry and Molecular Genetics (Ph.D.)

Degree Offered:	Ph.D.
Director:	Dr. Thomas Ryan
Phone:	(205) 996-2175
E-mail:	**tryan@uab.edu**
Web site:	**www.bmg-phd.com**

Faculty

Anupam Agarwal, Associate Professor (Medicine); molecular regulation of the human heme oxygenase-1 (HO-1) gene in renal injury and in atherosclerosis; functional significance of HO-1 gene expression is also being evaluated using both in vitro and in vivo systems in transgenic animal models; gene delivery approaches in the kidney and the vasculature in animal models of transplantation

G. M. Anantharamaiah, Professor (Medicine); Apolipoprotein Structure and Function

John R. Baker, Professor Emeritus (Biochemistry and Molecular Genetics); Structural Functions of Connective Proteoglycans

Stephen Barnes, Professor (Pharmacology); Hormonal Regulation of Hepatic Bile Salts Sulfation

Scott Blume, Research Assistant Professor(Medicine/Hematology Oncology); 5'-Untranslated RNA and Cell Proliferation/Survival

Thomas R. Broker, Professor (Biochemistry and Molecular Genetics); Human Papillomavirus, Transcription Regulation, DNA Triplexes, Epithelial Cells

Christie G. Brouillette, Research Professor (Optometry); Mutagenesis, Protein Folding and Interactions, Membrane Protein Structure

Debasish Chattopadhyay, Assistant Professor (Medicine/Geographic); Nucleic Acid Related Enzymes

Cheng-Yi Chen, Assistant Professor (Biochemistry and Molecular Genetics); Post-transcriptional Regulation of Gene Expression, mRNA Turnover, RNA Binding proteins

Igor Chesnokov, Assistant Professor (Biochemistry and Molecular Genetics); DNA Replication, Cell Division, Cell Cycle Regulation

Herbert C. Cheung, Professor (Biochemistry and Molecular Genetics); Mechanism of Contraction, Fluorescence Spectroscopy, Proteins

Louise T. Chow, Professor (Biochemistry and Molecular Genetics); Human Papillomavirus, Genetics, Keratinocytes, DNA Replication, Electron Microscopy

David Crawford, Assistant Professor (Hematology/Oncology); Cell Cycle Regulation, DNA damage checkpoints, Ubiquitin mediated protein degradation

Lawrence J. DeLucas, Professor (Optometry); Protein Crystal Growth

Peter J. Detloff, Associate Professor (Biochemistry and Molecular Genetics); Mouse Models of Human Genetic Diseases

Gabriel A. Elgavish, Professor (Biochemistry and Molecular Genetics); Paramagnetic Probes for NMR Investigation of Membrane Transport

Jeffrey A. Engler, Professor (Biochemistry and Molecular Genetics); Gene Cloning, DNA Sequencing, Virology

Leo M. Hall, Professor Emeritus (Biochemistry and Molecular Genetics)

N. Patrick Higgins, Professor (Biochemistry and Molecular Genetics); DNA Topology, Genetic Transposition, DNA Enzymology

Colleen Johnson, Adjunct Associate Professor (Southern Research Institute); Hantavirus, HIV, Ebola virus, drug discovery, molecular and biochemical virology

Natalia Kedishvili, Assistant Professor (Biochemistry and Molecular Genetics); Regulation of intracellular levels of bioactive retinoids and steroids in human tissues in health and disease

Christopher A. Klug, Associate Professor (Microbiology); Hematopoietic Stem Cell Development

N. Rama Krishna, Professor (Biochemistry and Molecular Genetics); NMR of Biomolecules, Molecular Endocrinology of Peptide Hormones

James C. Lacey Jr., Professor Emeritus (Biochemistry and Molecular Genetics)

Ming Luo, Professor (Microbiology); Viral Protein Structure

Joseph L. Messina, Associate Professor (Pathology); Diabetes, cancer, injury, infection, and surgical trauma are characterized by changes in cellular metabolism and function

Steven J. Pittler, Professor (Vision Sciences); Development of transgenic animal model to test a pharmacologic treatment for retinitis pigmentosa; structure and regulation of retinal cGMP PDe alpha gene

Kirill Popov, Associate Professor (Biochemistry and Molecular Genetics); Multienzyme complexes, Protein kinases, Protein phosphatases, Metabolic control

Peter E. Prevelige, Jr., Professor (Microbiology); Viral Capsid Self-Assembly: Defining the Underlying Subunit-Subunit Interactions and Their Potential as Therapeutic Targets

David G. Pritchard, Professor (Biochemistry and Molecular Genetics); Molecular Basis for the Pathogenicity of Gram-Positive Bacteria

Kenneth M. Pruitt, Professor Emeritus (Biochemistry and Molecular Genetics); Chemistry of Non-Immunoglobulin Defense Mechanisms

Lennart Roden, Professor Emeritus (Biochemistry and Molecular Genetics); Structure, Biosynthesis, and Catabolism of Connective Tissue Polysaccharides

Thomas M. Ryan, Assistant Professor (Biochemistry and Molecular Genetics); Gene Regulation, Stem Cells, Mouse Models, Mutagenesis, Cell therapies

Jere P. Segrest, Professor (Pathology); Plasma Lipoprotein Structure and Function

Tamas Simor, Research Assistant Professor (Assoc. Prof. University of Pecs, Faculty of Medicine; Elgavish Paramagnetic, Inc.); MR spectroscopy, spectrocopic imaging and imaging studies, developing new methods for the diagnosis of IHD and developing 31P SI methods for the diagnosis and evaluation of human temporal lobe epilepsy

Narayana Sthanam, Associate Professor (Optometry); Structure-Based Inhibitor Design for Human Complement Activating Serine Proteases

Theresa V. Strong, Associate Professor (Medicine); Gene Therapy for Cancer and Inherited Disease

Kenneth B. Taylor, Professor Emeritus (Biochemistry and Molecular Genetics); Fermentation Technology

J. Anthony Thompson, Professor (Surgery); Regulation of Eukaryotic Gene Expression

Tim M. Townes, Professor and Chair (Biochemistry and Molecular Genetics); Regulation of Gene Expression During Development

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.

Scott M. Wilson, Assistant Professor (Neurobiology); Investigation into the role of the ubiquitin-proteasome pathway in the nervous system

Bu Xu, Adjunct Assistant Professor (SRI); Studying mechanisms that control cellular reponse to DNA damage agents

PROFESSORS EMERITI

John R. Baker, Professor Emeritus (Biochemistry and Molecular Genetics); Structural Functions of Connective Proteoglycans

Herbert C. Cheung, Professor Emeritus (Biochemistry and Molecular Genetics); Mechanism of Contraction, Fluorescence Spectroscopy, Proteins

Leo M. Hall, Professor Emeritus (Biochemistry and Molecular Genetics)

James C. Lacey Jr., Professor Emeritus (Biochemistry and Molecular Genetics)

Edward J. Miller, Professor Emeritus (Biochemistry and Molecular Genetics); Structure and Biosynthesis of the Animal Tissue Collagens

Kenneth M. Pruitt, Professor Emeritus (Biochemistry and Molecular Genetics); Chemistry of Non-Immunoglobulin Defense Mechanisms

Lennart Roden, Professor Emeritus (Biochemistry and Molecular Genetics); Structure, Biosynthesis, and Catabolism of Connective Tissue Polysaccharides

Kenneth B. Taylor, Professor Emeritus (Biochemistry and Molecular Genetics); Fermentation Technology

Objective of the Graduate Program

The biochemistry and molecular genetics graduate program's primary objective is to provide high-quality, multidisciplinary training leading to the Ph.D. degree. Students who complete this program are expected to make significant future contributions in research in the basic biomedical sciences and to teach future generations of competent and productive research scientists.

The program consists of a core curriculum that emphasizes (a) the multidisciplinary and quantitative aspects of modern biomedical sciences; (b) a diversity of laboratory research training experiences; and (c) the development of skills in reading, writing, and speaking. Advanced students take courses and tutorials in specialized areas of interest, participate in seminars, and have opportunities to gain teaching experience while satisfying other requirements for their doctoral programs.

Areas of specialization for Ph.D. dissertation research include general and intermediary metabolism; molecular biology; virology; medical genetics; physical biochemistry; endocrinology; biosynthesis, structure, and assembly of biological macromolecules, membranes, and organelles; developmental and molecular cell biology; host-parasite relationships and host defense; X-ray crystallography of proteins and nucleic acids; and connective tissue biochemistry.

Admission Requirements and Financial Aid

There are two avenues for entry into graduate study in the Department of Biochemistry and Molecular Genetics. The department participates in the multidisciplinary Cellular and Molecular Biology (CMB) Program, which is designed to provide a first-year curriculum to graduate students interested in the broad area of cellular and molecular biology. At the end of the first year, each CMB student chooses a mentor and elects to pursue a degree in biochemistry, in cell biology, in microbiology or in neurobiology. Alternatively, prospective students with a specific interest in biochemistry may choose to apply directly to faculty in the Department of Biochemistry and Molecular Genetics for admission to graduate study. The first-year curriculum provides students with a comprehensive experience in biochemistry, cell biology, microbiology, neurobiology, virology, and immunology.

Both the CMB and the biochemistry admissions committee consider applications for admission to the Ph.D. program from prospective graduate students who present evidence of superior scholarship and who have completed courses in general, organic, and physical chemistry; mathematics, including calculus; and physics. Completion of courses in biology, including genetics and biochemistry, is also recommended. Students with M.S., M.D., D.D.S., and D.V.M. degrees are also encouraged to apply.

Admission criteria for the Ph.D. program are those of the Graduate School, plus a personal interview. Students accepted into the program during the last several years have had an average score of greater than 600 on the quantitative section of the GRE General Test and 1,200 on the combined verbal and quantitative sections. These students also have had average undergraduate grade point averages of at least 3.0 on a 4.0 scale. All students accepted into the program are provided fellowships or traineeships. Fellows and trainees are required to undertake full-time studies and are not permitted to do any other remunerative work. Financial support will be continued for up to five years, provided that the student's performance is satisfactory. During the 2004-2005 academic year, entering students will be provided with stipends of $21,000 per year, single health coverage and funds for tuition and fees. These amounts are reviewed yearly.

Additional Information

Deadline for Entry Term(s):	Apply to the Biochemistry and Molecular Genetics Program. You may apply on line, or contact the Biochemistry and Molecular Genetics Program Director by e-mail (**tryan@uab.edu**) or Mrs. Vickers(**gradbmg@uab.edu**) for an application package.
Deadline for All Application Materials to be in the Graduate School Office:	Applications are accepted on a rolling basis but early applications stand a better chance. Foreign student deadline is Jan. 15
Number of Evaluation Forms Required:	Three
Entrance Tests:	GRE, TOEFL (foreign applicants)

Contact Information

For detailed information, contact Dr. Thomas Ryan, Graduate Program Director, UAB Department of Biochemistry and Molecular Genetics, MCLM 572, 1918 University Blvd., Birmingham, Alabama 35294-0005.

Telephone 205-996-2175

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

Web **www.uab.edu/biochem**

Course Descriptions

Courses are for three semester hours of credit unless otherwise noted.

Cellular and Molecular Biology (CMB)

Request CMB information for complete course descriptions.

712. **Methods and Logic in Biology**. 1 hr. (Choose CMB 790 and/or CMB 712)

713. **Cellular and Molecular Biology I**. Biomolecules. 4 hours.

720. **Cellular and Molecular Biology II**. Genes. 4 hours.

730. **Cellular and Molecular Biology III**. Cells. 3 hours.

790. **Laboratory Methods**. 1 hr. OR (Choose CMB 790 and/or CMB 712)

Check Spring Class Schedule for course and call numbers to be out in the Fall.
Choose one course from each module.

Cell and Molecular Biology -IV Module 1: 3 hrs
CMB 741-VT-Bacterial Genetics & Physiology (Janet Yother)
CMB 742-VT-Cell Signaling (Xinbin Chen)

Cell and Molecular Biology-V Module 2: 3 hrs
CMB 754-VT-Cell. & Molec. Neurosci. (Lucas Pozzo-Miller)
CMB 755-VT-Cell & Molec. Aspects of Dev. Bio. (Brad Yoder)
CMB 756-VT-Virology (Peter Previlege)
CMB 743-VT Molecular Enzymology (Kirill Popov)

Cell and Molecular Biology -VI Module 3: 3 hrs
CMB 761-VT-Eukaryotic Genetics (Peter Detloff)
CMB 762-VT-Immunology (Peter Burrows/Scott Barnum)
CMB 763-VT-Developmental Neuroscience (Kent Keyser)
CMB 765-VT-Cell Matrix Interactions in Disease (Anne Woods)

Cell and Molecular Biology - VII Module 4: 3 hrs

CMB 764-VT-Molecular Basis of Disease (Bob Kimberly)
CMB 771-VT- Bacterial Pathogenesis B (David Briles)
CMB 772-VT-Diseases of The Nervous System (Harry Sontheimer)
CMB 774-VT-Stem cell Biology (Tom Ryan)
CMB 775-VT-Lymphocyte Biology (Allen Zajac)
CMB 776-VT-From Molecules to Behavior (Paul Gamlin)
CMB 777-VT-Molec. Recognition & 3-D Graphics (Mark Walter)
CMB 778-VT-Dendritic Cell Biology (Laura Timares)

CMB 779-VT-Genetics of Chronic Inflammatory Disease (Lou Bridges/Laura Hughes)

Biochemistry and Molecular Genetics (BMG)

726. **BMG Seminar**. 1 hour.

734. **Protein Structure**. Emphasis on structural results derived from X-ray crystallographic analyses. Prerequisite: CMB 700:701 and permission of instructor. Spring. (Chattopadhyay)

741. **Advanced Molecular Genetics**. Mechanisms of gene regulation and rearrangement in bacteria, yeast, and higher eukaryotes. Prerequisite: CMB 700-701 and permission of instructor. Fall. (Higgins)

742. **Biophysical Aspects of Molecular Structure and Function**. Major modern biophysical methods used in the elucidation of the structure-function relationship of biologically important macromolecules. Prerequisite: CMB 700-701 and permission of instructor. Fall. (Elgavish)

744. **Protein Spectrometry**. Prerequisite: Permission of instructor. Spring. (Barnes)

751. **Advanced Virology**. Advanced studies of selected aspects of virology. Prerequisite: CMB 702 or permission of the instructor. (Broker, Chow)

753. **Protein Crystallography**. Theoretical and experimental aspects of protein crystallography. Applications of X-ray diffraction techniques to studying three-dimensional structures of proteins. Prerequisite: CMB 700-701 or permission of instructor. Fall. (Smith)

757. **Physical Biochemistry**. Physical methods for investigating structures of biological molecules. Prerequisite: Calculus and physical chemistry and permission of instructor. Spring.

760. **Nuclear Magnetic Resonance**. Fall. (Krishna)

761. **Advanced Eukaryotic Molecular Biology**. Spring. (Townes)

762. **Human Biochemistry and Genetics**. General mammalian biochemistry. For medical students and graduate students only. Prerequisite: Permission of instructor. Fall. 7 hours. (Townes)

771. **Dental Biochemistry**. Survey of human biochemistry, emphasis on areas of interest to dentists. For dental students only. Prerequisite: Permission of instructor. Fall. 9 hours. (Pritchard)

773. **Journal Club in Stem Cell Biology**. Fall, Spring. 1 hour. (Ryan)

774. **Cell Signaling Journal Club**. Fall, Spring. 1 hour. (Thompson)

775. **Special Topics in Biochemistry**. 2 hours.

776-780. **Special Topics in Biochemistry**. 1-5 hours.

781-785. **Advanced Special Topics**. 1-5 hours.

791. **Journal Club in Gene Therapy**. Fall, Spring. 1 hour. (Strong)

795. **Journal Club in Molecular Biology**. Fall, Spring, Summer. 1 hour. (Higgins)

796. **Journal Club in Advanced Eukaryotic Molecular Biology**. Fall, Spring. 1 hour. (Townes)

798. **Doctoral-Level Nondissertation Research**. 1-14 hours.

799. **Doctoral-Level Dissertation Research. Prerequisite: Admission to candidacy**. 1-14 hours.

Cell Biology (Ph.D.)

Degree Offered:	Ph.D.
Director:	Dr. James F. Collawn
Phone:	(205) 934-1002
E-mail:	**jcollawn@uab.edu**
Web site:	**www.uab.edu/cellbio**

Faculty

Anupam Agarwal, Professor (Medicine); Regulation of heme oxygenase gene expression in kidney and vascular injury

Namasivayam Ambalavanan, Assistant Professor (Pediatrics);

Daniel Balkovetz, Associate Professor (Medicine), Epithelial Cell Biology; Epithelial Cell Cycle Regulation; Regulation of paracellular transport across epithelial cell tight junctions

Zsuzsanna Bebok, Assistant Professor, Membrane protein biogenesis in epithelial cells (CFTR as model). Unfolded protein response.

David M. Bedwell, Professor (Microbiology); Mitochondrial Biogenesis, ABC Transporters

Dale J. Benos, Professor and Chair (Physiology & Biophysics); Molecular physiology of ion channels

Etty N. Benveniste, Professor and Chair (Cell Biology); Neuroimmunology, Cytokine Production in the Central Nervous System

Michael J. Bertram, Assistant Professor (Medicine)

J. Edwin Blalock, Professor (Physiology & Biophysics); Molecular Recognition, Immune Network, Immune Neuroendocrine Interactions

Daniel Bullard, Associate Professor (Comparative Medicine); Adhesion Molecules in Inflammatory Disease

Steven L. Carroll, Associate Professor (Clinical Pathology); The Role of Neuregulin-1 in PNS Regeneration and Neoplasia

Chenbei Chang, Assistant Professor (Cell Biology); Developmental Biology, Signal Transduction and Transcriptional Control in Early Frog Embryogenesis

Igor Chesnokov, Assistant Professor (Biochemistry & Molecular Genetics); DNA Replication and Cell Cycle in Eukaryotes

James F. Collawn, Professor (Cell Biology); Molecular Mechanisms of Protein Trafficking

Rita Cowell, Assistant Professor, (Psychiatry); Transcriptional Regulation of Early Postnatal Brain Development: Insights into the Pathology of Autism and Schizophrenia

David Crawford, Assistant Professor (Pediatrics); The Role of G2/M-Specific Genes in Mitosis and G2 DNA Damage Checkpoint Regulation

Christine A. Curcio, Professor (Ophthalmology); Relations of Human Retinal Anatomy and Spatial Vision

Stuart J. Frank, Professor (Medicine); Growth Hormone Receptor Structure-Function, Growth Hormone Signaling

Andra Frost, Associate Professor (Pathology); Fibroblast-Epithelial Cell Interactions and Developmental Pathways in Breast Cancer

W. Timothy Garvey, Professor (Nutrition Sciences); Molecular, Metabolic, and Genetic basis of type 2 diabetes mellitus, insulin resistance, and obesity.

G. Yancey Gillespie, Professor (Surgery); Cell and Molecular Biology of Malignant Brain Tumors

Candece Gladson, Professor (Clinical Pathology); Angiogenesis and Cellular Signals in Glioma Tumors that Promote Proliferation and Invasion

Lisa Guay-Woodford, Professor (Medicine); Characterizing molecular determinants involved PKD pathogenesis

James Hagood, Associate Professor (Pediatrics); Role of Fibroblasts in Tissue Remodeling

Kai Jiao, Assistant Professor (Genetics) TGF-beta/Bmp signaling during cardiogenesis

Richard Jope, Professor (Psychiatry); Neuronal Signaling Mechanisms Regulating Gene Expression and Cell Death

F. Cleveland Kinney, Professor (Medicine); Research for medications for the treatment of dementia and Alzheimer's disease.

Robert Kimberly, Professor (Medicine); Autoimmunity, Molecular Mechanisms and Genetic Risk

Jeffrey Kudlow, Professor (Medicine); Transcriptional Control of Growth Factor Gene Expression

Matthieu Lesort, Assistant Professor (Behavioral Neurobiology)

Fang-Tsyr (Fannie) Lin, Assistant Professor (Cell Biology); Regulation of Cell Growth by G Protein-Coupled Receptor Signaling

Weei-Chin Lin, Assistant Professor (Cell Biology); Cell Cycle Control and DNA Damage Response

Akhil Maheshwari, Assistant Professor (Pediatrics); The role of IL-8 in the development of the human small intestine and the mechanism of cytomegalovirus-induced inflammation in human intestinal mucosa.

Mary MacDougall, Associate Dean for Research (Dental School), Molecular Mechanisms associated with tooth formation, tissue-specific cytodifferentation, extracellular matrix formation, tooth regeneration and related human genetic dental diseases.

Richard B. Marchase, Professor/Assoc Dean Medicine (Cell Biology); Cytoplasmic Glycosylation and Intracellular Calcium Regulation

James Markert, Professor (Neurosurgery); Surgical care of brain tumor patients, novel therapies in the treatment of brain tumors, gamma knife, clinical trials.

Guillermo Marques, Assistant Professor (Cell Biology); Developmental and adult synaptic plasticity, regulation of gene expression during nervous system development, cell signaling and signal transduction by the TGF-ß/BMP pathway in neurons.

Jay McDonald, Professor and Chair (Pathology); Cellular Life and Death Signals in Cancer, Aids and Bone Disease

Michael Miller, Assistant Professor (Cell Biology); Function and evolution of intercellular communication mechanisms

Casey Morrow, Professor (Cell Biology); HIV Replication. RNA:RNA and RNA:Protein Interactions

Joanne E. Murphy-Ullrich, Professor (Pathology); Extracellular Matrix Control of Cell and Growth Factor Function

Louis Burt Nabors, Associate Professor (Neurology)

Jacqueline Parker, Assistant Professor (Pediatrics); Evaluation of fusogenic HSV for therapy of neuroblastoma

Emma Perez-Costas, Assistant Professor (Psychiarty); Pathogenesis of dopaminergic systems in schizophrenia

Martin M. Pike, Associate Professor (Cardiovascular Disease); Nuclear Magnetic Resonance Studies of Myocardial Ion Regulation

Lucas D. Pozzo-Miller, Assistant Professor (Neurobiology); Neurotrophins on Ca2+ Signaling, Synapse Development, and Plasticity

Mark Prichard, Associate Professor (Pediatrics)

Lawrence Prince, Assistant Professor (Pediatrics); Cystic fibrosis

J. Michael Moates, Assistant Professor (Medicine); Regulation of gene expression in pancreatic islets and adipose tissue.

Gavin Rumbaugh, Assistant Professor (Neurobiology); Molecular Mechanisms of Learning and Memory

Julian C. Rayner, Assistant Professor (Medicine); Cell Biology of the Malaria Parasite, Plasmodium Falciparum

Rosalinda Roberts, Professor (Psychiatry and Behavioral Neurobiology);

Kevin Roth, Professor (Pathology); Molecular Regulation of Neuronal Cell Death

Michael J. Ruppert, Associate Professor (Medicine); Role of Zinc Finger Transcription Factors in Tumor Progression

Susan Ruppert, Assoicate Professor (Biochemistry); Role of Zinc Finger Transcription Factors in Tumor Progression

Erik Schwiebert, Associate Professor (Physiology & Biophysics); Extracellular Nucleotide Signaling and Epithelial Cell Biology and Physiology

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

Bingdong "Ben" Sha, Associate Professor (Cell Biology); Protein Crystallography

Gene P. Siegal, Professor (Pathology); Tumor Cell Interaction with Extracellular Matrix During Invasion

Brian Sims, Assistant Professor (Pediatrics);

Harald W. Sontheimer, Professor (Neurobiology); Regulation and Function of Ion Channels in Glia

David Standaert, Professor (Neurology); Translational Research in Neurodegenerative Diseases

Elizabeth S. Sztul, Professor (Cell Biology); Intracellular Membrane Sorting and Fusion

W. Anne B. Theibert, Associate Professor (Neurobiology); Inositol-Phosphate Second Messengers in Neurotransmitter Action in the Brain

Laura Timares, Assistant Professor (Dermatology); Engineering Dendritic Cells for Immunotherapy

Jacques Wadiche, Assistant Professor (Neurobiology); Synaptic transmission and glutamate transporters.

Linda Wadiche, Assistant Professor (Neurobiology); The function of adult generated neurons

Shu-Zhen Wang, Associate Professor (Opthalmology); Molecular mechanism of early retinal development, using the embryonic chick as a model system to answer questions with molecular biology, cell biology, genetics, and experimental embryology

Danny Welch, Professor (Pathology); Molecular Basis of Tumor Progression and Metastasis

Anne C. Woods, Professor (Cell Biology); Cell-Extracellular Matrix Interactions and Transmembrane Signaling

J. Michael Wyss, Professor (Cell Biology); Neural Control of Cardiovascular System and Limbic Cortex

Bradley K. Yoder, Associate Professor (Cell Biology); Polycystic Kidney Disease

Jianhua Zhang, Assistant Professor (Pathology); Mechanisms of neuron cell death, epilepsy, Parkinson's disease, autophagy, glutamate receptor activation, signaling transcription regulation

Tong Zhou, **Associate** Professor (Medicine); Apoptosis in Autoimmunity and Cancer Biology

Program Information

The Department of Cell Biology participates in the Cellular and Molecular Biology (CMB) Program and the Neurosciences Program, which are designed to provide a first-year curriculum to graduate students interested in the broad area of cellular and molecular biology. The CMB and Neurosciences Programs involves student recruitment, admissions, and the first-year curriculum. At the end of the first year, each CMB student chooses a mentor and elects to pursue a degree in biochemistry and molecular genetics, cell biology, microbiology, or neurobiology. Students from the Medical Scientist Training Program (MSTP) are also welcome to complete the basic science component of their training in Cell Biology.

The goal of the graduate program in Cell Biology (CB) is to prepare research-oriented individuals for careers as independent academic or industrial scientists. Each student is counseled and guided by faculty and staff and interacts with a variety of postdoctoral fellows and other graduate students. Thus, through both formal and informal discussion, the student is challenged to consider a wide range of scientific questions and methodologies and is encouraged to relate these to the particular scientific endeavor he or she is pursuing.

The student is expected to gain a broad research background through active participation in formal courses and through hands-on research. In addition to the research-oriented course offerings within the department, the student is expected to expand his or her knowledge by undertaking relevant coursework in biochemistry, statistics, physiology, molecular biology, and immunology. Each student's program is tailored to meet the student's needs and scientific interests. A student usually rotates through at least three independent laboratories (10 weeks each) before identifying a permanent laboratory where his or her formal research for the Ph.D. degree will be done. The Ph.D. program, including coursework, research, and

dissertation, usually requires a commitment of at least four to five years, depending on the background of the student.

The program allows specialization in all areas of cell biology, including neurobiology. The program houses active, well-funded research projects that are indicated in the preceding faculty roster. In addition to UAB Graduate School admission requirements, the program requires a baccalaureate degree with a major emphasis in science, a B average in all courses and a slightly higher average in science coursework, and a minimum score of 1,100 on combined verbal and quantitative sections of the GRE General Test.

Ph.D. Program

Although it is expected that most students will enter the program with an advanced biological science background, exceptionally promising students with deficiencies in biological studies will be accepted into the program with the proviso that they take the necessary remedial coursework, usually while they simultaneously pursue research within the program. The successful student will, by the end of his or her graduate tenure, have an ability both to carry out independent research and to contribute to a teaching program in modern cell biology.

Following completion of basic coursework (usually one-and-a-half to two years), each student is required to pass a qualifying examination. This examination is structured to (1) test the student's ability to design a comprehensive research proposal that addresses a problem within an area of cell biology, (2) determine the breadth of the student's knowledge in modern biological sciences, and (3) examine the student's understanding of current concepts in cell biology. After successful completion of this examination by a graduate faculty committee, the student is admitted to candidacy.

All entering graduate students will be awarded fellowships plus full payment of tuition, fees, and insurance premiums. No teaching responsibilities are attendant to the fellowship acceptance.

Additional Information

Deadline for Entry Term(s):	Apply to Cellular and Molecular Program or Contact Cell Biology Program Director

Contact Information

For detailed information, contact Dr. James F. Collawn, UAB Cell Biology Graduate Program Director, MCLM 350, 1530 3rd Avenue South, Birmingham, AL 35294-0005.

Telephone 205-975-7145

E-mail **jcollawn@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.

Cell Biology (CB)

601. **Dental Gross Anatomy**. 8 hours.

712. **Developmental Biology**. Journal club. 1 hour. Pass/Fail. (Miller)

713. **Growth Factors**. Journal club. 1 hour. Pass/Fail. (Gillespie)

714. **Calcium Signaling**. Journal club. 1 hour. Pass/Fail. (Chatham)

716. **Molecular Basis of Signaling in the Nervous System**. Journal club. 1 hour. Pass/Fail. (Theibert/Fuller)

720. **Developmental Neurobiology**. Journal club. 1 hour. Pass/Fail. (Wyss)

721. **Laboratory Rotation**. 5 hours. Pass/Fail.

722. **Vascular Biology**. Journal club. 1 hour. Pass/Fail. (Wyss)

724. **Special Topics in Cell Biology**.

728. **Advanced Cell Biology**. (Collawn)

729. **Mechanisms of Signal Transduction**. (Theibert)

730. **Molecular Basis of Conformational Diseases**. (Sztul/Wyss).

735. **Mechanisms of Writing a Scientific Paper and NIH Grant**. (Morrow)

746. **Cell Cycle and Cancer Genetics**. (Chen)

737. **Developmental Biology**. (Chang)

740. **Research in Cell Biology**. 1 hour. Pass/Fail.

747. **Cell Biology Seminar**. 1 hour. Pass/Fail. (Yoder)

748. **Special Problems in Cell Biology**. 1-5 hours.

750. **Graduate Gross Anatomy**. Lectures, demonstrations, and dissection of all systems and regions of human body. 6 hours. (M. Casey)

752. **Graduate Histology**. Light microscopic features and ultrastructure of cells, fundamental tissues, and organ systems. 5 hours. (Fraser-Cotlin)

755. **Graduate Neuroanatomy**. Gross and microscopic preparations of brain and spinal cord. Functional significance of tracts and nuclei. 4 hours. (Wyss)

779. **Special Problems in Neuroanatomy**. 1-4 hours.

788. **Directed Readings**. Specialized advanced readings in selected topics under direction of appropriate faculty member. 1-4 hours.

790. **Developmental Neurobiology**. (Wyss) 4 hours.

798. **Doctoral Nondissertation Research**. 1-15 hours.

799. **Doctoral Dissertation Research**. Prerequisite: Admission to candidacy. 1-15 hours.

Cellular and Molecular Biology (Ph.D.)

Degree Offered:	Ph.D. (participating departments)
Director:	Dr. Harald Sontheimer
Phone:	(205) 975-5805
E-mail:	**cmb@uab.edu**
Web site:	**www.cmb.uab.edu**

Faculty

Cell Adhesion and Matrix

Steve Barnes, Professor (Pharmacology); Bile Acids and Isoflavonoids

Candece Gladson, Professor (Pathology); Malignant Astrocytoma Cell Migration, Invasion, and Proliferation

Richard Mayne, Professor (Cell Biology); Development and Structure of Mesenchymal Tissues

Anne Woods, Professor (Cell Biology); Transmembrane Signaling in Cell-matrix Interactions

Cell Physiology and Signaling

Daniel Balkovetz, Associate Professor (Medicine); Epithelial Cell Biology and HIV-Associated Nephropathy

Zsuzsanna Bebok, Research Assistant Professor (Cell Biology); Membrane Protein Biogenesis in Epithelial Cells (CFTR as model), Unfolded Protein Response

Dale Benos, Professor and Chairman (Physiology & Biophysics); Molecular basis of operation on ion channels and transporters

Etty Benveniste, Professor and Chairman (Cell Biology); Communication Between the Immune and Nervous Systems

J. Edwin Blalock, Professor (Physiology & Biophysics); Immune, Neuroendocrine Interactions, Molecular Recognition

Chenbei Chang, Assistant Professor (Cell Biology); Signal pathways in frog development

John Chatham, Associate Professor (Medicine); Cardiomyocyte Function and Metabolism in Diabetes and Ischemic Heart Disease

James Collawn, Associate Professor (Cell Biology); Intracellular Protein Sorting

Stuart Frank, Professor (Medicine); Eukaryotic Cell Biology and Genetics

James Hagood, Associate Professor (Pediatrics); Fibroblast Signaling in Lung Remodeling and Fibrogenesis

Richard Jope, Professor (Psychiatry); Neuronal Signaling Systems, and Neuronal Disorders

Natalia Kedishvili, Assistant Professor (Biochemistry and Molecular Genetics); Regulation of Retinoic Acid Homeostasis

Kevin Kirk, Professor (Physiology & Biophysics); Ion Channels, Membrane Traffic, Cystic Fibrosis

Fang-Tsyr (Fannie)Lin, Assistant Professor (Cell Biology); Regulation of Cell Growth by G Protein-Coupled Receptor Signaling

Richard Marchase, Senior Associate Dean for Biomedical Research, Vice President of Research, Professor (Cell Biology); Calcium Signaling and Cardiac Hypertrophy

Guillermo Marques, Assistant Professor (Cell Biology); Developmental Synaptic Plasticity, Regulation of Gene Expression during Nervous System Development, Cell Signaling and Signal Transduction

Michael Miller, Assistant Professor (Cell Biology); Function and Evolution of Intercellular Communication Mechanisms

Joanne Murphy-Ullrich, Professor (Pathology); Extracellular Matrix Control of Cell and Growth Factor Function

Julian Rayner, Assistant Professor (Medicine); Cell Biology of the Malaria Parasite, plasmodium falciparum

Erik Schwiebert, Associate Professor (Physiology & Biophysics); Extracellular Nucleotide Signaling and Epithelial Cell Biology and Physiology

Lisa Schwiebert, Associate Professor (Physiology & Biophysics); Airway Inflammation

Elizabeth Sztul, Professor (Cell Biology); Organellar Biogenesis and Membrane Traffic

John Thompson, Professor (Surgery); Molecular Mechanisms of Angiogenesis

Danny Welch, Professor (Pathology); Molecular Basis of Tumor Progression and Metastasis

Anne Woods, Professor (Cell Biology); Syndecan Proteoglycans in Cell Adhesion and Matrix Assembly

Gene Regulation and Expression

Anupam Agarwal, Professor (Medicine); Regulation of Heme Oxygenase Gene Expression in Kidney and Vascular Injury

Ching-Yi Chen, Assistant Professor (Biochemistry & Molecular Genetics); Mechanism and Regulation of Mammalian mRNA Turnover

Xinbin Chen, Professor (Cell Biology);The p53 Tumor Suppressor Gene Family and Transcriptional Regulation

David Crawford, Assistant Professor (Pediatrics); Control of Mitotic Entry and the G2 DNA Damage Checkpoint, Ubiquitin Mediated Protein Degradation

N. Patrick Higgins, Professor (Biochemistry and Molecular Genetics); Mechanics and Enzymology of in vivo Chromosome Movement

Weei-Chin Lin, Assistant Professor (Medicine); Cell cycle control and DNA damage response

Susan Lobo-Ruppert, Assistant Professor (Medicine); Synthesis of Small Nuclear RNAs

Jay McDonald, Professor and Chairman (Pathology); Cellular Life and Death Signals in Cancer, AIDS and Bone Disease

Kevin Roth, Professor (Pathology); Molecular Regulation of Neuronal Cell Death

Thomas Ryan, Assistant Professor (Biochemistry and Molecular Genetics); Gene Regulation, Stem Cells, Mouse Models, Mutagenesis, Cell Therapies

Tim Townes, Professor and Chairman (Biochemistry and Molecular Genetics); Developmental Regulation of Gene Expression

Charles Turnbough, Professor (Microbiology); Bacterial Gene Regulation; Structure/Function of the Bacillus anthracis Spore Surface

Hengbin Wang, Assistant Professor (Biochemistry and Molecular Genetics); Rose of Histone Modification in Chromatin Function

Immunology

Prescott Atkinson, Associate Professor (Pediatrics); Signal Transduction in Lymphocytes

Scott Barnum, Professor (Microbiology); Role of Complementin CNS Inflammatory Diseases

Olalee Branch, Assistant Professor (Medicine); Malaria, Molecular Epidemiology and Immunology

Louis Bridges, Associate Professor (Medicine); Immunoglobulin Gene Expression; Rheumatoid Arthritis

R. Pat Bucy, Professor (Pathology); Immune Regulation, Transplantation, and HIV Pathogenesis

Peter Burrows, Professor (Microbiology); B Cells, Developmentally Regulated Genes, Isotype Switching

Robert Carter, Associate Professor (Medicine); Molecular Mechanisms of Control of B Lymphocyte Responses

David Chaplin, Professor and Chair man (Microbiology); T Cell Control of Tissue Inflammation, Regulation of Normal and Pathologic Immune Responses in Lymphoid Tissues. Regulation of Secondary Lymphoid Tissue Development and Function.

Max Cooper, Professor (Medicine); Immune System Ontogeny and Phylogeny

Randall Davis, Assistant Professor (Medicine); Lymphocyte Development and Mechanisms of Lymphomagenesis

Charles Elson, Professor (Medicine); Chronic Intestinal Inflammation

Kohtaro Fujihashi, Professor (Pediatric Dentistry); Mucosal Immunology, Regulation of S-IgA Antibody Responses, Mucosal Vaccine Development

Vithal Ghanta, Professor (Biology); Tumor Immunology, Immune System and Aging, CNS Immune System Interactions

Zdenek Hel, Assistant Professor (Pathology); Development and Testing of Novel HIV/AIDS Vaccine Strategies

Louis Justement, Professor (Microbiology); Lymphocyte Activation, Tyrosine Kinases and Phosphatases, CD45, CD22

Janusz Kabarowski, Assistant Professor (Microbiology); Lysophospholipid receptors in the regulation of innate immunity and inflammation

Judith Kapp, Professor (Ophthalmology); Immune Regulation and Transplantation

Jannet Katz, Professor (Pediatric Dentistry); Vaccine Delivery Systems; Inflammation; Innate Immunity

John Kearney, Professor (Microbiology); B Cells, Idiotypes, Hybridomas, Transgenic Mice, Immunoregulation

Christopher Klug, Assistant Professor (Microbiology); Hematopoietic Stem Cell Development

William Koopman, Distinguished Professor (Medicine); Pathogenesis of Immune Disease

Hiromi Kubagawa, Research Professor (Pathology); B Cells; Antibodies; Fc Receptors; Immunoglobulin-like Receptors; Immunopathology

Olaf Kutsch, Assistant Professor (Medicine); HIV-1 Latency; HIV-1 Drug Screening

Robinna Lorenz, Associate Professor (Pathology); Cellular and Molecular Immunology of the Gastrointestinal Tract

Jiri Mestecky, Professor (Microbiology); Mucosal Immunity, Vaccines

Sue Michalek, Professor (Microbiology); Vaccine Delivery Systems, Mucosal Immunity, Inflammation, T Cells and Cytokines

Richard Morrison, Professor (Medicine); Immunobiology of Chlamydia Infection

John Mountz, Professor (Medicine); Autoimmunity, Soluble fas; Transgenic Mice

Chander Raman, Assistant Professor (Medicine); Immunology and Rheumatology

Harry Schroeder, Professor (Medicine); Developmental Genetics, Clinical Immunology

Alexander Szalai, Associate Professor (Medicine); Inflammation, Innate Immunity, and the Acute Phase Proteins in Health and Disease

Laura Timares, Assistant Professor (Medicine); Engineering Dendritic Cells for Immunotherapy

Casey Weaver, Professor (Pathology); T Cell Development

Zhixin Zhang, Assistant Professor (Medicine); Molecular Regulation of Early B Cell Development and Antibody Repertoire Formation

Tong Zhou, Associate Professor (Medicine); Apoptosis, Autoimmunity, and Cancer Biology

Macromolecular Structure and Function

Christie Brouillette, Research Professor (Vision Sciences); Protein Structural Cooperativity and Energetics

Debasish Chattopadhyay, Assistant Professor (Medicine); Cellular Trafficking, Antimicrobial Chemotherapy

Herbert Cheung, Professor (Biochemistry and Molecular Genetics); Molecular Motors, and Fluorescence Spectroscopy

Lawrence DeLucas, Professor (Optometry); Protein Crystallography/ Protein Crystal Growth

Terje Dokland, Associate Professor (Microbiology); Cryo-electron Microscopy and X-ray Crystallography of Virus Assembly Processes

Gabriel Elgavish, Professor (Biochemistry and Molecular Genetics); NMR Studies of Intact Hearts

N. Rama Krishna, Professor (Biochemistry and Molecular Genetics); Structural Biology and Biomolecular NMR Spectroscopy

Ming Luo, Professor (Microbiology); Structure-Based Approaches to Anti-Infectious Agents

Sthanam Narayana, Associate Professor (Optometry); Bacterial Surface Protein Anchoring

Jere Segrest , Professor (Medicine); Plasma Lipoprotein Structure and Function

Bingdong (Ben) Sha, Associate Professor (Cell Biology); Structure and Function of Molecular Chaperones

Mark Walter, Associate Professor (Microbiology); X-ray Crystallography, Molecular Recognition, Signal Transduction, Cytokine Structure and Function

Molecular Genetics and Disease

David Bedwell, Professor (Microbiology); Translation Termination, Calcium Signaling

Igor Chesnokov, Assistant Professor (Biochemistry & Molecular Genetics); DNA Replication, Cell Cycle, Cytokines

Peter Detloff, Associate Professor (Biochemistry and Molecular Genetics); Mouse Models of Human Genetic Disorders

Kevin Dybvig, Professor (Genetics); Mycoplasmas, DNA Rearrangements

Lisa Guay-Woodford, Professor (Medicine); Molecular Genetic Determinants of Polycystic Kidney Disease

Kai Jiao, Assistant Professor (Genetics); TGF-beta/Bmp Signaling during Cardiogenesis

Richard Kaslow, Professor (Epidemiology); Immunogenetic Determinants in AIDS and Other Infectious and Immune Diseases

Robert Kimberly, Professor (Medicine); Immunologic Diseases and Autoimmunity

Jeffrey Kudlow, Professor (Medicine); Growth Factor Gene Transcription

Elliot Lefkowitz, Associate Professor (Microbiology); Bioinformatics; Microbial Genomics and Evolution

Michael Ruppert, Associate Professor (Medicine); Mechanism of Action of Transforming Oncogenes in GLI and KLF4/GKLF in Carcinoma Genetic Progression

Rosa Serra, Assistant Professor (Cell Biology); The TGF-beta Superfamily in Development and Disease.

Theresa Strong, Associate Professor (Medicine); Gene Therapy for Cancer and Inherited Disease

Bradley Yoder, Associate Professor (Cell Biology); Cilia Assembly, Function, and Polycystic Kidney Disease

Jianhua Zhang, Assistant Professor (Pathology); Mechanisms of Neuron Cell Death, Epilepsy, Parkinson's Disease, Autophagy, Glutamate Receptor Activation, Signaling, Transcription Regulation

Molecular Pathogenesis

William Benjamin, Associate Professor (Pathology); Genetics of Host-Bacterial Relationship

David Briles, Professor (Microbiology); Bacterial Pathogenesis, Virulence, Immunity, Pneumococcus, Tuberculosis

Noel Childers, Professor (Pediatric Dentistry); Oral Immunization, Dental Caries

Susan Hollingshead, Research Associate Professor (Microbiology); Mechanisms of Variation in Microbial Pathogenesis

Moon Nahm, Professor (Pathology); Vaccine, S. pneumoniae, Bacterial Pathogenesis, Immunity

Michael Niederweis, Associate Professor (Microbiology); The Role of Porins in Outer Membrane Permeability and Drug Resistance of Mycobacteria

David Pritchard, Professor (Biochemistry and Molecular Genetics); Molecular Basis for the Pathogenicity of Gram-Positive Bacteria

Adrie Steyn, Assistant Professor (Microbiology); Mechanism of Mycobacterium Tuberculosis virulence

Thomas Unnasch, Professor (Medicine); River Blindness, Evolution; Immunotherapy; Diagnosis.

Ken Waites, Professor (Pathology)**;** Diagnostic microbiology, epidemiology and mechanisms of antimicrobial resistance

Hui Wu, Assistant Professor (Pediatric Dentistry); Bacteria-host Interaction

Janet Yother, Professor (Microbiology); Streptococcus pneumoniae Genetics and Pathogenesis

Neurobiology

Michael Brenner, Associate Professor (Neurobiology); Molecular Neurobiology

Lynn Dobrunz, Assistant Professor (Neurobiology); Synaptic Transmission, Presynaptic Properties of Single Synapses

John Hablitz, Professor (Neurobiology); Cellular Mechanisms of Neurotransmission

Gail Johnson, Professor (Psychiatry); Phosphorylation and Function of Cytoskeletal Proteins

Robin Lester, Associate Professor (Neurobiology); Nicotinic Receptors in the CNS; Neurobiology of Addiction

Lucas Pozzo-Miller, Assistant Professor (Neurobiology); Calcium Signaling; Synaptic Plasticity; Neurotrophic Factors

Douglas Ruden, Associate Professor (Environmental Health Sciences);Drosophila: Gene Environment Interactions and Toxicology

Harald Sontheimer, Professor (Neurobiology); Role of Neuroglia in Brain Function

J. David Sweatt, Professor and Chairman (Neurobiology); Signal Transduction Mechanisms in Learning and Memory

Anne Theibert, Associate Professor (Neurobiology) ; Role of Phosphoinositides in Developmental Neurobiology

Scott Wilson, Assistant Professor (Neurobiology): Mouse Models of Neurodegeneration

Michael Wyss, Professor (Cell Biology); Control of the Autonomic Nervous System

Yi. Zhou , Assistant Professor (Neurobiology); Modulation of Ion Channels, Regulation of Neuronal Excitability and Synaptic Transmission .

Virology

William Britt, Professor (Pediatrics); Herpesvirus Envelope Assembly

Louise Chow, Professor (Biochemistry and Molecular Genetics); Molecular and Cellular Biology of Human Papillomaviruses

Beatrice Hahn, Professor (Medicine); Human Retroviruses and Associated Diseases

John Kappes, Associate Professor (Medicine); HIV, Molecular Virology and Pathogenesis

Olaf Kutsch, Assistant Professor (Medicine); HIV-1 Latency, HIV-1 Drug Screening

Casey Morrow, Professor (Cell Biology); Viral Morphogenesis and Replication; Gene Therapy and Vaccines

Peter Prevelige, Professor (Microbiology); Viral Capsid Self-Assembly: Defining the Underlying Subunit-Subunit Interactions and Their Potential as Therapeutic Targets

George Shaw, Professor (Medicine); Human Retroviruses, Molecular Virology and Pathogenesis

Wayne Sullender, Professor (Pediatrics); Respiratory Syncytial Virus; Antigenic Diversity

Sunnie Thompson, Assistant Professor (Microbiology); Translation Initiation and Replications of RNA Viruses

Richard Whitley, Professor (Pediatrics); Virus, Herpesvirus, Herpes Simplex, Varicella zoster Virus

Allan Zajac, Assistant Professor (Microbiology); Antiviral Immunity; T Cell Responses

Program Information

Graduate study in the multidisciplinary area of cellular and molecular biology is coordinated through the Cellular and Molecular Biology (CMB) Program. Faculty mentors in this program have primary or secondary appointments in the Departments of Biochemistry and Molecular Genetics, Cell Biology, Microbiology, or Neurobiology. The students enrolled in this program, therefore, have over 140 potential research laboratories in which to pursue their doctoral training.

The CMB Program administers an intensive, year-long core curriculum designed to provide entering graduate students with a comprehensive introduction to the broad fields of cellular and molecular biology. The core curriculum includes courses in biomolecules, genetics, cells, signaling, virology and immunology, and special topics. In addition, students are exposed to on-going research projects as they rotate through three different laboratories during their first nine months of residency.

Students enter the CMB Program with the intent of using their classroom and laboratory experiences during the first year to help them further define their research interests. The minimum admission criteria are those of the Graduate School (B-level scholarship and a combined score of 1100 on the verbal and quantitative sections of the GRE General Test) and a suitable background in the biological and physical sciences. Students for whom English is a second language are also required to take the TOEFL examination. At the end of their first year in graduate school, CMB students who successfully complete the first-year curriculum select an advisor and become affiliated with the graduate program of one of the four participating departments.

Advanced courses in CMB are then offered by the four individual departments. The CMB Program, therefore, acts as a mechanism for allowing students to be admitted into graduate school in this general area while maintaining as broad a spectrum of potential research mentors as possible. The program is highly interdisciplinary, and students benefit from the strong interrelationships between the basic science departments and between the basic and clinical sciences. This interdisciplinary approach and the ready willingness to work together to share ideas and methodologies have played a major role in UAB's rise to international prominence in many fields of research. Such interactions also allow graduate research experiences to move at a pace and in directions that might not be anticipated at the outset of thesis work. The program anticipates admitting 25-30 students each year.

Additional Information

Deadline for Entry Term(s):	Fall
Deadline for All Application Materials to be in the Graduate School Office:	[None]
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL also required for international applicants whose native

	language is not English.)

Contact Information

For detailed information, contact Valerie Webster , Program Administrator (International applicants) or Katie Goodson, Program Coordinator (domestic applicants), Cellular and Molecular Biology Graduate Program, SHEL 120, 1530 3rd Avenue South, Birmingham, AL 35294-2182 .

Telephone 1-800-262-7764

Fax 205-975-2536

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

Web **www.cmb.uab.edu**

Course Descriptions

Cellular and Molecular Biology (CMB)

712 **Methods and Logic**. Practical aspects of critical evaluation of the scientific literature. 1 hour.

713 **CMB I**. Biomolecules—Structural and biochemical properties of proteins, enzymes, and coenzymes are discussed. 4 hours.

720 **CMB II.** Genes —Prokaryotic and eukaryotic genetics; control of gene expression; DNA recombination, replication, transcription and translation. 4 hours.

730 **CMB III.** Cells—Fundamental aspects of cell biology. 3 hours.

741 **Module 1 CMB-IV** Bacterial Genetics & Physiology. 3 hours.

742 **Module 1 CMB-IV** Cell Signaling. 3 hours

754 **Module 2 CMB-V** Cell. & Molec. Neurosci.-This course will cover fundamental principles of cellular neurobiology, including membrane permeability, the ionic basis of the resting membrane potential and of the action potential, neurotransmitter substances and their receptors, synaptic transmission and plasticity and their role in learning and memory, intracellular signaling, and the role of glial cells in neuronal function. The course will have 4 days of lectures per week (Mon - Thu) and a journal club-style discussion of a research paper every Friday. Lecturers are faculty members of the Departments of Neurobiology, Cell Biology, and Physiology & Biophysics. Successful completion will depend on the grade in 1 final exam (essay-style), class participation (i.e. on Friday's article discussion), and attendance. 3 hours

755 **Module 2 CMB-V** Cell & Molec. Aspects of Dev. Bio. 3 hours

756 **Module 2 CMB-V** Virology--The format of the course begins with an initial week of lectures to give a background in the subject and then on most following days there will be an hour of lecture followed by an hour of discussion on relevant current issues relating to the topic in order to bring out important concepts. 3 hours

743 **Module 2 CMB-V** Molecular Enzymology--To integrate practical aspects of enzymology and kinetic theories to provide a mechanistic overview of enzyme activity and regulation. 3 hours

761 **Module 3 CMB-VI** Eukaryotic Genetics. 3 hours.

762 **Module 3 CMB-VI** Immunology-- Immunology is a team-taught survey course that covers basic concepts of innate and adaptive immunity. Students actively participate in the course through weekly presentations of selected immunology topics based on the current literature. This course provides an excellent foundation in immunology not only for the budding immunologist, but those in microbiology, medicine, neuroscience and other disciplines. 3 hours

763 **Module 3 CMB-VI** Developmental Neuroscience. 3 hours

765 **Module 3 CMB-VI** Cell Matrix Interactions in Disease --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.

764 **Module 4 CMB-VII** Molecular Basis of Disease—This course comprehensively reviews the discovery and cellular/molecular biology of members of several important gene families and discusses how this knowledge is applied in animal model systems, including the human. An important course theme involves the interdependence and interchangeability of information at the levels of molecules, models, and man. Students will learn to critically analyze and present data obtained from experimental, scientific, and translational papers. 3 hours

771 **Module 4 CMB-VII** Bacterial Pathogenesis--The course in Bacterial Pathogenesis to be taught each year during fourth CMB module has been designed to be relatively comprehensive and will use as its texts both Bacterial Pathogenesis (second edition) by Salyers and DeWhitt and Principals of Bacterial Pathogenesis edited by Eduardo Groisman. The first six two hour lectures and the last lecture will be based loosely on the introductory 8 chapters of Slayers and Dewitt's book. The sixth lecture will be based in part on the chapter by Howard Ochman on evolution of bacterial pathogenesis in Groisman's book. The remaining 13 two hour lectures will cover individual pathogens and will be built around chapters in both books and information developed by the speakers. 3 hours

772 **Module 4 CMB-VII** Diseases of The Nervous System--Major advances have been made in understanding diseases of the nervous system at a cellular and molecular level. Several new findings have had direct therapeutic implications and have resulted in the development of novel drugs or new disease management strategies. This course intends to review the most common brain and CNS disorders. 3 hours

774 **Module 4 CMB-VII** 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. 3 hours

775 **Module 4 CMB-VII** Lymphocyte Biology--The objective of this class is to provide first year graduate students with the opportunity to gain a more in depth understanding of selected aspects of lymphocyte biology. Tentative topics to be cover 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. 3 hours

776 **Module 4 CMB-VII** From Molecules to Behavior. 3 hours

777 **Module 4 CMB-VII** Molec. Recognition & 3-D Graphics--Macromolecular interactions (protein-protein, protein-DNA, and protein-drug) are critical for life and impact every area of science. This class will review the basic principles of protein-protein interactions and provide the student practical experience studying these interactions using 3D graphics. The class will spend approximately equal time reviewing papers and learning to use molecular graphics programs. 3 hours

778 **Module 4 CMB VII** Dendritic Cell Biology. 3 hours – This course will cover the historical perspective as well as our current understanding of these "professional" antigen presenting cells of the immune system. General principles of dendritic cell function, molecular basis of antigen processing and antigen presentation to T cells, phenotypic and functional subsets, tolerance induction and use in immunotherapy will be covered. The course will provide both formal lectures by the instructor and Journal Club-style presentations of key historical and current literature by the students. Students will be evaluated based upon the quality of their journal article presentations, participation in class discussions, quizzes, and attendance.

779 **Module 4 CMB VII** Genetics of Chronic Inflammatory Disease. 3 hours --Chronic inflammatory diseases (such as rheumatoid arthritis, systemic lupus erythematosus, inflammatory bowel disease, and multiple sclerosis) are thought to be cause by a combination of environmental and genetic factors. This course intends to review the genetic influences on common chronic inflammatory diseases of humans.

780 **Laboratory Rotation.** 2 hours

780 **Laboratory Rotation**. 3 hours

12-week rotations in each of three laboratories conducting research; 15-minute oral presentations on accomplishments following each rotation

Special Courses: 1hr

790 Laboratory Methods

Cellular and Molecular Physiology (Ph.D.)

Degree Offered:	Ph.D.
Director:	Dr. Peter R. Smith
Phone:	(205) 934-4170
E-mail:	**prsmith@uab.edu**
Associate Director:	Dr. Shawn Galin
Phone:	(205) 934-6687
E-mail:	**galin@uab.edu**
Web site:	**grad-program.physiology.uab.edu**

Primary Faculty

Marcas M. Bamman, Associate Professor (Physiology and Biophysics); Plasticity of Skeletal Muscle in Aging and Altered Loading States

Susan L. Bellis, Associate Professor (Physiology and Biophysics); Structure and Function of Integrin Adhesion Receptors

Dale J. Benos, Professor and Chair (Physiology and Biophysics); Molecular Physiology of Ion Channels

Mark O. Bevensee, Assistant Professor (Physiology and Biophysics); Cellular and Molecular Physiology of Acid Base Transport and pH Regulation

Carmel McNicholas-Bevensee, Instructor (Physiology and Biophysics); Structure-Function and Regulation of Ion Channels of the Renal and Cardiovascular System

Kathleen H. Berecek, Professor (Physiology and Biophysics); Hypertension and Cardiovascular Remodeling

J. Edwin Blalock, Professor (Physiology and Biophysics); Neuroimmunoendocrinology

James K. Bubien, Associate Professor (Physiology and Biophysics); The Ionic Permeabilites of Human Lymphocytes.

Catherine M. Fuller, Associate Professor (Physiology and Biophysics); The Molecular Mechanisms Underlying the Function of Epithelial Na^+ and Cl^- Channels

F. Shawn Galin, Assistant Professor (Physiology and Biophysics); Neuroimmunology

Ahsan Husain, Professor (Physiology and Biophysics); Heart Failure Research

Patricia Jackson, Instructor (Physiology and Biophysics); The Connection of Molecular Structure to the Biological and Physiological Aspects of Systems

Kevin L. Kirk, Professor (Physiology and Biophysics); Regulation of the Cystic Fibrosis Gene Product;

Lori L. McMahon, Associate Professor (Physiology and Biophysics); Neuronal Inhibition and Synaptic Plasticity in Hippocampus

Roger M. Rick, Professor (Physiology and Biophysics); Electron Microprobe Analysis of Transepithelial Ion Transport

James A. Schafer, Professor Emeritus (Physiology and Biophysics); Regulation of Epithelial Transport Processes

Lisa M. Schwiebert, Associate Professor (Physiology and Biophysics) Mechanisms of Lung Immunity

Peter R. Smith, Associate Professor (Physiology and Biophysics); The Role of the Membrane Cytoskeleton in Regulating the Cell Surface Expression of Epithelial Transport Proteins

Qin Wang, Assistant Professor (Physiology and Biophysics); GPCR Cellular Trafficking and Signaling and In Vivo Functions

Wei Wang, Instructor (Physiology and Biophysics); Structure and Function of Ion Channels

Douglas A. Weigent, Professor (Physiology and Biophysics); Immunoendocrinology

Secondary Faculty

David Bedwell, Professor (Microbiology)

Etty Benveniste, Professor and Chair (Cell Biology)

Bakhrom Berdiev, Assistant Professor (Cell Biology)

Richard Blackwell, Professor (OB/GYN)

John C. Chatham, Associate Professor (Cardiology)

Debashish Chattopadhyay, Assistant Professor (Medicine)

Irshad Chaudry, Professor (Surgery)

David Curiel, Professor (Medicine)

Louis Dell-Italia, Professor (Medicine-Cardiology)

Lawrence DeLucas, Professor (Center for Biophysical Sci. & Engineering)

Lynn E. Dobrunz, Assistant Professor (Neurobiology)

Stuart Frank, Professor (Neurobiology)

Barbara Gower, Associate Professor (Nutrition Sciences)

John Hablitz, Professor (Neurobiology)

Robert Hardy, Associate Professor (Pathology)

Raymond Ideker, Professor (Medicine-Cardiology)

James E. Johnson, Professor (Medicine)

Kent Keyser, Professor (Vision Sciences)

Peter King, Professor (Neurology)

Jack R. Lancaster, Professor (Anesthesiology)

Robin Lester, Associate Professor (Neurobiology)

James Markert, Professor (Neurosurgery)

Sadis Matalon, Professor (Anesthesiology)

Joseph Messina, Associate Professor (Pathology)

Anthony Nicholas, Assistant Professor (Neurology)

Suzanne Oparil, Professor (Medicine-Hypertension)

Dale Parks, Professor (Anesthesiology)

Andrew Paterson, Assistant Professor (Medicine – Endocrinology)

Joseph Philips, III, Professor (Pediatrics)

Lucas Pozzo-Miller, Associate Professor (Neurobiology)

Steven M. Rowe, Assistant Professor (Medicine- Pulmonary/Allergy/Critical Care)

Gavin Raumbaugh, Assistant Professor (Neurobiology)

Paul W. Sanders, Professor (Medicine)

Harald Sontheimer, Professor (Neurobiology)

Eric Sorscher, Professor and Director (Medicine and CF Center)

J. David Sweatt, Professor and Chair (Neurobiology)

Elizabeth S. Sztul, Professor (Cell Biology)

Anne Theibert, Associate Professor (Neurobiology)

Ferdinand Urthaler, Professor (Medicine-Cardiology)

Mark R. Walter, Associate Professor (Microbiology)

David Warnock, Professor (Medicine-Nephrology)

C. Roger White, Associate Professor (Medicine-Cardiology)

Philip A. Wood, Professor (Genetics)

Program Information

Program Objective

The objective of the Cellular and Molecular Physiology graduate program is to develop in doctoral candidates a fundamental knowledge of mammalian physiology, the ability to conduct research, a capacity to assess work in the field critically, and the ability to teach physiology.

Admission Requirements

Applicants interested in the Cellular and Molecular Physiology Graduate Program apply for admission through the Integrated Biomedical Sciences (IBS) Program (**www.ibs.uab.edu**). Applications to the IBS program are reviwed by the IBS graduate admissions committee. Under special circumstances, applicants will be considered for direct admission into the Cellular and Molecular Physiology Graduate Program. Applications will be judged by the graduate committee of the Cellular and Molecular Physiology Graduate Program, in consultation with other appropriate faculty. Acceptance recommendations will be based on Graduate School admission criteria and, when possible, a personal interview with members of the graduate committee.

Selection of Faculty Advisor and Area of Research

By the end of the first year, the student is expected to have selected an area of research and a permanent advisor from the Physiology and Biophysics' faculty roster. During the second year, the student should assemble his/her thesis committee. The committee will consist of a minimum of five faculty members to include three physiology faculty and two external faculty (at least one external member should be neither a primary nor secondary Physiology and Biophysics' faculty appointment); the department chair and graduate program director are ex-officio members of all graduate thesis committees. The student's committee is required to meet formally with the student every 9-12 months and submit a written report summarizing the deliberations of that meeting to the Director of Graduate Students with a copy to the

student. After 4 years in the program, the Committee will meet every 6 months until the Ph.D. dissertation work is completed.

Financial Assistance

Doctoral students will receive financial aid in the form of a fellowship. Current stipends are $23,000 per year plus tuition, fees and insurance.

Ph.D. Program Requirements

Courses

All students are required to take IBS 700, 701, 702, and a biostatistics course. Each student is also required to take three reading courses (PHY 790, 791, 792), PHY 796 (Seminars in Physiology) and PHY 751 (Student Seminars). PHY 796 and PHY 751 must be taken by all students throughout their graduate studies. All 1st year students must successfully complete GRD 717 “Principles of Scientific Integrity” or PHY 792 (Ethics in Scientific Publication) to fulfill the ethics requirements. PHY 792 is offered durring the Summer Semester . Exceptions and substitutions must be approved by the program director and/or department chair. The graduate school regularly offers one-day workshops and short courses in scientific writing, communication skills, and scientific ethics that our graduate students are encouraged to attend. Full-time students are required to register for 15 hours per semester for fall and spring; 10 hours for summer semester.

Grades

At the completion of a course, students are normally assigned a Letter Grade. Students must maintain a “B” average. If a student receives one “C” grade or lower, the student will be placed on academic probation. In general, it takes two semesters to clear probation. If a student receives two “C” grades or lower in required courses, the student is subject to dismissal from the program pending an appeal to the Cellular and Molecular Physiology Graduate Committee.

Departmental Seminars

As required for PHY 796, all graduate students must attend and participate in the department seminar series every semester that they are enrolled. Following each seminar, the graduate students meet with the seminar speaker over lunches for which they have previously registered with the program manager. Attendance is mandatory. As the seminar program is published well in advance, students should ensure that they are available for this 2-hour period. The faculty consider the seminar series as one of the more important and essential enrichment activities for the graduate students.

Grievances

Although rare, disagreements can arise that may affect a student’s progress toward the completion of the degree. The parties involved in such a dispute should make a good faith effort to discuss and resolve the disagreement. Guidelines regarding the handling of

grievances as well as arbitration for the graduate program in Cellular and Molecular Physiology are available on our web site at **grad-program.physiology.uab.edu**. If, for any reason, you have concerns or a grievance about the program, please contact Dr. Peter Smith, Dr. Shawn Galin, or Dr. Dale Benos directly.

Admission to Candidacy

Following completion of required courses, each student must take a qualifying exam, subject to review by the student's thesis committee. This qualifying exam should be completed during the student's third year. Specifically, this exam will entail a written thesis proposal and an oral defense of this proposal. Throughout the organization of the thesis proposal-qualifying exam, the amount of direction the student receives is at the discretion of the mentor and the thesis committee members. The thesis proposal should be 10-pages in length and written in an NRSA-style format (i.e. Abstract, Specific Aims, Background and Significance, Preliminary Data, and Research Design). A draft of the proposal should then be handed out to each committee member, the student may then schedule the oral defense of the proposal before the department; it is anticipated that approval of the written proposal by the committee members will occur within a month of having received the proposal. Following the oral defense of the thesis proposal, the committee may recommend corrections to the written proposal within a month of the defense. Upon successful completion of both the written proposal and oral defense, the student may apply for candidacy. It is recommended that no more than 2 months lapse between initial submission of the written proposal to the committee and application for candidacy; if more than two months elapses, the student may have to re-defend the proposal.

Upon entering candidacy, each student must enroll in PHY 799 (Doctoral Level Dissertation Research). Completion of 30 credit hours (i.e., 2 semesters @ 15 hours each) of PHY 799 is required prior to the thesis defense.

Ph.D. Program Completion

Once the mentor, student, and thesis committee agree that the student has completed his/her thesis work, the student may begin to prepare for the thesis defense. In preparation for and completion of the defense, the following steps must be taken:

The student must 'apply for the degree'. This entails completing the necessary paperwork (See Kathy McConnell, MCLM 701, 934-3951), which requires signatures from the student's mentor and the graduate program director.

After the student has applied for the degree, he/she will receive the following items from the UAB Graduate School: thesis formatting instructions, typed signature forms (see Julie Bryant-HUC 511), microfiche form, and graduate student survey. For any questions regarding formatting, the student should contact Jan Baird at the Graduate School (HUC 511, 975-6511). Upon receipt of the typed signature forms, the student should bring these forms to the graduate program director's office for safekeeping until the defense. The student should complete the microfiche form and survey at his/her convenience.

Once the thesis is complete, copies of the thesis must be distributed to each thesis committee member, as well as to Dr. Benos, the graduate program director and the program manager. All copies must be distributed AT LEAST TWO WEEKS PRIOR TO THE ORAL DEFENSE.

To schedule the oral defense of the thesis, the student must contact Kathy McConnell (934-3951). She will need the title of the thesis, the date and time agreed upon by the mentor and thesis committee, and the location of the defense. It is the responsibility of the student to reserve a site for the defense and a location to meet with the committee after the defense.

Upon successful defense of the thesis, the student must turn in a final, corrected draft to the UAB Graduate School with 10 business days following the oral defense. Since the Graduate School may require formatting changes to the thesis after the final draft has been submitted, it is strongly suggested that the student remain at UAB at least two additional weeks to complete these changes.

Before the student leaves the Cellular and Molecular Physiology Graduate Program, the student must leave a forwarding address with the graduate program director's office.

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**.

Additional Information

Deadline for Entry Term(s):	Fall
Deadline for All Application Materials to be in the Graduate School Office:	[None]
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 Peter Smith, Graduate Program Director, UAB Department of Cellular and Molecular Physiology, McCallum Building, Room 701, 1530 3rd Ave South, Birmingham, AL 35294-0005.

Telephone 205-934-4170

Fax 205-996-2280

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

Web **www.physiology.uab.edu**

Required Courses

Pathology

IBS 700	IBS I–Biochemistry & Cell Physiology 8 hrs
IBS 701	IBS II–Pathophys & Pharmac of Disease 8 hrs
IBS 702	IBS III–Functional Genomics 8 hrs

Cellular and Molecular Physiology (PHY)

PHY 698	Master's Nonthesis Research 1-13 hrs
PHY 699	Master's Thesis Research 1-15 hrs
PHY 702	Physiology of Optometry Students (spring) 6 hrs
PHY 703	Physiology of Dental Students (spring) 6 hrs
PHY 790-794	Selected Topics in Physiology 3 hrs
PHY 796	Seminars in Physiology 2 hrs
PHY 751	Student Seminars in Physiology (summer) 2 hrs
PHY 798	Nondissertation Research 1-13 hrs
PHY 799	Doctoral Level Dissertation Research 1-15 hrs (Prerequisite: Admission to Candidacy)

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.

Cellular and Molecular Physiology (PHY)

698. **Master's Nonthesis Research**. 1-10 hours per term.

699. **Master's Thesis Research**. Prerequisite: Admission to candidacy. 1-10 hours per term.

702. **Physiology for Optometry Students**. General principles of organ system physiology. 6 hours.

703. **Physiology for Dental Students**. General principles of organ system physiology. 6 hours.

751. **Summer Seminars**. Manditory participation. 1 hour per summer semester.

790-794. **Selected Topics in Physiology**. Literature search, seminars, discussion of research in various areas of physiology. 1-4 hours each.

796. **Seminars in Physiology**. Departmental Seminars.

798. **Doctoral Nondissertation Research**. 1-15 hours per term.

799. **Doctoral Dissertation Research**. Prerequisite: Admission to candidacy. 1-15 hours per term.

Genetics (Ph.D.)

Degree Offered:	Ph.D.
Director:	Dr. Ada Elgavish
Phone:	(205) 934-6547
E-mail:	**aelgavis@uab.edu**
Web site:	**http://138.26.45.17/education/graduate/IGGP/index.htm**

Interdisciplinary Genetics Graduate Program (IGGP) Faculty

Allison, David, Ph.D., Department of Biostatistics
Obesity, quantitative genetics, clinical trials, and statistical and research methodology

Arnett, Donna, Ph.D., M.S.P.H., Department of Epidemiology
Genetic Epidemiology, Pharmacogenetics

Beasley, Mark, Ph.D., Department of Biostatistics
Methodological problems in statistical genetics and bioinformatics

Bedwell, David, Ph.D., Department of Microbiology
Translation termination, mRNA turnover

Benos, Dale, Ph.D., Dept of Physiology and Biophysics
Molecular mechanisms of ion transport

Bevensee, Mark , Ph.D., Dept of Physiology and Biophysics
Molecular mechanisms of ion transport

Blume, Scott, MD, Department of Medicine
Naturally occurring genetic variations and mutations in malignant cells

Briles, David, Ph.D., Department of Microbiology
Microbial Genetics
Brown, Elizabeth , Ph.D., M.P.H., Department of Epidemiology
Immunogenetics of autoimmune disease, infectious disease and virally-associated cancers

Burrows, Peter, Ph.D., Department of Microbiology
Development of B lymphocytes

Carroll, Steven, M.D., Ph.D., Department of Pathology
Molecular mechanisms of NF1-associated nerve-sheath tumors

Cui, Xianggin , Ph.D., Department of Biostatistics
Splicing array design ; Equivalence tests for large dimension data produced by microarrays

Dumanski, Jan, Ph.D., Department of Genetics
Cancer genetics, Array-based analyses in Medical Research and Diagnostics

Dybvig, Kevin, Ph.D., Department of Genetics
Molecular Biology and Genetics of Mycoplasmal Diseases

Fernandez, Jose , Ph.D., Department of Nutrition Sciences
Identification of genes contributing to racial differences in obesity, diabetes, and cancer: the genetic admixture approach

Gao, Guimin , Ph.D., Department of Biostatistics
Fine mapping of Quantitative Trait Loci (QTL) and complex disease genes in pedigrees, via joint linkage disequilibrium (LD) and linkage analysis with the variance component method; Developing fine mapping software for different population structures

Go, Rodney, Ph.D., Department of Epidemiology
Population Genetics

Guay-Woodford, Lisa, M.D., Depts of Medicine and Pediatrics
Molecular genetic determinants of polycystic kidney disease

Hartman, John, Department of Genetics
Genetic Buffering of DNA Replication

Higgins, Patrick, Dept of Biochemistry and Molecular Genetics
Gene transposition; Supercoiling and DNA Structure

Jiao, Kai, M.D., Ph.D., Department of Genetics
TGF-beta/Bmp signaling during cardiogenesis

Kaslow, Richard, M.D., Department of Epidemiology
Immunogenetics

Kesterson, Robert, A., Ph.D., Department of Genetics
Hypothalamic control of feeding behavior

Kimberly, Robert, M.D., Medicine: Clin. Immun& Rheumatology
Various forms of connective tissue disease, i.e. rheumatoid arthritis, systemic lupus erythematosus, scleroderma, dermatomyositis, polymyositis, and vasculitis (Wegener's granulomatosis, etc), fibromyalgia, and osteoporosis

Klug, Christopher, Ph.D., Department of Microbiology
Hematopoietic stem cell development

Korf, Bruce, M.D., Ph.D., Department of Genetics
Neurofibromatosis Type 1

Lefkowitz, Elliott, J., Ph.D, Department of Microbiology
Genetic Bioinformatics

Li, Ling, D.V.M., M.S., Ph.D., Department of Medicine
Connections between cardiovascular disease and Alzheimer’s disease (AD) using molecular, cellular, and transgenic animal technologies

Loraine, Ann, Ph.D., Department of Genetics
Genome-based methods for analysis and interpretation of expression microarrays

Marqués, Guillermo, Ph.D., Department of Cell Biology
Developmental and adult synaptic plasticity, regulation of gene expression during nervous system development, cell signaling and signal transduction by the TGF-ß/BMP pathway in neurons

Marron, Michele,Ph.D., Department of Pediatrics
Role of MHC class I molecules and CD8 T cells in pathogenesis of type 1 diabetes

McKinney, Brett, Ph.D., Department of Genetics
Immunogenetics, Bioinformatics, Systems Biology

Messiaen, Ludwine, Ph.D., Department of Genetics
Molecular genetics testing in hereditary disorders

Messina, Joseph, Ph.D., Department of Pathology
Insulin and growth hormone resistance

Page, Grier , Ph.D., Department of Biostatistics
Techniques for quality control, meta analysis, integrating and data mining of microarray, proteomics, metabolic, linkage, association and other genomics data; Bioinformatics tools for the analysis of microarray data

Percy, Alan, M.D., Department of Pediatrics
Rett Syndrome

Roth, Kevin, M.D., Ph.D., Department of Pathology
Neurodegenerative disease models

Schroeder, Harry, M.D., Ph.D., Department of Medicine
Immunology that focuses on the genetics of immune diseases — specifically, genetic conditions that lead to increased susceptibility to infection

Shrestha, Sadeep, Ph.D., Department of Epidemiology
The interplay of human genetics with behavioral and environmental factors in the natural history and pathogenesis of infectious diseases

Sorscher, Eric , M.D., Department of Medicine
Cystic Fibrosis and Molecular Genetics

Standaert, David, M.D., Ph.D., Department of Neurology
Role of genetics in the pathogenesis of neurodegenerative diseases

Steyn, Adrie, Ph.D, Department of Microbiology
Bacterial genetics

Strong, Theresa, Ph.D., Department of Medicine
Gene Therapy and Cancer and Inherited Disease

Sweatt, David, Ph.D., Department of Neurobiology
Genomic targets of learning and memory; Epigenetic mechanisms; Genetic disorders associated with cognitive dysfunction

Tang, Jianming, "James", Ph.D., Department of Medicine
Genetic and epigenetic influences on infection and immunity in human populations

Tanik, Murat , Ph.D, Dept. of Electrical & Computer Engineering
Integrated Systems Design

Thompson, Sunnie, Ph.D., Department of Microbiology
Yeast genetics used to dissect the mechanism of translation initiation

Tiwari, Hemant , Ph.D., Department of Biostatistics
Genetic linkage analysis; Disequilibrium mapping; Population genetics; Molecular evolution; Bioinformatics; Genetics of infectious diseases

Wilson, Scott, Ph.D., Department of Neurobiology
Mouse models of neurodegeneration

Wood, Philip, A., D.V.M., Ph.D., Department of Genetics
Genetics of fatty acid oxidation diseases

Wyss, J.M., Ph.D., Department of Cell Biology
Role of neuregulin as a neuronal proliferation and differentiation factor in normal and transgenic mice; Effect of phytoestrogens on learning and memory and neuronal function

Yi, Nengjun , Ph.D., Department of Biostatistics
Statistical and computational methods for identifying multiple interacting genes for complex traits

Yoder, Brad, Ph.D., Cell Biology
Pathogenesis of polycystic kidney disease

Yother, Janet, Ph.D., Department of Microbiology
Bacterial genetics

Zhang, Jianhua, Ph.D., Department of Pathology
Genetic models of epilepsy and neurodegenerative diseases

Zhang, Kui , Ph.D., Department of Biostatistics
Development of methodology for linkage, disequilibrium, and haplotype analysis; Microarray analysis

Program Information

The main goal of the **UAB Interdisciplinary Genetics Graduate Program (IGGP)** is to provide students interested in genetics with an excellent, flexible didactic experience and a large pool of mentors with expertise in a wide variety of areas of genetics, to prepare them for independent and innovative careers in research and training. The Program emphasizes a broad approach to the fundamental principles of genetics, development and molecular biology combined with extensive research training.

The Program is based on close day-to-day interaction between students and faculty, both in the classroom and the laboratory. The research interests of our faculty span the fields of

genetics, cell biology, molecular and developmental biology. Modern molecular approaches are used to study gene structure, expression and function in diverse experimental systems from humans and mice to bacteria. The IGGP is also designed to permit close interaction between graduate students, postdoctoral fellows and faculty, while also encouraging full participation in the larger community of biological scientists at UAB.

For details about the program, please visit our website at:
http://138.26.45.17/education/graduate/IGGP/index.htm

Additional Information

Deadline for Entry Term(s):	Fall
Deadline for All Application Materials to be in the Graduate School Office:	April 1
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	**http://main.uab.edu/show.asp?durki=56104**

For details information, please contact Dr. Ada Elgavish, IGGP Executive Director, Shelby Building, room 178G, University of Alabama at Birmingham, Birmingham, AL 35294-2182.

Telephone 205-934-6547

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

Web site: **http://138.26.45.17/education/graduate/IGGP/index.htm**

Course Descriptions

A few examples of the **courses available** in the Department of Genetics are given below.

Genetics (MGE)

MGE 709: **Human Genetics.** Course master: Dr. Bruce Korf (8 credit hours) The course will provide the student with in-depth knowledge of human genetics and genomics, with an emphasis on problem-solving and approaches to the study of human disease

MGE 750: **Chromosome Structure, Dynamics and Abnormalities** Course master: Dr. Fady Mikhail (2 credit hours) The course will provide students with in-depth knowledge of chromosome structure in health and disease.

MGE 702: **Grant Proposal Writing.** Course masters: Dr. Trenton Schoeb (1 credit hour) Students will be taught the main parts of an NIH grant proposal. Writing the respective parts will be assigned as homework. Basic knowledge and experience needed for appropriate selection and use of animals in contemporary biomedical research will also be taught. This will include animal biology, model selection, husbandry standards, disease prevention, technical methods and regulatory requirements for humane use of animals in biomedical

research. Selected faculty members will discuss and analyze with the students success and failure grant application stories.

MGE 701: **Basic Statistics.** Course master: Dr. Ada Elgavish. (3 credit hours) To provide understanding and a working knowledge of the basic approach to the conduct of research. Specifically, the course is designed to familiarize students with data collection and management, computer analysis of data using selected statistical tests.

MGE 780: **Department of Genetics Seminar.** Course master: Dr. Dan Bullard. (1 credit hour) Faculty and students from our department as well as others meet once a week at the Department of Genetics Seminar. This is a forum in which invited speakers from other institutions, as well as our faculty members, postdoctoral fellows and advanced graduate students present and discuss their research.

MGE785: **Department of Genetics Journal Club.** Course master: Dr. Philip A Wood. (1 credit hour). Faculty and students from our department as well as others meet once a week at the Journal Club. This is a forum in which faculty members, postdoctoral fellows as well as graduate students, including first year graduate students, present recent papers on a variety of topics related to genomics.

MGE 798: **Laboratory Rotations**. This is the official course designation for research rotations. Rotations, each 8 weeks long, expose graduate students to research carried out in different laboratories with the objective of learning a variety of approaches and techniques. Rotations have the added advantage of facilitating the choice of a mentor that fits the student's personal goals.

MGE 799. **Doctoral Dissertation Research**. Prerequisite: Admission to candidacy. 1-6 hours.

Integrative Biomedical Sciences (Ph.D.)

(Ph.D. in participating departments)

Degree Offered:	Ph.D. (Participating departments)
Director:	Dr. Coral A. Lamartiniere
Phone:	(205) 934-7139
E-mail:	**coral@uab.edu**
Web site:	**www.ibs.uab.edu**

Faculty from Participating Departments

Environmental Health Sciences **www.soph.uab.edu**

Pathology **www.path.uab.edu**

Pharmacology **www.uab.edu/pharmtox**

Physiology and Biophysics **www.physiology.uab.edu**

Program Information

The Integrative Biomedical Sciences (IBS) Graduate Program, offered through the Departments of Environmental Health Sciences, Pathology, Pharmacology and Toxicology, and Physiology and Biophysics, consists of course work and individual laboratory research leading to a terminal degree (Ph.D.). The IBS Graduate Program is designed to provide interdisciplinary training of high quality to a select group of predoctoral students, preparing them to become independent investigators in the disciplines of cellular, molecular, and organ-based physiology and pathology, complex human diseases, toxicology or disease therapies. Students are immersed in research at the forefront of scientific endeavor and provided with sufficient guidance and course work to place their research in the proper perspective.

The first-year curriculum emphasizes the following three areas: acquisition of a working knowledge of contemporary cellular and molecular biology; an integrated approach toward understanding the principles of physiology, pathology, toxicology, and disease therapy; and the role of genetics and genetic models of disease in basic biology. Involvement in laboratory training through research rotations, and the acquisition of skills in reading, writing, and speaking are also emphasized. Advanced students are engaged primarily in research but also take advanced courses and tutorials in specialized areas of interest as well as participate in seminars. Completion of requirements for the terminal degree usually takes 4 to 6 years. No foreign language is required.

Graduates typically go on to postdoctoral research appointments followed by careers in academic research and teaching or research in the biotechnology industry.

Facilities and Resources

Faculty members participating in the program have more than 100,000 square feet of laboratory space. In addition to well-equipped labs, a number of special facilities are available, including several multiprobe NMR spectrometers, advanced confocal microscopic equipment, state of the art mass spectrometry facilities, electron microscopes, protein and nucleic acid synthesis and analysis instrumentation, bacterial fermentation facilities, X-ray diffraction equipment, a P3 containment laboratory, computer facilities, and a hybridoma facility.

How to Apply

The admission decision is based on scores achieved on the Graduate Records Examinations (GRE; a combined score of 1100, nominally, on the verbal and quantitative portions of the General Test), undergraduate GPA, letters of evaluation, laboratory experience, and, whenever possible, a personal interview with members of the Admissions Committee. There is no application deadline, but all applications received will be reviewed by March 1 of each academic year.

To be accepted into the program, the student should have completed a B.A. or B.S. degree that includes the following undergraduate course work by the time of entrance: calculus, physics, general and organic chemistry, and at least one introductory course in zoology or biology. Courses in physical chemistry, genetics, and cell biology are also to the benefit of the candidate. Any remedial course work must be completed with a grade of “B” or better before the end of the first full year of doctoral studies.

Additional Information

Deadline for Entry Term(s):	Consult Randy L. Seay (205-934-7810; mailto:**rseay@uab.edu**) for information.
Deadline for All Application Materials to be in the Graduate School Office:	Contact Randy L. Seay
Number of Evaluation Forms Required:	Contact Randy L. Seay
Entrance Tests	Contact Randy L. Seay
Comments	None
Graduate Catalog Description	**http://main.uab.edu/show.asp?durki=24905**

For more information, contact Randy L. Seay, Program Manager, VH L108 H, 1530 3rd Avenue South, Birmingham, AL 35294-0019.

Telephone 205-934-7810

Fax 205-934-8240

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

Web **www.ibs.uab.edu**

Microbiology (Ph.D.)

Degree Offered:	Ph.D.
Director:	Dr. Peter Burrows
Phone:	(205) 934-6529
E-mail:	**sirles@uab.edu**
Web site:	**www.microbio.uab.edu**

Faculty

Ronald T. Acton, Professor (Microbiology); Immunogenetics

Prescott Atkinson, Associate Professor (Pediatrics); Primary Immune Deficiencies and the Role of Infection in Asthma and other Chronic Diseases

Daniel F. Balkovetz, Associate Professor (Medicine); Epithelial Cell Biology, Interaction of Bacterial Pathogens with Epithelial Cells

Scott R. Barnum, Professor (Microbiology); Neuroimmonology, Innate Immunity in the CNS Including Complement, Adhesion Molecules, C-reactive Protein, Fc Recptors and gama/delta T cells

David M. Bedwell, Professor (Microbiology); Mechanism of Translation Termination, Treatment of Genetic Diseases Caused by Premature Stop Mutations

William H. Benjamin, Jr. Associate Professor (Pathology); Genetics of Host-Bacterial Relationship

OraLee Branch, Assistant Professor (Medicine): Malaria, Molecular Epidemiology and Immunology

S. Louis Bridges, Associate Professor (Medicine); B Lymphocytes and Immunoglobulin Gene Expression in Rheumatoid Arthritis and Hepatitis C; Pharmacogenetics of Rheumatoid Arthritis

David E. Briles, Professor (Microbiology); Bacterial Pathogenesis, Pneumococcus, Vaccines, Virulence, Immunity

William J. Britt, Professor (Pediatrics); Herpesvirus Envelope Assembly

R. Pat Bucy, Professor (Pathology); T Cell Development, Immune Regulation

Peter D. Burrows, Professor (Microbiology); B Cells, Developmentally Regulated Genes, Isotype Switching

Robert Carter, Associate Professor (Medicine); Molecular Mechanisms of Control of B Lymphocyte Responses

David D. Chaplin, Professor and Chair (Microbiology); Regulation of Secondary Lymphoid Tissue Development and Function

Debasish Chattopadhyay, Assistant Professor (Medicine); Structure-Based Drug Design, Vesicular Trafficking, Structural Biology of Parasites

Noel K. Childers, Professor (Pediatric Dentistry); Mucosal Immunization, Dental Caries

Mashkoor A. Choundhry, Assistant Professor (Surgery); Intestinal Immune and Barrier Functions Following Alcohol Intoxication and Burn Injury

Max D. Cooper, Professor (Medicine); Immune System Ontogeny and Phylogeny

Marilyn J. Crain, Associate Professor (Pediatrics); Pediatric and Perinatal HIV, Molecular Epidemiology of Streptococcus pneumoniae

Randall S. Davis, Assistant Professor (Medicine); Lymphocyte Development, Lymphomagenesis, and Immunologic Disorders of B cells

Terje Dokland, Associate Professor (Microbiology); Structure and Assembly of Viruses and Bacteria Cryo-electron Microscopy

Kevin Dybvig, Professor (Genetics); Mycoplasmas: Genetics, Capsule, Immune Avoidance

Jeffrey C. Edberg, Associate Professor (Medicine); Autoimmunity, Complex Genetic Diseases, Immunoglobulin Receptors, Phagocytes

Charles O. Elson, Professor (Medicine); Regulation of Mucosal Immune Responses, Pathogenesis of Chronic Intestinal Inflammation and Inflammatory Bowel Disease

Kohtaro Fujihashi, Professor (Pediatric Dentistry); Mucosal Immunity & Tolerance, Mucosal Vaccine Development and Mucosal Aging

Patricia N. Fultz, Professor (Microbiology); Retroviral Pathogenesis, HIV Vaccines

James F. George, Associate Professor (Surgery); Transplantation Immunology, Mechanisms of Immunologic Tolerance, Immunologic Mechanisms of Atherosclerosis

Vithal K. Ghanta, Professor (Biology); Tumor Immunology and CNS & immune System Interactions

G. Yancey Gillespie, Professor (Surgery); Malignant Brain Tumors, Cell Biology, Immunobiology, Viral Vector Therapies, Murine Brain Tumor Models

Beatrice H. Hahn, Professor (Medicine); Human Retroviruses and Associated Diseases

Zdenek Hel, Assistant Professor (Pathology); HIV and Cancer Vaccines, Gene Therapy

Susan K. Hollingshead, Professor (Microbiology); Variation Evolution, Virulence, Pathogenesis, Vaccines, Streptococcus pneumoniae

Victoria A. Johnson, Professor (Medicine); HIV Pathogenesis and Drug Development and Resistance, Hepatitis B and C Pathogenesis

Louis B. Justement, Professor (Microbiology); Lymphocyte Activation/Differentiation, T and B Cell Antigen Receptor Signaling, Regulation of Programmed Cell Death

Janusz Kabarowski, Assistant Professor (Microbiology); Lipid Regulation of Inflammation and Immunity in Atherosclerosis

Judith A. Kapp, Professor (Ophthalmology); Immunoregulation by T cells and Transplantation Immunology

John C. Kappes, Associate Professor (Medicine); HIV Molecular Virology and Pathogenesis

Richard A. Kaslow, Professor (Epidemiology); Immunogenetic Determinants in AIDS and Other Infectious and Immune Diseases

John F. Kearney, Professor; (Microbiology); B Cells, Immunology of Anthrax, Transgenic Mice

Robert P. Kimberly, Professor (Medicine); Immunologic Diseases and Autoimmunity

Christopher A. Klug, Associate Professor (Microbiology); Hematopoietic Stem Cell Biology and Leukemia

Hiromi Kubagawa, Research Professor (Pathology); Immunoglobulin-like Molecules and Fc Receptors, Innate Immunity and Immunopathology

Olaf Kutsch, Assistant Professor (Medicine); HIV-1 Latency, HIV-1 Drug Screening

Elliot J. Lefkowitz, Associate Professor (Microbiology); Microbial Genomics, Viral Evolution, Bioinformatics, and Biodefense

Robin G. Lorenz, Associate Professor (Pathology); Mucosal Immunology, Inflammatory Bowel Disease, Helicobacter-Associated Gastritis and Adenocarcinoma

Ming Luo, Professor (Microbiology); Structure-Based Approaches to Anti-Infectious Agents

Michele P. Marron, Assistant Professor (Pediatrics); Type 1 Diabetes, Genetics, Immunology

Jiri Mestecky, Professor (Microbiology); Mucosal Immunity, Vaccines

Suzanne M. Michalek, Professor (Microbiology); Vaccine Delivery Systems, Mucosal Immunity, Inflammation, T Cells and Cytokines, Innate Immune System

Zina Moldoveanu, Research Professor (Microbiology); Mucosal Immunology, Vaccines, HIV

Casey D. Morrow, Professor (Cell Biology); Viral Replication, Vaccines

John D. Mountz, Professor (Medicine); Autoimmunity; Genetics, Arthritis, Apoptosis, Cell Senescence

Moon H. Nahm, Professor (Pathology); Bacterial Vaccines, Antibody Structure and Function, B Cell Development

Michael Niederweis, Associate Professor (Microbiology); Structure and Function of Porins and Other Outer Membrane Proteins of Mycobacterium tuberculosis, Transport Mechanisms Across Membranes, New TB Drugs

Peter E. Prevelige, Professor (Microbiology); Virus Structure and Assembly, HIV Antivirals

David G. Pritchard, Professor (Biochemistry & Molecular Genetics); Baterial Pathogenesis, Streptococci, Anthrax, Polysaccharides, Phage Lysins

Firoz Rahemtulla, Professor (Prosthodontics and Biomaterials); Salivary Peroxidase System, Salivary Glands

Chander Raman, Assistant Professor (Medicine); Autoimmunity and Tolerance, Lymphocyte Activation, Signal Transduction, Lymphocyte Development

Julian C. Rayner, Assistant Professor (Medicine); Biology and Pathogenesis of the Malaria Parasite, Plasmodium falciparum

Harry W. Schroeder, Professor (Medicine); Developmental Genetics, Clinical Immunology

George M. Shaw, Professor (Medicine); Human Retroviruses, HIV Pathogenesis and Immunity

Adrie J. C. Steyn, Assistant Professor (Microbiology); Molecular Mechanism of Mycobacterium tuberculosis Virulence/Domancy; Redox Biology of M. tuberculosis, Protein Networks, Small-Molecule Inhibitors that Disrupt Protein Complexes

Wayne M. Sullender, Professor (Pediatrics); Respiratory Syncytial Virus, Human Metapneumovirus

Jianming Tang, Assistant Professor (Medicine); HIV/AIDS, Genetics, Immunogenetics, Immunology, Infectious Diseases

Sunnie R. Thompson, Assistant Professor (Microbiology): Translation, Molecular Viology

Charles L. Turnbough Jr., Professor (Microbiology); Bacterial Gene Regulation and Structure/Function of the Bacillus anthracis Exosporium

Thomas R. Unnasch, Professor (Medicine); River Blindness: Evolution, Immunotherapy, Diagnosis

Mark R. Walter, Associate Professor (Microbiology); Signal Transduction, Cytokine Structure and Function

Casey T. Weaver, Professor (Pathology); T Cell Development and Cutokine Gene Regulation

Richard J. Whitley, Professor (Pediatrics and Medicine); Herpesviruses

Craig M. Wilson, Professor (Pediatrics Medicine and Epidemiology); HIV in Adolescents, Management and Prevention, HIV in Resource Poor Settings, Global Health Program Development

Janet L. Yother, Professor (Microbiology); Capsular Polysaccaride Genetics, Assembly Mechanisms, and Virulence; Streptococcus pneumoniae Pathogenesis

Allan Zajac, Assistant Professor (Microbiology); Antiviral Immunity, T-Cell Responses

Zhixin (Jason) Zhang, Assistant Professor (Medicine); Molecular Regulation of B Cell Development and Immunoglobulin Gene Recombination

Graduate Program Objectives

The Department of Microbiology participates in the Cellular and Molecular Biology (CMB) graduate program, which is designed to provide a core curriculum to graduate students interested in the broad area of cellular and molecular biology. The CMB program involves student recruitment, admissions, and the first-year curriculum. At the end of the first year, each CMB student chooses a mentor and elects to pursue a degree in biochemistry and molecular genetics, cell biology, microbiology or neurobiology.

The Microbiology graduate program has as its primary objective to provide high quality, multidisciplinary training leading to the Ph.D. degree. Trainees who complete this program are expected to make significant future contributions in research in the basic biomedical sciences and to teach future generations of competent and productive research scientists.

The program consists of a core curriculum that emphasizes (a) the multidisciplinary and quantitative aspects of modern biomedical sciences; (b) a diversity of laboratory research training experiences; and (c) the development of skills in reading, writing, and speaking. Advanced students take courses and tutorials in specialized areas of interest, participate in seminars, and have opportunities to gain teaching experience while satisfying other requirements for their doctoral program.

Areas of specialization for Ph.D. dissertation research include prokaryotic and eukaryotic molecular biology; molecular virology; viral, microbial, and mammalian cell genetics; immunogenetics; cellular, developmental, and molecular immunology; biosynthesis, and structure of biological macromolecules; and host-parasite relationships, pathogenesis, and infectious disease.

Administration of Graduate Program

The Microbiology graduate program is administered by a graduate committee, chaired by the Microbiology graduate program director. The committee consists of six faculty members representing different scientific subdisciplines of microbiology.

Admission Requirements and Financial Aid

The CMB admissions committee considers applications for admission to the Ph.D. program from prospective graduate students who present evidence of superior scholarship and who have completed courses in general and organic chemistry; mathematics, and at least one introductory course in zoology or biology. Completion of courses in physical chemistry and biology, including genetics and biochemistry, is also recommended. Students with M.S., M.D., D.D.S., D.M.D., and D.V.M. degrees are encouraged to apply.

Admission criteria for the Ph.D. program are those of the Graduate School, plus a personal interview. Students accepted into the program during the last several years have had average scores of greater than 600 on the quantitative portion of the GRE General Test and 1,200 on the combined verbal and quantitative sections. All students accepted into the program are provided with fellowships or traineeships. Fellows and trainees are required to undertake full-time studies and are not permitted to do any other remunerative work. Financial support will be continued provided the student's performance is satisfactory. During the 2007 -2008 academic year, entering students are being provided with stipends of $ 23,000 per annum plus funds for tuition, fees, and health insurance. These amounts are reviewed yearly.

Ph.D. Program Requirements

Students entering with B.S. or B.A. degrees normally need five to six years to complete the curriculum. There are no language requirements. Requirements for the Ph.D. degree are as follows:

1. Completion of the following courses or their equivalent: see CMB first year curriculum on the following website: **http://www.cmb.uab.edu/**
2. Completion of at least three advanced courses (700 level) in an area of the student's interest;
3. Attendance and participation in at least one Journal Club and the Development of Communication Skills for Biological Research (MIC 710) during each term of residence after the first year.
4. Satisfactory performance in one preliminary examination in which the student must propose and defend an original research proposition;
5. Admission to candidacy for the Ph.D. degree (upon completion of the above requirements and approval of a dissertation research program by the student's advisor and dissertation committee);
6. A dissertation reporting the results of original, significant, and publishable scientific research;
7. A final oral examination on the dissertation, conducted by the student's dissertation committee; and
8. A formal public seminar presentation of the dissertation research.

Additional Information

Deadline for Entry Term(s):	Variable
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	**http://main.uab.edu/show.asp?durki=24912**

For detailed information, contact Ms. Debbie Sirles, Program Manager, UAB Department of Microbiology, Bevill Biomedical Research Building, Suite 258, 1530 3rd Ave South, Birmingham, AL 35294-2170.

Telephone 205-934-0621

Toll Free 866-642-7764

E-mail: **sirles@uab.edu**

Web **www.microbio.uab.edu**

Course Descriptions

Cellular and Molecular Biology (CMB)

See CMB first year curriculum on the following website: **http://www.cmb.uab.edu/**

Microbiology (MIC)

The following courses may be taken more than once.

710. **Development of Communication Skills for Biological Research**. 2 hours. Fall, spring.

737. **Mucosal Immunology Journal Club**. 1 hour. Fall, spring.

724. **Virology Journal Club**. 1 hour. Fall, spring.

772. **Bacterial Pathogenesis Journal Club**. 1 hour. Fall, spring.

785. **Post-Transcriptional Regulatory Mechanisms**. 1 hour. Fall, spring.

786. **Retrovirology Journal Club**.1 hour. Fall, spring.

789. **Journal Club in Biological Crystallography**. 1 hour. Fall, spring.

796. **Neuroimmunology Journal Club**. 1 hour. Fall, spring.

797. **Cellular and Molecular Immunology Journal Club**. 1 hour. Fall, spring.

798. **Nondissertation Research**. 1-15 hours.

799. **Dissertation Research**. Prerequisite: Admission to candidacy. 1-15 hours.

Neurobiology (Ph.D.)

Degree Offered:	Ph.D.
Director:	Dr. Anne Theibert
Phone:	(205) 934-7278
E-mail:	theibert@nrc.uab.edu
Web site:	www.neurobiology.uab.edu

Primary Faculty

Michael Brenner, Associate Professor; Molecular Control of Transcription in Astrocytes; Protein Aggregate Disease; Spinal Cord Injury

Lynn E. Dobrunz, Assistant Professor; Synaptic Transmission; Presynaptic Properties of Single Synapses

John J. Hablitz, Professor and Vice-Chair of Neurobiology; Development of Ion Channel Gating and Synaptic Transmission by Excitatory Amino Acids in the Mammalian Forebrain

Robin A. J. Lester, Associate Professor; Molecular Pharmacology of Ligand- and Voltage-Gated Ion Channels in the Central Nervous System

Lucas D. Pozzo-Miller, Assistant Professor; Micro-Compartmentalization of Calcium in Synaptic Function and Plasticity; Role of Brain-Derived Neurotrophic Factor

Gavin Rumbaugh, Assistant Professor; Molecular Mechanisms of Synaptic Plasticity with a Focus on Signaling Pathways Downstream of the NMDA Receptor

Harald W. Sontheimer, Professor and Director of the Civitan International Research Center and of the Center for Glial Biology in Medicine; Regulation and Function of Ion Channels in Glia; Pathology of Gliomas

J. David Sweatt, Professor and Chair of Neurobiology and Director of the Evelyn F. McKnight Research Institute; Genetic and Epigenetic Mechanisms Involved in Memory Formation, Disruption of these Processes in Cognitive Disorders

Anne B. Theibert, Associate Professor; Molecular Mechanisms of the PI 3-Kinase Cascade in Neuronal Development

Linda O. Wadiche, Assistant Professor; Maturation of Adult Neural Stem Cells into Functional Neurons; GABAergic Synaptic Transmission

Jacques Wadiche, Assistant Professor; Synaptic Transmission and Neurotransmitter Uptake in the CNS.

Scott M. Wilson, Assistant Professor; The Role of the Ubiquitin-Proteosome Pathway in the Nervous System.

Yi Zhou, Assistant Professor; Modulation of Ion Channels, Regulation of Neuronal Excitability and Synaptic Transmission

Secondary Faculty

Franklin R. Amthor, Professor, Psychology

Monica Beneyto, Assistant Professor, Psychiatry and Behavioral Neurobiology

Dale Benos, Professor and Chair, Physiology & Biophysics

Etty Benveniste, Professor and Chair, Cell Biology

Gautam Bijur, Assistant Professor, Psychiatry and Behavioral Neurobiology

J. Edwin Blalock, Professor, Physiology & Biophysics

William J. Britt, Professor, Pediatrics

Steven L. Carroll, Associate Professor, Pathology

Victor Darley-Usmar, Professor, Pathology

Peter J. Detloff, Associate Professor, Biochemistry and Molecular Genetics

Leon S. Dure, Associate Professor, Pediatrics and Neurology

Candace L. Floyd, Assistant Professor, Physical Medicine and Rehabilitation

Paul D. R. Gamlin, Professor and Chair, Vision Science

Timothy J. Gawne, Associate Professor, Optometry

Candece L. Gladson, Professor, Pathology

Thomas Van Groen, Associate Professor, cell Biology

Gail V. W. Johnson, Professor, Psychiatry and Behavioral Neurobiology

Kent T.Keyser, Professor, Physiological Optics

Kevin L. Kirk, Professor, Physiology & Biophysics

Timothy W. Kraft, Associate Professor, Physiological Optics

Ling Li, Assistant Professor, Medicine

Xiaohua Li, Associate Professor, Psychiatry and Behavioral Neurobiology

Michael S. Loop, Associate Professor, Physiological Optics

Richard B. Marchase, Professor of Cell Biology and Vice President of Research

Guillermo Marques, Assistant Professor, Cell Biology

Robert E. McCullumsmith, Assistant Professor, Psychiatry and Behavioral Neurobiology

Lori L. McMahon, Assistant Professor, Physiology & Biophysics

James Meador-Woodruff, Professor and Chair, Psychiatry

Anthony P. Nicholas, Assistant Professor, Neurology

Alan K. Percy, Professor, Pediatrics and Neurology

Kevin A. Roth, Professor and Director of Neuropathology, Clinical Pathology

Douglas M. Ruden, Professor, Environmental Health Sciences

David G. Standaert, Professor and Director of the Center for Neurodegeneration and Experimental Therapeutics and of the Division of Movement Disorders, Neurology

Qin Wang, Assistant Professor, Physiology and Biophycis

J. Michael Wyss, Professor, Cell Biology

Jianhua Zhang, Assistant Professor, Pathology

Program Information

Objectives

The mission of the Neurobiology Graduate Program is to train a new generation of neuroscientists to become leading contributors in basic and health-related research and instruction. Students receive a breadth of knowledge of the fundamentals of modern neuroscience research, from molecular and cellular to integrative and systems approaches, through course-work, seminars, discussions and hands-on research. Research training involves a focus in a specific area, with topics ranging from understanding the development, structure and function of the normal nervous system to disease mechanisms and treatment. In addition to interfacing with other basic science departments at UAB, students have the opportunity to receive training in clinical topics from Neurology, Neurosurgery, Psychiatry, Pediatrics, and Rehabilitation Medicine. An individual student's program is tailored to meet his/her interests and training needs through instruction and guidance by faculty mentors, and through formal and informal interactions with faculty, research staff, postdoctoral fellows and other graduate students. Thus, the goal of the Neurobiology Graduate Program is to provide students with a firm foundation for fundamental neuroscience research and teaching careers at academic health science centers, research institutions and industry.

Admission Requirements

Most students enter the Neurobiology Graduate Program with an undergraduate background in biology, chemistry, neuroscience, physics, engineering or psychology. The two avenues for entry into the Neurobiology Graduate Program are through a UAB interdisciplinary graduate program or by direct admission. Neurobiology participates in six interdisciplinary graduate programs, including the Cellular and Molecular Biology (CMB) Program, Neuroscience Program, Behavioral Neuroscience (BN) Program, Vision Science (VS) Program, Integrative Biomedical Science (IBS) Program and the Medical Scientist Training Program (MSTP). Each of these interdisciplinary programs provides a specific first-year curriculum and requires students to be involved in laboratory research rotations. At the end of the first year in the interdisciplinary program, a student chooses a mentor and departmental graduate program. Students interested in training in Neurobiology join the Neurobiology Graduate Program at the end of the first year and participate in the program until completion of the Ph.D. Alternatively, students can apply for direct admission to the Neurobiology Graduate Program. Direct applications are reviewed based on Graduate School admissions criteria and, when possible, a personal interview. The requirements and deadlines for the CMB, Neuroscience, BN, VS, IBS and MSTP programs are posted on their websites. The Neurobiology Program considers direct admission applications until the class is filled.

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 $23,000 per year for 2006-2007 entering students.

Overview of the Program

It is expected that most students will complete the entire program in four or five years. In the first year, students participate in the core curriculum that is defined by the interdisciplinary program through which they enter. In addition, each student obtains research experience and identifies potential mentors through three laboratory rotations. At the end of the first year, students choose a mentor and laboratory for their dissertation research. Neurobiology Program students are expected to take a set of courses during the first or second year of the graduate program that provides a fundamental understanding of cellular and molecular neuroscience.

In their second year students conduct laboratory research and participate in the advanced graduate course-Graduate Neuroscience: From Molecules to Mind. This course serves to broaden an understanding of advanced concepts in molecular, cellular, integrative, systems and medical neuroscience; and also serves as the departmental qualifying exam; its content is listed under Course Descriptions below.

The next step for students following completion of the Graduate Neuroscience course is admission to candidacy for the Ph.D., which should occur in the third year. This involves writing a proposal for their dissertation research and successfully presenting it to their graduate committee for approval. In the third and fourth years, students perform dissertation research and may participate in an advanced graduate course such as Biophysics of Membrane Excitability, Neurobiology of Disease, and Synaptic Dynamic. All Neurobiology students attend the Neurobiology Seminar Series and a journal club colloquium throughout their graduate studies. To further develop presentation and teaching skills, students give research seminars in the Neurobiology Student/Fellow Seminar Series and at the Neurobiology Retreat. Students also participate in a teaching practicum that can take the form of didactic lectures, running a journal club, or assisting in a lab course or discussion group.

Additional Information

Deadline for Entry Term(s):	Consult Program Director for information
Deadline for All Application Materials to be in the Graduate School Office:	Deadlines for CMB, Neuroscience, Behavioral Neuroscience, Vision Science, Integrative Biomedical Science, and MSTP interdisciplinary programs are posted on their websites. Deadline for direct admission is June 1 or until the class is filled.
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE or MCAT
Comments	None
Graduate Catalog Description	http://main.uab.edu/show.asp?durki=25095

For detailed information, contact Dr. Anne B. Theibert, Program Director, UAB Department of Neurobiology, SHEL 910, 1825 University Blvd., Birmingham, Alabama 35294-0021.

Telephone (205)934-7278

Fax (205)975-7394

E-mail **theibert@nrc.uab.edu**

Web **www.neurobiology.uab.edu**

Course Descriptions

Neurobiology (NBL)

703. **Neurobiology Seminar**. This weekly research seminar series features prominent outside speakers and UAB faculty. Thursdays at 1, September through May. 1 hour.

711. **Medical Neuroscience**. Introduction to the structure and function of the normal developing and mature nervous system from the molecular level to the behavioral level; provides a basic science introduction to clinical neuroscience. 5 hours.

713. **Graduate Neuroscience: From Molecules to Mind:** This course is required for all Neurobiology graduate students, and serves as their Ph.D. qualifying exam. This course combines lecture material in the Medical Neuroscience course described above with an advanced graduate component of research article presentation and discussion. Five areas are covered: 1-Genesis of the nervous system and its internal environment, 2-Electrical properties of cells in the nervous system, 3-Chemical signaling in the nervous system including synaptic transmission and signal transduction, 4-Information processing and functional circuitry of sensory and motor systems and 5- Higher level processing in the brain –recognition, categorization, learning, memory, reward, motivation and reasoning. 10 hours.

715-718. **Laboratory Rotation I-IV**. Research in neurobiology as applied to specific problems in areas of faculty interest. 1-6 hours.

720. **Biophysics of Membrane Excitability**. Selected topics in ion permeation across biological membranes via ion channels, transporters, and pumps. 4 hours.

729. **Mechanisms of Signal Transduction** (CB 729). Molecular mechanisms involved in transduction of neural signals via cell-surface receptors, targets of intracellular second messengers, and production and outcome of cellular responses. 4 hours.

730. **Neurobiology of Disease**. Investigations into diseases of the nervous system at the cellular and molecular level. 4 hours.

742. **Synaptic Dynamics**. Mechanisms underlying the control of neurotransmitter release, the time course of the synaptic response, and modulation of synaptic signaling. 4 hours.

751. **Cellular and Molecular Neuroscience** (CMB 754/Neur 702). An introduction to the principles of molecular and cellular neurobiology, including the properties of membranes, synaptic transmission, structure and function of ion channels, and mechanisms of neuromodulation. 5 hours.

752. **Developmental Neuroscience** (CMB 763/Neur 720). Birth, migration, growth, and differentiation of neurons; establishment of synaptic connections; regulation and plasticity. 4 hours.

778, 784-788. **Neurobiology Journal Club I-II**. Students, postdoctoral fellows, and faculty critically evaluate recently published work from specific areas of neurobiology. Separate sections focus on autism/developmental disorders (778), ion channels (784), synaptic plasticity (785), signal transduction 786), neurodegenerative diseases 787), and biology of glial cells (788). 1 hour.

798. **Nondissertation Research**. Laboratory research performed prior to admission to candidacy. 1-12 hours.

799. **Dissertation Research**. Prerequisite: Admission to candidacy. 1-12 hours.

Neuroscience Training Program (Ph.D.)

Director:	Dr. Lori McMahon, Associate Professor, Dept of Physiology & Biophysics
Phone:	(205) 934-3523
E-mail:	**mcmahon@uab.edu**
Web site:	**www.neuroscience.uab.edu**

Faculty

Frank R. Amthor, Associate Professor (Psychology); Retinal Physiology, Neural Information Processing

Agnieszka Ardelt, Assistant Professor (Neurology)

Karlene K. Ball, Professor (Psychology); Cognitive Impairment and Aging

Scott R. Barnum, Associate Professor (Microbiology); Role of complement in CNS diseases

Dale J. Benos, Professor and Chair (Physiology & Biophysics); Elucidation of the molecular basis of operation of epithelial and astrocyte ion channels and transporters.

Etty N. Benveniste, Professor and Chair (Cell Biology); Bidirectional Communication Between the Immune and Nervous Systems

Kathleen H. Berecek, Professor (Physiology & Biophysics); Hypertension and Cardiovascular Remodeling

Mark O. Bevensee, Assistant Professor (Physiology & Biophysics); Acid-Base Transport and pH Regulation in the Nervous System

J. Edwin Blalock, Professor (Physiology & Biophysics); delineating certain genetic rules that govern the shape and function of proteins and peptides

Mary M. Boggiano, Associate Professor (Psychology); Neural Control of Feeding

Michael Brenner, Associate Professor (Neurobiology); Molecular Neurobiology

William J. Britt, Professor (Pediatrics); Human Herpesviruses, Molecular Virology and Pathogenesis

Steven L. Carroll, Assistant Professor (Pathology); Neuregulins in Nervous System Regeneration and Neoplasia

Yiu-Fai Chen, Research Professor (Medicine-Cardiovascular Disease); Molecular Mechanisms of Hypoxia-Induced Pulmonary Hypertension

Rita Cowell, Assistant Professor (Psychiatry & Behavioral Neurobiology); Transcriptional Regulation of Early Postnatal Brain Development: Insights into the Pathology of Autism and Schizophrenia

James E. Cox, Associate Professor (Psychology); Physiological Psychology, Obesity

Christine Curcio, Associate Professor (Ophthalmology); Anatomy of Human Retina, Aging

Victor Darley-Usmar, Professor (Pathology); Mechanisms of Cell Signaling by Free Radicals in Physiology and Disease

Peter J. Detloff, Associate Professor (Biochemistry & Molecular Genetics); Mouse Models of Human Genetic Disorders

Allan C. Dobbins, Assistant Professor (Biomedical Engineering); Space and Form in Vision, fMRI

Lynn Dobrunz, Assistant Professor (Neurobiology); synaptic Transmission, Presynaptic Properties of Single Synapses

Leon S. Dure, Professor (Pediatrics & Neurology); Inherited neurologic disease, movement disorders

Paul D.R. Gamlin, Professor and Chair (Physiological Optics); Eye Movements, Central Visual Processing, fMRI

Timothy J. Gawne, Assistant Professor (Physiological Optics); Central Visual Processing, fMRI

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

Yancey G. Gillespie, Professor (Surgery-Neurosurgery); Molecular and Cellular Biology of Malignant Glia

Candece Gladson, Associate Professor (Pathology); Mechanisms Involved in Malignant Astrocytoma Cell Migration, Invasion, and Proliferation

John J. Hablitz, Professor (Neurobiology); Cellular Mechanisms of Neurotransmission

E. Eugenie Hartmann, Professor (Optometry); Early Identification of Vision Problems in Preschool Children

Richard Jope, Professor (Psychiatry-Behavioral Neurobiology); Neuronal Signaling Systems; Mechanisms and Abnormalities in Neuronal Disorders

Robert Kesterson, Assistant Professor (Medicine, Genomics)

Kent T. Keyser, Professor (Physiological Optics); Neurotransmitters and Receptors

Kevin L. Kirk, Professor (Physiology & Biophysics); CFTR Chloride Channel

Bruce Korf, Professor (Genetics) ; Neurogenetics, molecular diagnostics and neurofibromatosis

Timothy W. Kraft, Associate Professor (Physiological Optics); Retinal Photoreceptors and Color Vision

Matthieu Lesort, Assistant Professor (Psychiatry-Behavioral Neurobiology); Metabolism dysfunctions in Huntington's disease

Robin A. J. Lester, Associate Professor (Neurobiology); Nicotinic Receptors in the CNS

Ling Li, Assistant Professor (Medicine); Connections Between Atherosclerosis and Alzheimer Disease

Xiaohua Li, Assistant Professor (Psychiatry-Behavioral Neurobiology)- Mood Disorders, Neuropsychopharmacology and Molecular Neurobiology

Michael S. Loop, Associate Professor (Physiological Optics); Human and Animal Psychophysics, Color Vision

Richard B. Marchase, Professor/Associate Dean of Medicine (Cell Biology); Glucose Metabolism and Cytoplasmic Glycosylation

Guillermo Marques, Assistant Professor (Cell Biology) Developmental and adult synaptic plasticity, regulation of gene expression during nervous system development, cell signaling and signal transduction by the TGF-ß/BMP pathway in neurons

Robert E. McCullumsmith, Assistant Professor (Psychiatry & Behavioral Neurobiology)

Lori L. McMahon, Associate Professor (Physiology & Biophysics), Director, Neuroscience Graduate Program; Hippocampal Neurophysiology and Plasticity

James Meador-Woodruff, Professor (Psychiatry and Behavioral Neurobiology)

Ludwine Messiaen, Professor (Medicine, Clinical Genetics)

Anthony P. Nicholas, Assistant Professor (Neurology); Movement Disorders

Thomas T. Norton, Professor (Physiological Optics); Regulation of Ocular Development

Suzanne Oparil, Professor (Medicine-Cardiovascular Disease); Pathophysiology of High Blood Pressure

Cynthia Owsley, Professor (Ophthalmology), Director, Clinical Research Unit; Vice Chair for Clinical Research; Visual Psychophysics, Aging

Alan K. Percy, Professor (Pediatrics); Inherited Degenerative Diseases, Rett Syndrome, Neonatal Neurology

Steven J. Pittler, Professor (Physiological Optics); Photoreceptor Function in Health and Disease

Lucas Pozzo-Miller, Assistant Professor (Neurobiology); Calcium Signaling; Synaptic Plasticity; Neurotrophic Factors

Alan Randich, Professor (Psychology); Experimental Psychology

Kevin A. Roth, Professor (Pathology), Director of the Comprehensive Neuroscience Center; Regulation of Neuronal Apoptosis

Gavin Rumbaugh, Assistant Professor (Neurobiology) Molecular Mechanisms of Memory Acquisition

Michael E. Sloane, Associate Professor (Psychology); Visual Perception, Psychophysics

Harald Sontheimer, Professor (Neurobiology); The Role Of Neuroglia In Brain Function

David Standaert, Professor (Neurology), Movement disorders

J. David Sweatt, Professor and Chair (Neurobiology); Signal Transduction Mechanisms in Learning and Memory

Elizabeth S. Sztul, Professor (Cell Biology); Membrane Traffic, Protein Degradation

Edward Taub, Professor (Psychology); Biofeedback

Anne B. Theibert, Associate Professor (Neurobiology); Role of Phosphoinositides in Developmental Neurobiology

Donald B. Twieg, Associate Professor (Biomedical Engineering); MRI Technique Development for Functional Brain Imaging

Thomas Van Groen, Associate Professor (Cell Biology); Amyloid angiopathy in cognitive dysfunction and Alzheimer's disease

Jacques Wadiche, Assistant Professor (Neurobiology) Synaptic transmission and glutamate transporters

Linda Overstreet Wadiche, Assistant Professor (Neurobiology) Development of Adult-Generated Neurons

Shu Zhen Wang, Associate Professor (Ophthalmology); Molecular Mechanisms of Early Neural Development

Qin Wang, Assistant Professor (Physiology & Biophysics); reveal novel regulatory pathways controlling GPCR functions at the molecular and cellular levels and to understand how these regulatory mechanisms influence GPCR-elicited physiological functions in vivo, so as to provide new insights for therapeutic strategies

Ray Watts, Professor and Chairman (Neurology); Neurological Movement Disorders: Parkinson's and other clinical disorders of association

Rosalyn E. Weller, Associate Professor (Psychology); Neuroanatomy of the Visual System, fMRI

Scott Wilson, Assistant Professor (Neurobiology); Mouse Models of Neurodegeneration

J. Michael Wyss, Professor (Cell Biology); Control of the Autonomic Nervous System

Jianhua Zhang, Assistant Professor (Pathology); Cell and Molecular Mechanisms of Neurodegeneration

Yi Zhou, Assistant Professor (Neurobiology); Modulation of Ion Channels, Regulation of Neuronal Excitability and Synaptic Transmission

Program Information

Graduate study in the multidisciplinary area of Neuroscience is coordinated through the Neuroscience Graduate Program. Faculty mentors from more than twelve basic and clinical departments participate in this program. The current research of these faculty include molecular, cellular, systems, behavioral, immunological, developmental, neurological, genetic, and psychiatric approaches to the nervous system. With more than sixty participating faculty, students enrolled in the neuroscience graduate program have numerous potential research laboratories in which to pursue their doctoral training. UAB gathers its neuroscientists under the umbrella of the Comprehensive Neuroscience Center (**http://www.cnc.uab.edu/**) whose mission "is to promote and support interdisciplinary neuroscience research, clinical care and education at UAB". Part of the CNC mission is carried out through the Alabama Neuroscience Blueprint Core Center (**http://www.alneurosciencecenter.uab.edu/**), "an NIH funded facility of inter-related research cores designed to facilitate studies of nervous system function and dysfunction through the use of genetically modified rodents and other small laboratory animals" and provide support to the neuroscience community.

The Neuroscience Graduate Program administers an intensive curriculum designed to provide entering graduate students with a comprehensive introduction to Neuroscience and give our advanced students a curriculum and structure for cohesiveness and advancement in their neuroscience career.

The core curriculum includes Biochemistry, Cellular and Molecular Neurobiology, Developmental Neuroscience, and Integrative Neuroscience. Incoming students are first exposed to graduate neuroscience through hands-on experience at the Dauphin Island Sea Laboratory (**www.disl.org**; **http://univ-prog.disl.org/newsite/downloads/bulletin.pdf**) in NEUR 704-Introduction to Neurobiology, which is a 2 ½ week integrated course composed of classroom lectures, experiments, and testing at the Sea Lab. In addition, as part of their core curriculum during their first nine months in the Program, students perform ongoing research projects as they rotate through three different laboratories.

Students enter the Neuroscience Graduate Program with the intent of using their classroom and laboratory experiences during the first year to help them further define their research interests. The minimum admission criteria are those of the Graduate School (B-level

scholarship and a combined score of at least 550 on each section of the GRE), research experience, and a suitable background in the biological and physical sciences. Students for whom English is a second language are also required to take the TOEFL examination. At the beginning of their second year in graduate school, Neuroscience students who successfully complete the neuroscience core curriculum select an advisor and begin their thesis work. Additional coursework includes statistics, ethics, two electives and participation in a journal club and the student summer seminar series.

Students are exposed to the research of outstanding neuroscientists through various on-campus programs sponsored by the Comprehensive Neuroscience Center. These programs include seminar series that bring scientists in from other universities and from UAB, as well as journal clubs and special interest discussion groups that meet weekly.

All students conduct their initial laboratory rotations during the first year and their dissertation research in the laboratories of the various faculty who are members of the Neuroscience Graduate Program. The outstanding facilities for neuroscience research at UAB include state-of-the-art equipment in the laboratories of the faculty members, the Alabama Neuroscience Blueprint Core Center, and unique shared resources such as high-resolution microscopic imaging and high-field MRI systems. Perhaps the greatest strength of graduate training in neuroscience at UAB is the willingness of the faculty to allow students to gain a wide range of expertise and thus greatly facilitate the students' investigation of neuroscience questions of interest to them. The program is designed to recruit and train individuals who will become future leaders in neuroscience research. The program anticipates admitting 6-12 students each year.

Additional Information

Deadline for Entry Term(s):	Fall
Deadline for All Application Materials to be in the Graduate School Office:	January 15th for early admission consideration
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL also required for international applicants whose native language is not English.)
Comments	None
Graduate Catalog Description	**http://main.uab.edu/show.asp?durki=24914**

For detailed information, contact Patricia Matthews, Neuroscience Graduate Program, SHEL 120C, 1825 University Boulevard, Birmingham, AL 35294-2182.

Telephone 205-934-7034.

Fax 205-996-6749.

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

Web **www.neuroscience.uab.edu**

Course Descriptions

Cellular and Molecular Biology (CMB)

(See CMB for complete course description)

700. Cellular and Molecular Biology I. Biochemistry. 4 hours.

Neuroscience (NEUR)

702. **Cellular and Molecular Neurobiology**. Electrical properties of nervous system in currents and channels; synapse, physiology, and pharmacology of neurotransmission; second messenger systems, neuroimmunology, signal transduction. 5 hours.

704. **Introduction to Neurobiology**. Lectures and extensive laboratories introduce students to the neuroanatomy and neurophysiology of marine invertebrates and vertebrates. Course meets in late July – early August at the Dauphin Island Sea Lab in South Alabama. 4 hours.

710. **Integrative Neuroscience.** Sensory systems; motor systems; sensorimotor integration; control of the cardiovascular system; fluid and energy balance, circadian rhythms, learning and memory, genetic bases of behavior. 5 hours.

711. **Principles of Cellular Neuroscience, Module I**. Biochemistry, molecular and cellular biology of neurons and glial cells. Topics on biochemistry and molecular biology will include protein, lipid, carbohydrate and nucleic acid biosynthesis and structure. Next, the cell biology of neurons and glial cells will be introduced, including protein and membrane transport pathways, energy metabolism, protein turnover and gene regulation. Introductory basic concepts of nervous system development will be covered, including the differentiation of neurons and glial cells and the anatomical plan of the brain and spinal cord. Developmental neurobiology concepts are intended to be an introduction to a later graduate-level course taught in the second year. 3 hours.

712. **Principles of Cellular Neuroscience, Module II**. Basic concepts of membrane biophysics, as well as the electrical and chemical signaling within and across neurons. Topics will include the resting membrane potential, passive and active propagation of electrical signals, active electrogenic properties of dendrites and axons, structure and function of voltage-gated and ligand-gated ion channels, and mechanisms of action potential conduction. The molecular and cellular mechanisms of synaptic transmission, the transfer of information between neurons, will then be covered in detail, with topics on mechanisms of synaptic vesicle synthesis and their filling with neurotransmitters, their storage, exocytosis, endocytosis and recycling, the role of neurotransmitter transporters in clearance and termination of neurotransmitter actions, postsynaptic receptors and signal transduction pathways, as well as the dynamic changes in synaptic structure and function. Fundamental basic concepts of neurotransmitter receptor pharmacology will also be presented as the bases for understanding neuropharmacology, the effect of drugs on nerve cell function. 3 hours.

713. **Principles of Cellular Neuroscience, Module III**. Focus will be on the modulation and integration of all the synaptic inputs arriving on neurons. Topics will include temporal and spatial summation of synaptic inputs, metabotropic and neurotrophic factor receptors and their signal transduction mechanisms through second-messenger systems, as well as long-

and short-termsynaptic plasticity, including LTP and LTD as current cellular models of learning and memory. The neurochemical bases of neurological and psychiatric disorders will also be covered. Finally, sensory transduction and motor control systems will be covered as an introduction to a later graduate-level course taught in the second year. 3 hours.

714. **Principles of Cellular Neuroscience, Module IV**. This class will use a journal club format to dissect and discuss primary research literature on topics that parallel the material taught in lectures. Research articles will include groundbreaking seminal papers (“classical”) and modern, state-of-the-art experimental approaches in Neuroscience (“contemporary”). 2 hours.

715-718. **Lab Rotation I-IV**. Techniques of neuroscience as applied to specific problems in areas of faculty interest. pass/fail 1-6 hours each.

720. **Developmental Neuroscience**. Birth, migration, growth and differentiation of neurons; establishment of synoptic connections; regulation and plasticity. 4 hours.

782. **Neuroscience Student Summer Seminar Series**. Students present weekly seminars on their current research to faculty and other students and are evaluated on their presentation by the audience through a prescribed form that is presented to the student at the end of the seminar. 1 hour. Required during entire training period.

Pathology (Ph.D.)

Degree Offered:	Ph.D.
Director:	Scott W. Ballinger, Ph.D.
Phone:	(205) 934-2445
E-mail:	**sballing@uab.edu**
Web site:	**http://peir.path.uab.edu/pathgrad/**

Faculty

Peter G. Anderson, Professor (Pathology and Genomics & Pathobiology); Cardiovascular pathology; education

Scott Ballinger, Associate Professor (Pathology); Cardiovascular disease mediated by free radicals, mitochondrial damage, and dysfunction

William H. Benjamin, Jr., Associate Professor (Pathology) Epidemiology of tuberculosis

R. Pat Bucy, Professor (Pathology); Regulation of in vivo immune responses by T cells

Xu Cao, Professor (Pathology); Multipotent stem cells

Stephen L. Carroll, Associate Professor (Pathology); Neuregulin-1 in PNS Regeneration and Neoplasia

Victor M. Darley-Usmar, Professor (Pathology); Mechanisms of redox signaling in cardiovascular disease

Joanne T. Douglas, Assistant Professor (Pathology); Gene therapy; adenoviral vectors; conditionally replicating adenoviruses

Xu Feng, Associate Professor; Bone Metabolism in RRANKL/RANK signaling in osteoclast differention and function

Andra Frost, Associate Professor (Pathology); Effects of the microenvironment on breast carcinogenesis

Candece L. Gladson, Professor (Pathology); Malignant astrocytoma cell migration

William E. Grizzle, Professor (Pathology); Epithelial cancer

Robert W. Hardy, Associate Professor (Pathology); Insulin resistance; cancer cell proliferation

Zdenek Hel, Assistant Professor (Pathology); Insulin Development and testing of novel HIV/AIDS vaccine strategies

Michael J. Klein, Professor (Pathology); Arthritis and collagen degradation diseases

Hiromi Kubagawa, Research Assistant Professor (Pathology); Immunoglobulin-like receptors

Dennis F. Kucik, Associate Professor (Pathology); Cell adhesion and motility

Robin Lorenz, Associate Professor (Pathology); Immune mediators of gastrointestinal disease

Upender Manne, Associate Professor (Pathology); Translational research in grastrointestinal malignancies

Jay M. McDonald, Professor and Chair (Pathology); Cell signaling in bone disease, AIDS and cancer

Joseph L. Messina, Associate Professor (Pathology); Insulin and growth hormone action and resistance in trauma and infections

Stephen A. Moser, Professor (Pathology); Pulmonary mycotic infections

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

Rakesh Patel, Associate Professor (Pathology); Inflammation; free radicals; atherosclerosis; sepsis; nitric oxide; hemoglobin; antioxidants; endothelial cell biology

Selvarangan Ponnazhagan, Associate Professor (Pathology); Adeno-associated virus gene therapy

Kevin A. Roth, Professor (Pathology); Molecular regulation of neuronal cell death

Gene P. Siegal, Professor (Pathology); Gene therapy of solid tumors

Ken Waites, Professor (Pathology); Diagnostic microbiology, epidemiology and mechanisms of antimicrobial resistance

Casey T. Weaver, Professor (Pathology); CD4 T cells

Danny Welch, Professor (Pathology); Biology and genetics of cancer metastasis

Program Information and Objectives

A graduate program in molecular and cellular pathology, leading to the Ph.D. degree, is offered by the Department of Pathology. The program is administered by a committee composed of members of the graduate faculty and two Pathology Ph.D. candidates:

Scott W. Ballinger, Ph.D.- Program Director

Thomas Clemens, Ph.D.- Director, Division of Molecular and Cellular Pathology

Xu Cao, Ph.D.

James Cody, Pathology Ph.D. Candidate & Presiding Officer

Joanne Douglas, Ph.D.

Xu Feng, Ph.D.

T. Scott Isbell, Pathology Ph.D. Candidate and Vice-Presiding Officer

Robin Lorenz, M.D., Ph.D.

Rakesh Patel, Ph.D.

Selvarangan Ponnazhagan, Ph.D.

Danny R. Welch, Ph.D.

Students demonstrating superior scholarship who desire careers in academic and investigative pathology are encouraged to apply. Acceptance of students is based on Graduate School admission criteria, letters of recommendation, assessment of motivation, and a personal interview by the Pathology Graduate Committee.

Admission is open to highly motivated students with strong backgrounds in the biological sciences. It is recommended that students with B.Sc. degrees have completed undergraduate courses in physics, calculus, chemistry, organic chemistry, biology, or zoology and at least one advanced course in areas such as comparative anatomy, embryology, genetics, histology, or physiology.

The objective of the program is to train individuals for academic and investigative careers in disease mechanisms and processes. A combination of didactic and laboratory experience will be provided to achieve the following specific goals for each student: (1) understanding of basic disease mechanisms, (2) appreciation of modern techniques in cellular and molecular biology, (3) integration of molecular mechanisms of disease with pathophysiology, (4) application of the scientific method to problems in disease mechanisms through discerning experimentation, and (5) effective communication of information through teaching and writing skills.

Although the program is designed to acquaint the student with all major facets of experimental pathology and genomic research, specialization is encouraged. At present, students may choose to concentrate their efforts in any of the following areas: cardiovascular biology, immunopathology, oncology, comparative pathophysiology, metabolic and bone diseases, genetics of disease, animal models of disease, nutritional pathology, oral pathology, and pathology of various organ systems.

Ph.D. Program

This degree is granted on the basis of scholarly proficiency, distinctive achievement, and original research. Additional course requirements are not rigidly fixed but are planned to meet the needs and interests of individual students. All students are expected to gain competence in cognate fields (e.g., scientific method, computer applications, cellular and molecular biology) and become independent investigators in experimental pathology. Students are given opportunities to study modern techniques of teaching and to participate in teaching under the supervision of experienced instructors. Preparation and defense of an acceptable dissertation is the final requirement for award of this degree. The core curriculum includes Integrative Biomedical Sciences (IBS 700, 701, 702) and Graduate Pathology (PAT 700, 701).

Additional Information

Deadline for Entry Term(s):	Semester
Deadline for All Application Materials to be in the Graduate School Office:	March 1
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=24921**

For detailed information, contact Ralph Patterson, Program Coordinator, Volker Hall G019, 1530 3rd Avenue South, Birmingham, AL, 35294-0019.

Telephone: (205) 934-2445;

E-mail: **repatter@uab.edu**

Web: **http://peir.path.uab.edu/pathgrad/**

Course Descriptions

Please see website at **http://peir.path.uab.edu/pathgrad/** for a complete description of all required courses.

Pharmacology and Toxicology (Ph.D.)

Degree Offered:	Ph.D.
Director:	Dr. Coral Lamartiniere
Phone:	(205) 934-7139
E-mail:	**coral@uab.edu**
Web site:	**www.uab.edu/pharmtox**

Faculty

Edward P. Acosta, Associate Professor (Clinical Pharmacology); Pharmacokinetics of and Pharmacodynamics of Antiviral and Antiretroviral Drugs in Adults and Children with HIV Disease

Stephen Barnes, Professor (Pharmacology and Toxicology, Biochemistry and Molecular Genetics); Pharmacokinetics of Dietary Phytoestrogens and Mechanism of Their Action on Cancer and Heart Disease; Molecular Biology of the Amino Acid Conjugation of Bile Acids in Mammals; HPLC-Mass Spectrometry

Jimmy Bartlett, Professor (Optometry, Pharmacology and Toxicology); Clinical Ocular Pharmacology; Diagnosis and Treatment of External Ocular Disease and Glaucoma; Clinical Trials of Investigational Anti-Inflammatory, Anti-Infective, and Anti-Glaucoma Drugs

Donald Buchsbaum, Professor (Pharmacology and Toxicology; and Radiation Biology); Experimental Therapeutics With Radiolabeled Monoclonal Antibodies and Immunotoxins; Radiation Biology

Robert B. Diasio, Professor and Chairman (Pharmacology and Toxicology; Medicine; and Director, Division of Clinical Pharmacology); Biochemical, Molecular, Chemical, and Clinical Pharmacology of Antineoplastic Agents; Pharmacogenetics

Xu Cao, Assistant Professor (Pathology, Pharmacology and Toxicology); the Mechanisms of Differentiation of Multipotential Stem Cells Into Functionally Distinct Cell Types, Particularly, the TGF-Beta/BMP Transcription Factors That Control Initiation of Cascade Networks of the Cell Lineage Split

Ada Elgavish, Associate Professor (Genetics, Pharmacology and Toxicology, Urology); Molecular Mechanisms of Epithelial Cell Membrane-Extracellular Matrix Interactions: Role In Cancer and Chemoprevention

Charles N. Falany, Professor (Pharmacology and Toxicology); Protein Chemistry and Molecular Biology of Drug Metabolizing Enzymes and Molecular Biology of Bile Acid-Conjugating Enzymes

Clinton J. Grubbs, Professor (Surgery, Pharmacology and Toxicology); Nutrition; Reproductive Pathoendocrinology; Development of Animal Cancer Models; Metabolism and Binding of Chemical Carcinogens

Donald L. Hill, Research Professor (Pharmacology and Toxicology); Metabolism and Site of Action of Antitumor Agents, Chemopreventive Agents, Carcinogens, and Xenobiotics

Gail V. W. Johnson, Professor (Psychiatry and Pharmacaology and Toxicology); Professor (Psychiatry and Behavioral Neurobiology); Neuropharmacology and Biochemistry of Neurodegenerative Disorders, Including Alzheimer's Disease and Huntington's Disease; Signal Transduction; Metabolism and Function of Neuronal Cytoskeletal Proteins

Martin Johnson, Assistant Professor (Pharmacology and Toxicology); Biochemical, Molecular and Clinical Pharmacology of Antineoplastic Agents; Pharmacogenetics

Richard S. Jope, Professor (Psychiatry and Pharmacology and Toxicology); Neuropharmacology and Neurochemistry of Neurological Disorders, especially Alzheimer's Disease, and Psychiatric Diseases, expecially manic-depression; Regulation of Signaling Systems, Gene Expression, and Apoptosis/Survival

Helen Kim, Research Associate Professor (Pharmacology and Toxicology); Protein Biochemistry, Cell Biology, and Cytoskeletal Proteins in Normal and Disease States; Mechanisms of Estrogenic Factors in Modulating Cognition and Brain Function

Mahmoud el Kouni, Associate Professor (Pharmacology and Toxicology); Biochemical and Molecular Pharmacology of Nucleotide Metabolism in Mammalian Systems and Parasites

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

Coral A. Lamartiniere, Professor (Pharmacology and Toxicology); Environmental Toxicology; Molecular Endocrinology; Cause and Prevention of Mammary and Prostate Cancers

Xiaohua Li, Assistant Professor (Phychiatry, and Pharmacology and Toxicology); Neuropsychopharmacology and Clinical Psychopharmacology of Psychiatric Disorders; Role of Neurotrophic Factors and Regulation in Bipolar and Depressive Disordersancers

Elias Meezan, Professor (Pharmacology and Toxicology); Biochemical Pharmacology of Glycoconjugates in Health and Disease, Particularly Diabetes Mellitus

Dennis J. Pillion, Professor (Pharmacology and Toxicology); Endocrine Pharmacology; Administration of Insulin in Eye Drops and Nose Drops; Diagnosis and Treatment of Diabetes Mellitus

Denise R. Shaw, Research Associate Professor (Medicine, Pharmacology and Toxicology); Immunohematology and Immunotherapy

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

Hui Wang, Research Assistant Professor (Pharmacology and Toxicology); Molecular Therapeutics; Pharmacokinetics and Pharmacodynamics; Genetic-Based Therapy; Clinical Pharmacology and Clinical Trials; Cancer Prevention

Jun Wang, Research Instructor (Pharmacology and Toxicology); Cause and Prevention of Breast and Prostate Cancers; Molecular Endocrinology

Ruiwen Zhang, Associate Professor (Pharmacology and Toxicology); Antisense Therapy; Toxicology; Carcinogenesis; Anticancer Agents; Anti-AIDS Therapeutics; Cancer Prevention

Adjunct Faculty

John C. Besse, Associate Professor Emeritus (Pharmacology and Toxicology); Modulation of Vascular Smooth-Muscle Contractile Responses by Steroids

William P. McCann, Professor Emeritus (Pharmacology and Toxicology); Renal Physiology; Pharmacokinetics

Richard May, Adjunct Assistant Professor (Pharmacology and Toxicology); translational research for drug development (primarily for biotech and pharmaceutical companies) involving immune function assays, ELISAs, bone marrow progenitor cell assays, and assay development

William B. Parker, Adjunct Associate Professor (Pharmacology and Toxicology); Biochemical and Molecular Mechanism of Action of Anticancer and Antiviral Nucleoside Analogs

Program Information

The objectives of the program leading to the Ph.D. degree in Pharmacology and Toxicology are to prepare students for careers as research scientists in academia, government, or industry. Training and research programs include biochemical, endocrine, neuro-, cardiovascular, behavioral, and molecular pharmacology; environmental and molecular toxicology; chemical carcinogenesis and chemoprevention; and drug discovery, design, and toxicity

Admission to graduate study in Pharmacology and Toxicology requires a bachelor's degree in an appropriate science, such as chemistry or biology. Students should have completed courses in general and organic chemistry; mathematics through calculus; and general biology. Courses in biochemistry, physiology, and toxicology are also recommended. The Pharmacology and Toxicology graduate program committee reviews all applications for admission. Acceptance for graduate study in pharmacology is based on Graduate School admission criteria, and a personal interview with the graduate program committee if possible.

Completion of the requirements of the Ph.D. program normally requires four to five years for students entering with B.S. degrees. The general course of study will include introductory courses in pharmacology and toxicology, biochemistry, and physiology, as well as advanced courses selected in accordance with the student's area of specialization and with the guidance of the advisor and graduate study committee.

Additional Information

Deadline for Entry Term(s):	Fall only
Deadline for All Application Materials to be in the Graduate School Office:	June
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.
Graduate Catalog Description	**http://main.uab.edu/show.asp?durki=24923**

For detailed information, contact Dr. Coral Lamartiniere, Graduate Program Director, UAB Department of Pharmacology and Toxicology, Volker Hall, Room 124, 1670 University Boulevard, Birmingham, AL 35294-0019.

Telephone 205-934-7139

Fax 205-934-8240

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

Web **www.uab.edu/pharmtox/pharm.htm**

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.

Pharmacology (PHR)

701. **Graduate Pharmacology I**. Introduction to graduate pharmacology. Dose-response relationships, drug absorption, disposition and metabolism, drug receptors, agonists and antagonists, enzyme receptor binding kinetics, pharmacokinetics, biostatistics. 3 hours.

702. **Graduate Pharmacology II**. Neuropharmacology. Drug modulation of neurotransmission; drugs used in diseases of the nervous system; sympathetic agonists and antagonists; cholinergic agents; CNS pharmacology. 3 hours.

703. **Graduate Pharmacology III**. Cardiovascular, renal and GI pharmacology. Drug modulation of the cardiovascular system, GI tract and renal system. Anti-inflammatory and anti-allergic agents. 5 hours.

704. **Graduate Pharmacology IV**. Endocrine pharmacology and chemotherapy of disease. Hormones; antimicrobial agents; antiparasitic drugs; cancer chemotherapy; antiviral and antifungal agents. 5 hours.

705. **Graduate Pharmacology V**. Molecular pharmacology. Current topics, including interaction between a particular drug and its target with emphasis on current literature; mechanisms of drug action.

*720. **Lab Rotation in Pharmacology**. Introduction to laboratory methods, experimental design and execution. Sequential rotations (one per term) mentored and based on student's research. 5-8 hours.

723. **Medical Pharmacology.** Comprehensive treatment of pharmacology and therapeutics including principles of pharmacology, neuropharmacology, cardiovascular, renal and gastrointestinal pharmacology and chemotherapeutics. 6 hours.

725. **Modern Drug Design and Development.** This course covers various topics regarding modern drug research and development, including molecular targeting, lead compounds screening, genomics, biotechnology, pharmacological and toxicological evaluation, and regulatory issues.

730. **Research Assessment in Pharmacological Problems**. Original research proposal is written based on current library research and assistance of faculty member. Hypothesis formulation and experimental design. 2 hours.

744. **Protemics-Mass Spectrometry**. The goal of the course is to provide graduate students with the necessary skills to design experiments and evaluate the literature in the area of small and large scale analysis of the proteome in biological systems. This involves selection of the biological fraction for study, separation of the proteins therein, and qualitative and quantitative analysis of the individual proteins by mass spectrometry.

750. **Advanced Principles of Pharmacology I**. Basic Principles: Dose-response relationships, drug absorption, disposition and metabolism, enzyme-receptor binding kinetics, pharmacokinetics, drug receptors, agonists and antagonists, mechanisms of drug action, interaction between a particular drug and its target. Pharmacogenetics. Biostatistics. Neuropharmacology: Drug modulation of neurotransmission; drugs used in diseases of the nervous system; sympathetic agonists and antagonists; cholinergic agents, 4 hours.

751**. Advanced Principles of Pharmacology II.** Endocrine, CNS, cardiovascular, renal and GI pharmacology. Drug modulation of the cardiovascular system, GI tract and renal system. Chemotherapy of disease; Anti-inflammatory and anti-allergic agents, Hormones; antimicrobial agents; antiparasitic drugs; cancer chemotherapy; antiviral and antifungal agents, 4 hours

760. **Pharmacogenetics and Drug Metabolism**. This course is designed to provide the student with a more thorough understanding of the role of genetic variation in enzymes involved in the metabolism of important therapeutic drugs on the response to drug therapy. Genetic variation in drug metabolism is the major cause of individual variability in drug efficacy and toxicity. The course will focus on how genetic variability in major enzyme families such as the cytochromes P450 and UDP-glucuronyltransferases, and will utilize a combination of lectures, reports and seminars.

*790. **Advanced Pharmacology Seminar**. Recent advances in pharmacology and toxicology and departmental research in progress. 1 hour.

*798. **Doctoral Nondissertation Research**. 1-12 hours.

*799. **Doctoral Dissertation Research**. Prerequisite: Admission to candidacy. 1-12 hours.

Toxicology (TOX)

711. **Principles of Toxicology**. Foundation for understanding the basis of toxicology. Designed for doctoral students pursuing a career in toxicology; also appropriate for doctoral students studying pharmacology, veterinary medicine, pathology, forensic science, neuroscience, environmental health sciences, etc.

713. **Advanced Topics in Toxicology**. Foundation for understanding the basis of toxicology. Designed for doctoral students pursuing a career in toxicology. Exposes students to the most recent advances in contemporary toxicology.

720. **Laboratory Rotation in Toxicology.** Introduction to laboratory methods, experimental design and execution. 1-12 hours.

795. **Advanced Toxicology Seminar**. To facilitate the critical review of recent refereed publications in the field of toxicology. This will expose students to advanced knowledge and diversified subjects. All students enrolled in the UAB campus-wide toxicology program are required to participate. 1 hour.

798. **Doctoral Nondissertation Research in Toxicology**. 1-12 hours.

Toxicology Training Program (Ph.D.)

Degree Offered:	Ph.D.
Director:	Dr. Coral Lamartiniere
Phone:	(205) 934-7139
E-mail:	**Coral@uab.edu**
Web site:	**www.uab.edu/pharmtox**

Faculty

Robert Angus, Ph.D., Professor (Biology); Endocrine disrupters in aquatic models.

Shannon Bailey, Ph.D. Assistant Professor (Department of Environmental Health Sciences); Chronic ethanol consumption and hepatic energy metabolism,

Stephen Barnes, Ph.D., Professor (Pharmacology and Toxicology); Nutritional chemoprevention; drug metabolism and disposition; amino acid conjugation

Graeme B. Bolger, M.D., Associate Professor, (Medicine - Hematology/Oncology); Molecular pharmacology of cAMP signaling pathways; molecular genetics of prostate cancer.

Donald Buchsbaum, Ph.D., Professor (Radiation Oncology and Pharmacology and Toxicology); Experimental therapeutics with radiolabeled monoclonal antibodies and immunotoxins; radiation biology.

Robert B. Diasio, M.D., Professor and Chairman, (Pharmacology and Toxicology); Biochemical and clinical pharmacology and toxicology of antineoplastic agents; pharmacogenomics

Joanne Douglas, Ph.D. Assistant Professor (Pathology); Breast cancer metastasis.

Ada Elgavish, Ph.D., Associate Professor (Genomics and Pathobiology); Prostate cancer and diseases of the bladder.

Charles N. Falany, Ph.D., Professor (Pharmacology and Toxicology); Biochemical and molecular toxicology; sulfotransferases; chemical carcinogenesis.

Clinton J. Grubbs, Ph.D., Professor (Nutrition Sciences); Carcinogenicity of environmental pollutants and food additives; metabolism and binding of chemical carcinogens.

Santosh Katiyar, Ph.D., Assistant Professor (Dermatology); Cancer causation and chemoprevention.

Helen Kim, Ph.D., Research Associate Professor (Pharmacology and Toxicology); Proteomics approaches to identification of drug and toxin targets.

Jeffrey Kudlow, M.D., Director (Endocrinology), Professor (Pharmacology and Toxicology); Molecular Endocrinology; regulation of gene expression by glucose and the role of regulation in cell differentiation and function.

Coral A. Lamartiniere, Ph.D., Professor (Pharmacology and Toxicology); Molecular endocrinology; environmental and biochemical toxicology; cause and chemoprevention of mammary and prostate cancer; endocrine disruptors.

Erica Liebelt, M.D. Associate Professor (Emergency Medicine); Pediatric and clinical toxicology.

Rui-Ming Liu, Ph.D., Assistant Professor (Environmental Health Sciences); Regulation of g-glutamyltranspeptitase gene expression during tumor genesis caused by liver carcinogens

Richard D. May, Ph.D., Adjunct Assistant Professor (Pharmacology and Toxicology); Vaccine and drug development; in vitro immune function assays; immunotoxicology.

James B. McClintock, Ph.D., Professor (Biology); Chemical ecology, reproduction, nutrition, and physiology of marine invertebrates.

Donald Muccio, Ph.D., Professor (Chemistry); Use of conformationally constrained retinoids for cancer prevention and therapy.

Joanne E. Murphy-Ullrich, Ph.D., Professor (Pathology); Complex extracellular milieu that regulates cell differentiation, adhesion, and motility; matrix proteins and growth factors

Edward Postlethwait, Ph.D. Professor and Chairman (Environmental Health Services); Mechanisms of environmental oxidant-induced lung injury.

J. Michael Ruppert, M.D., Assistant Professor (Medicine); Genetic alterations on tumors; mechanisms of transformation by oncogenes.

Rosa Serra, Ph.D. Assistant Professor (Cell Biology); Cell and developmental biology, tumor biology, focus on the role and mechanism of action of members of the TGF-ß superfamily.

Jeffrey Smith, Ph.D., Professor (Pharmacology and Toxicology); Molecular pharmacology and toxicology of heavy metals; orphan receptors.

Laura Timares, Ph.D., Assistant Professor (Dermatology); Engineering dendritic cells for immunotherapy.

Stephen A. Watts, Ph.D., Professor (Biology); Physiology and biochemistry of growth and stress in aquatic organisms.

Dan Welch, Ph.D. Professor (Pathology); Cancer metastasis, oncogenes, suppressor genes.

Kurt Zinn, Ph.D., Professor (Medicine); Molecular Imaging in Animal Models

Ruiwen Zhang, M.D., Ph.D., Assistant Professor (Pharmacology and Toxiocology); Carcinogenesis; anticancer agents; antisense oligonucleotides.

Training Program Information

The Graduate Training Program in Toxicology is designed to educate students and provide research experience leading to the Ph.D. in the interdisciplinary field of toxicology. The core courses include biological chemistry and cellular physiology, pathophysiology and pharmacology of disease, molecular medicine and functional genomics, pharmacology, and toxicology. A student in good standing after completing the core curriculum will identify a mentor and complete electives and dissertation research in a participating degree-granting program. Students are expected to conduct original research addressing specific toxicology problems or projects in pharmacology and toxicology, molecular and cellular pathology, nutrition sciences, epidemiology, environmental health sciences, and biology.

UAB has the vision of providing students with diverse and expert toxicological training. Our faculty provide outstanding research opportunities in molecular and cellular toxicology, biochemical and endocrine toxicology, cancer causation and prevention, clinical toxicology, developmental toxicology, environmental toxicology, epidemiology and risk assessment, forensic toxicology, molecular and cellular toxicology, neurotoxicology, and nutritional chemoprevention and toxicology.

Education and research training in UAB's Graduate Training Program in Toxicology is designed to prepare individuals for careers in academia, industry, and government.

Applications for predoctoral studies are considered from students who have received or expect to receive a B.S. or M.S. degree in biology, chemistry, or a related discipline. A minimum GPA of 3.0 on a 4.0 scale and a combined score of 1100 on the verbal and quantitative portions of the GRE are preferred. Interviews and visits are encouraged. Accepted students usually receive stipend and tuition assistance.

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.)
Graduate Catalog Description	**http://main.uab.edu/show.asp?durki=24932**

For detailed information, contact Dr. Coral A. Lamartiniere, UAB Department of Pharmacology and Toxicology, VH 124, 1530 3rd Avenue South, Birmingham, Alabama 35294-0019.

Telephone 205-934-7139

Fax 205-934-8240

E-mail: **Coral@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.

Toxicology (TOX)

711. **Principles of Toxicology**. Target organ toxicology. Developmental endocrine, reproductive, regulatory toxicology. Fall.

713. **Advanced Topics in Toxicology**. Spring

720. **Toxicology Laboratory Rotation**. 1-9 hours.

795. **Advanced Toxicology Seminar**. Critical review of recent referred publications in the field of toxicology. 1 hour.

798. **Doctoral Nondissertation Research**. 1-12 hours.

799. **Doctoral Dissertation Research**. Prerequisite: Admission to candidacy. 1-12 hours.

IBS 700. **Biological Chemistry and Cellular Physiology**. (8 credits). Fall.

IBS 701. **Pathophysiology and Pharmacology of Disease**. (8 credits). Spring.

IBS 702. **Molecular Medicine and Functional Genomics**. (8 credits). Summer.

*Cellular and Molecular Biology I-IV can substitute for the IBS series

Vision Science (M.S., Ph.D.)

Degree Offered:	Ph.D., M.S.
Director:	Dr. Kent Keyser
Phone:	(205) 975-7225
E-mail:	**ktkeyser@uab.edu**
Web site:	**www.visionscience.uab.edu**

Faculty

Franklin R. Amthor, Associate Professor (Psychology); Retinal Physiology, Neural Information Processing

Jimmy D. Bartlett, Professor (Optometry); Low Vision, Ocular Disease

William J. Benjamin, Professor (Optometry); Ocular and Tear Fluid Physiology

Dale Benos, Professor/Chair (Physiology & Biophysics); Molecular physiology of ion channels

Mark Bevensee, Assistant Professor (Physiology & Biophysics); Cellular & molecular physiology of acid base transport and pH regulation

Claudio Busettini, Assistant Professor (Vision Science); Eye movements

David A. Corliss, Associate Professor (Vision Science); Eye Movements, Binocular Vision

Christine A. Curcio, Professor (Ophthalmology); Anatomy of Human Retina, Aging

Kent M. Daum, Associate Professor (Optometry); Eye Movements; Ocular Mobility

Lawrence J. Delucas, Professor (Optometry); Protein Structure

Allan C. Dobbins, Assistant Professor (Biomedical Engineering); Space and Form in Vision

Patti S. Fuhr, Clinical Assistant Professor (Department of Veterans Affairs); Vision Rehabilitation

Roderick J. Fullard, Associate Professor (Vision Science); Corneal and Tear Biochemistry, Dry Eye

Paul D. R. Gamlin, Professor (Vision Science); Eye Movements, Pupillary Light Reflex

Timothy J. Gawne, Assistant Professor (Vision Science); Central Visual Processing

Christopher A. Girkin, Assistant Professor (Ophthalmology); Optic Nerve and Retinal Imaging

Clyde R. Guidry, Assistant Professor (Ophthalmology); Retinal Wound Healing and Fibroplasia

Gregory Jackson, Assistant Professor (Ophthalmology); Visual dysfunction and aging

Kent T. Keyser, Professor (Vision Science); Neurotransmitters and Receptors

Robert N. Kleinstein, Professor (Optometry); Myopia, Refractive Errors

Timothy W. Kraft, Assistant Professor (Ophthalmology); Retinal Photoreceptors and Color Vision

Dennis F. Kucik, Professor (Pathology); Integrins

Robin A. J. Lester, Professor (Neurobiology); Central Nicotinic Channel Kinetics and Synaptic Function

Michael S. Loop, Associate Professor (Vision Science); Human and Animal Psychophysics, Color Vision

Richard B. Marchase, Professor (Cell Biology); Glucose Metabolism and Calcium Regulation

Richard Mayne, Professor (Cell Biology); Structure and Pathophysiology of Skeletal Muscle, Cartilage, Eye

Lori McMahon, Assistant Professor (Physiology & Biophysics); Neuronal inhibition and synaptic plasticity in hippocampus

Sthanam V.L. Narayana, Associate Professor (Optometry); Crystallography, Protein Structure

Thomas T. Norton, Professor (Vision Science); Regulation of Ocular Development, Emmetropization, and Myopia

Cynthia Owsley, Professor (Ophthalmology); Visual Psychophysics, Aging

Dennis J. Pillion, Professor (Pharmacology); Ocular Drug Delivery

Steven J. Pittler, Professor (Vision Science); Photoreceptor Function in Health and Disease

Douglas M. Ruden, Associate Professor (Public Health); Genetics of Rhabdomere Development in the Fruitfly Drosophilia

Lisa Schweibert, Associate Professor (Physiology & Biophysics) Role of epithelium in airway inflammation and molecular analysis of immune function in normal versus cystic fibrosis airway epithelia

A. Christopher Snyder, Professor (Optometry); Corneal Physiological Response to Contact Lens Wear

Om P. Srivastava, Professor (Vision Science); Cataractogenesis

Trygve O. Tollefsbol, Assistant Professor (Biology); Photoreceptor Function in Health and Disease

Donald B. Twieg, Associate Professor (Biomedical Engineering); MRI Technique Development for Functional Brain Imaging

Thomas R. Unnasch, Professor (Geographic Medicine); Molecular Study of Onchoceriasis

Shu-Zhen Wang, Associate Professor (Ophthalmology); Molecular Mechanisms of Early Neural Development

Rosalyn E. Weller, Associate Professor (Psychology); Neuroanatomy of the Visual System

David R. Whikehart, Professor (Vision Science); Corneal Biochemistry, Pharmacology

Program Information

Vision science is a multidisciplinary field encompassing events from the physical stimulus of light—through optical, biochemical, biophysical, and neuronal processes—to visual perception. The primary objective of the graduate program in vision science is to train individuals who will develop innovative approaches to teaching and research in vision science. To meet this objective, the M.S. and Ph.D. degrees require a curriculum covering major topics in vision science along with an original research project.

In addition to the course offerings in vision science, the program offers considerable flexibility in meeting the individual student's needs and career goals. The program encourages students to participate in the wide range of graduate courses offered by other departments of the university. Indeed, the program is interdepartmental in scope, with mentors in eleven different departments ranging from Cell Biology to Psychology.

The graduate program in vision science also offers a 7-year, O.D.-Ph.D. degree program, which combines training in clinical optometry with research in vision science. This is a unique opportunity for students to be trained as clinician-scientists whose knowledge of the eye and central visual pathways will lead to improved diagnosis, treatment, and prevention of blindness and visual impairment.

Although laboratory and research training are emphasized in both the Ph.D. and O.D.-Ph.D. programs, students also have opportunities to gain teaching experience. An appropriate background for study in vision science includes study at the baccalaureate or master's level in a biological, neurological, physical, or health-related science.

The program has an excellent record of preparing students for rewarding careers in teaching, research, or health care.

Admission and Financial Aid

Applications for admission to the graduate program in vision science are reviewed by the Graduate Admissions Committee. The committee looks at the applicants' scores in the

Graduate Record Examination (GRE). A combined score of at least 1000 in the verbal and quantitative sections of the GRE exam is required for the M.S. degree, and at least 1200 for the Ph.D. degree. Students currently enrolled in the Ph.D. program have an average GRE score of 1300. Admission also requires undergraduate grades of at least a B average over the previous 60 semester hours of credit, and three letters of recommendation. Applicants should have a strong background in the biological, physical, or health sciences. Students with suitable foreign qualifications are welcome to apply, but must demonstrate a command of written and spoken English, in addition to a score of at least 570 on the TOEFL examination. Over the past fifteen years, 40% of the graduates of the program have been women. We continue to encourage qualified women and underrepresented minorities to apply.

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.

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

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 (VIS 743 thru 748). Students then take three additional courses, selected by the student in consultation with the mentor, and a course in statistics. 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. Similarly, students interested in the cellular and molecular biology of the visual system may take the Cellular and Molecular Biology (CMB) Program core sequence, or they may select from the upper-level vision courses.

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.

The O.D.-Ph.D. program prepares students for careers that combine clinical optometry and clinical and/or basic research in vision science. This program involves a combination of basic science, research, and clinical training. The program is geared toward students who have

outstanding scholastic qualifications and are highly motivated to pursue careers as clinician-scientists.

Because students in this program will receive substantial benefits, admission is highly competitive. Information about admission requirements and application procedures can be obtained by writing to the graduate program director.

Additional Information

Deadline for Entry Term(s):	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.)
Comments	None
Graduate Catalog Description	**http://main.uab.edu/show.asp?durki=24933**

For detailed information, contact the graduate program manager, Ramona Hart, UAB Department of Vision Science, WORB 618, 1530 3rd Ave S., Birmingham, AL 35294-4390 (office location: Worrell Building, Room 618, 924 18th Street South).

Telephone 205-934-6743

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

Web **www.visionscience.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.

Vision Science (VIS)

Core Curriculum

743. **Optics and Imaging**. 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. 2 hours.

744. **Ocular Anatomy, Physiology & Biochemistry I**. Anatomy of the eye. Biochemistry and physiology of ocular tissues, including tears, cornea, aqueous humor, lens, vitreous and sclera. 2 hours.

745. **Ocular Anatomy, Physiology & Biochemistry II**. Continued examination of ocular anatomy, biochemistry and physiology of the eye. 2 hours.

746. **Retina and Subcortical Systems**. Retinal circuitry and receptive fields, including color coding, adaptation, circadian rhythms, parallel pathways, and development.

747. **Central Visual Mechanisms I**. Structure and function of geniculostriate parallel pathways, subcortical projections, and the oculomotor system.

748. **Central Visual Mechanisms II**. Analysis of the visual scene by cortical neurons, including temporal coding, motion detection, shape analysis, leading to visual perception.

Elective Curriculum

700. **Vision Literature Review**. Review of vision related literature and preparation for giving presentations.

701. **Visual Sensitivity and Resolution**. Photochemical processes, transduction, absolute and increment thresholds, light and dark adaptation, spatial interactions, spatial resolution and visual acuity, temporal interactions, and temporal resolution.

702. **Color Vision**. Perception of wavelength as color; colorimetry, color vision theories, trichromatic-opponent colors theory, neurophysiology of color vision.

710. **Ocular Biochemistry**. Biochemical components and metabolites in visual system: carbohydrates, proteins, lipids, and nucleic acids; emphasis on scientific inquiry, methodology, and significance of ocular biochemical research. 2 hours.

724. **Applied Statistics in Basic and Clinical Science**.

729. **Introduction to Neurobiology/Marine Biology**. 4 hours.

741. **Special Topics in Visual Neurobiology**. 1 hour.

742. **Special Topics in Corneal Research**. 1 hour.

750. **Special Topics in Retinal Research**. 1 hour.

751. **Retinal Morphology & Physiology**. 3 hours.

790. **Individual Studies and Advanced Topics**. 1-12 hours.

698. **Master's Nonthesis Research**. 1-12 hours.

699. **Master's Thesis Research**. Prerequisite: Admission to candidacy. 1-12 hours.

798. **Doctoral Nondissertation Research**. 1-12 hours.

799. **Doctoral Dissertation Research**. Prerequisite: Admission to candidacy. 1-12 hours.

BUSINESS

Accounting (M.Ac.)

Degree Offered:	M.Acct.
Director:	Dr. Richard A. Turpen
Phone:	(205) 934-8825
E-mail:	raturpen@uab.edu
Web site:	www.business.uab.edu

Faculty

Nell Adkins, Associate Professor (Accounting and Information Systems); Taxation

Lowell S. Broom, Professor (Accounting and Information Systems) and Associate Dean; Governmental and Not-for-Profit Accounting

Paul D. Crigler, Instructor (Accounting and Information Systems); Management Information Systems

Thomas P. Edmonds, Professor (Accounting and Information Systems); Managerial Accounting, Financial Accounting

Frank M. Messina, Professor (Accounting and Information Systems); Accounting Information Systems, Taxation

Ollie S. Powers, Associate Professor (Accounting and Information Systems); Financial Accounting

Julio C. Rivera, Associate Professor (Accounting and Information Systems); Management Information Systems

Sanjay K. Singh, Associate Professor (Accounting and Information Systems); Management Information Systems

Tommie W. Singleton, Assistant Professor (Accounting and Information Systems); Management Information Systems

Deborah W. Tanju, Professor (Accounting and Information Systems); Financial Accounting, Internal Auditing

Murat N. Tanju, Professor (Accounting and Information Systems); Financial Accounting, Managerial Accounting

Bor-Yi Tsay, Professor (Accounting and Information Systems); Accounting Information Systems, Managerial Accounting

Richard A. Turpen, Associate Professor (Accounting and Information Systems); Auditing, Financial Accounting

Kathrine O. Wilburn, Instructor (Accounting and Information Systems); Legal Studies

Mission and Objective

The mission statement of the Department of Accounting and Information Systems is as follows: "The Department of Accounting and Information Systems 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 from a regionally accredited institution and coursework equivalent to a UAB accounting degree).

2. A satisfactory score 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.

3. Satisfactory academic performance as measured by the undergraduate grade point average and particularly strong performance in the undergraduate accounting major.

The following additional admission requirements may apply to international applicants:

4. A satisfactory score on 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.

5. 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

The 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

AC 514 Governmental and Not-for-Profit Accounting

AC 572 Forensic Accounting and Information Technology Auditing

AC 600 Financial Reporting Strategy

AC 606 Advanced Topics in Auditing and Attestation

AC 620 Tax Entities

MBA 617 Technology Based Business Process Reengineering

Elective courses (3):

Students may select any 500-level course designated by a School of Business departmental prefix or any 600-level MBA course except those in the core, i.e., students may not select any of these foundation ("core") courses-MBA 609, 610, 620, 632, 633, 640, 650, 660.

Uniform CPA Examination

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 an undergraduate advisor in the Office of Undergraduate Programs and Student Services in the School of Business for specific guidance. Those interested in this option who already hold degrees from other institutions should also contact an undergraduate advisor.

(2) By obtaining a Master of Accounting degree. Those who already hold an undergraduate accounting degree (or its equivalent) and who desire a graduate degree in accounting may establish their academic eligibility under the Board's Accountancy Rules by obtaining a Master of Accounting degree. Under these Rules, those who hold graduate degrees from accounting programs 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 the Admissions Counselor in the Graduate School of Management.

Other Professional Accounting Certifications

Other examinations leading to professional certification (CMA, CIA, etc.) generally do not require academic course work beyond the baccalaureate degree. Students interested in other accounting certifications should contact an undergraduate advisor or 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 Graduate School Office:	Two months before term begins
Number of Evaluation Forms Required:	None, unless required by Program Committee
Entrance Tests	GMAT (TOEFL and TWE for international applicants whose native language is not English.)
Comments	An ECE “catalog match” is normally 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 Graduate School of Management:
School of Business, BEC 219
1150 Tenth Avenue South
Birmingham, AL 35294-4460

Telephone 205-934-8817
FAX 205-934-9200
E-mail, M.Ac. **raturpen@uab.edu**
E-mail, M.B.A. **mlake@uab.edu**
Web **www.business.uab.edu**

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. The general enrollment requirement for Master of Accounting courses is graduate standing and an undergraduate accounting major or its equivalent. Graduate accounting courses are not open to nondegree students.

Accounting (AC)

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.

572. **Forensic Accounting and Information Technology 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 572, AC 573, LS 571, and permission of the instructor.

600. **Financial Reporting Strategy**. Consideration of recent pronouncements of various authoritative bodies such as the FASB and SEC through research projects and case discussions.

606. **Advanced Topics in 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.

620. **Tax Entities**. Basic research tools in taxation; selected parts of Internal Revenue Code and Regulations; tax planning techniques.

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:	Melody Lake
Phone:	(205) 934-8817
E-mail:	**mlake@uab.edu**
Web site:	**www.business.uab.edu/mba**

Faculty

Nell Adkins, Associate Professor (Accounting and Information Systems); Corporate Taxes

Douglas Ayers, Associate Professor (Management, Marketing, Industrial Distribution); Business to Business Marketing, Product Management, Industrial Distribution

Theodore Bos, Professor (Finance, Economics and Quantitative Methods); Quantitative Analysis

Lowell Broom, Professor and Associate Dean (Accounting and Information Systems); Auditing, Governmental and Not-for-profit Accounting

Richard M. Burns, Associate Professor (Finance, Economics and Quantitative Methods); Financial Management, Financial Institutions

Paul Crigler, Instructor (Accounting and Information Systems); Management Information Systems

Manabendra Dasgupta, Associate Professor (Finance, Economics and Quantitative Methods); Economic Theory

W. Jack Duncan, University Scholar and Professor (Management, Marketing and Industrial Distribution); Strategic Management

Thomas Edmonds, Professor (Accounting and Information Systems); Financial and Managerial Accounting

Peter M. Ginter, Professor (Management, Marketing and Industrial Distribution); Policy and Strategic Management

Robert Holmes, Professor, Dean (Management, Marketing and Industrial Distribution); Strategic Management

Morris M. Gee, Instructor and Internship Director (Management, Marketing and Industrial Distribution); Marketing, Retail and Entrepreneurship

Eric P. Jack, Assistant Professor (Management, Marketing, Industrial Distribution); Operations Management

Karen Kennedy, Associate Professor (Management, Marketing, Industrial Distribution); Personal Selling and Marketing Strategy

Susan Key, Associate Professor and Executive Director, Management (Management, Marketing and Industrial Distribution); Social, Legal, and Ethical Environment of Business

Seung-Dong Lee, Professor (Finance, Economics and Quantitative Methods); International Economics, Applied Economic Theory

Warren S. Martin, Professor (Management, Marketing and Industrial Distribution); Survey Research, Marketing Research, Industrial Distribution

Frank M. Messina, Professor and Chairman (Accounting and Information Systems); Fraud Prevention

George M. Munchus, III, Professor (Management, Marketing and Industrial Distribution); Human Resource Management, Labor Relations

Philip Musa, Associate Professor (Management, Marketing and Industrial Distribution); Production and Operations Management

Lance Nail, Associate Professor and Chairman (Finance, Economics and Quantitative Methods); Wealth Creation

Thomas L. Powers, Professor (Management, Marketing and Industrial Distribution); International Marketing, Strategic Marketing

Julio C. Rivera, Associate Professor (Accounting and Information Systems); Management Information Systems

Robert A. Robicheaux, Professor and Executive Director, Marketing and Industrial Distribution (Management, Marketing and Industrial Distribution); Marketing and Retail

Sanjay K. Singh, Associate Professor (Accounting and Information Systems); Management Information Systems

Tommie Singleton, Associate Professor (Accounting and Information Systems); Accounting and Information Systems

Robert E. Stanford, Professor (Finance, Economics and Quantitative Methods); Operations Research

Deborah Tanju, Professor (Accounting and Information Systems); Financial Accounting, Internal Auditing and Accounting Systems

Murat Tanju, Professor (Accounting and Information Systems); Financial Accounting

Bor-Yi Tsay, Professor (Accounting and Information Systems); Managerial Accounting and Accounting Systems

Richard Turpen, Associate Professor (Accounting and Information Systems); Financial Accounting and Auditing

Joseph G. Van Matre, Professor (Finance, Economics and Quantitative Methods); Multivariate Analysis, Total Quality Management

Joe Walker, Associate Professor (Finance, Economics and Quantitative Methods); Financial Management

Frank Watkins, Associate Professor (Accounting and Information Systems); Taxation and Business Law

Barbara Wech, Assistant Professor (Management, Marketing, Industrial Distribution); Organizational Behavior

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 M.B.A. 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

Requests for information concerning admission procedures should be directed to the UAB Graduate School of Management. 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. Applicants must have completed satisfactorily an undergraduate calculus course within the previous five years of application or must pass a proficiency exam or complete the Graduate School of Management Calculus Review. In addition, foreign student applications must have a minimum score of 213 (computer-based) or 550 (Paper-based) on the TOEFL.

Admission to the M.B.A. program is competitive. In order to be considered, applicants must submit official transcripts of baccalaureate work from all universities or colleges attended and GMAT scores. In addition, admission preference is given to applicants with a minimum two years full-time professional work experience. The number of qualified applicants admitted may have to be limited when resource constraints and optimum enrollment considerations so dictate.

Candidates interested in non-degree seeking admission must meet admission requirements for the MBA program. We will require a resume, copies of transcripts, and GMAT scores along with the application. We will accept candidates with terminal degrees who have not taken the GMAT. 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.

Program Requirements

The M.B.A. 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 M.B.A. program; however, students with applicable undergraduate courses in business may have certain core courses (MBA 609, 620, 632, 633, 640, 650, 660) waived. The minimum degree requirement is 36 semester hours.

After the student is admitted to the program, the M.B.A. graduate advisor is available to meet with the student, if needed, to help outline a plan of study. Once admitted, students are expected to complete at least three courses during each 12-month period. Each candidate for the M.B.A. must file formal application for the degree in the Graduate School of Management Office at least three months before the expected date of graduation.

Program Information

The M.B.A. 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 M.B.A. 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:	None
Entrance Tests	GMAT (TOEFL and TWE also required for international applicants whose native language is not English.)

Contact Information

For detailed information, contact the UAB Graduate School of Management, School of Business, Room 210, 1150 10th Avenue South, Birmingham, Alabama 35294-4460.

Telephone 205-934-8817

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

Web **www.business.uab.edu/mba**

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.

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. **Strategic Cost Management** . Determination and use of cost data for decision making, control and evaluation of performance, and formulation of goals and budgets. 3 hours.

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 610, and 660. 3 hours.

621. **Advanced 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 & Organizational 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 or 661. 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 Analysis**. Problems and strategic considerations of firms engaged in international business. Prerequisites: MBA 632 or equivalent. 3 hours.

640. **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-held corporations and other complex business organizations. Prerequisite: Graduate standing. 3 hours.

615. **Technology Based Entrepreneurship**. Technology Based Entre- and Intra-preneurship. MBA 611 as the prerequisite. 3 hours.

616. **Information Systems Planning and Decision Making**. Provides the foundation for the strategic planning of information systems and solving problems faced by decision makers. MBA 611 as the prerequisite. 3 hours.

617. **Enterprise Application Implementation**. Provides the managerial foundation for developing and implementing large-scale enterprise applications. MBA 611 as the prerequisite. 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. **International Financial Management**. Financial analysis and decision making in international context. Prerequisite: MBA 620. 3 hours.

625. **Real Estate Decision Analysis**. The theory, principles and techniques of real estate investment analysis, including such topics as risk analysis, financial leverage, cash-flow approaches, lease vs. buy, portfolio analysis and tax effects. Prerequisites: graduate standing or permission of the Chair of the Department. 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.

673. **Product Innovation Management**. Introduction of the process of new product development, managing existing products and product deletion decisions. Prerequisite: MBA 620, 650 or HA 671. 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**. Focuses on entrepreneurs who attempt to build businesses that commercialize university-owned intellectual property. The 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. Prerequisite: Graduate standing. 3 hours.

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. Prerequisite: Graduate standing. 3 hours.

698. **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 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 Dr. Rick Turpen.

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 Dr. Rick Turpen.

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 Dr. Rick Turpen.

MG 507. **Management of the Information Resources**. Managerial aspects of management information systems. Topics include planning and controlling information resources, organizing information resource function, computer hardware, and environment of computer industry. Prerequisite: MBA 611. 3 hours.

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 530. **Industrial Distribution Operations**. Management concepts, principles, and applications for effective operations of industrial distribution firms. Concepts of value-added, financial systems, inventory management, purchasing, vendor evaluations, profitability analysis, and warehouse management. Requires an undergraduate degree in either a field of Engineering or Natural Sciences.

MK 535. **Industrial Distribution Policies and Problems**. Cases incorporating current approaches and procedures for attaining optimum manufacturer/distributor/customer relationships. Methods for planning, implementing, and controlling distribution strategies. Topics include demand analysis, profitability and multi-branch operations, total quality management concepts, and forecasting. Requires an undergraduate degree in either a field of Engineering or Natural Sciences.

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.

QM 525. **Applied Regression Analysis**. Simple, multilinear, and polynomial regression analysis. Model selection, inferential procedures, and application with computer. Prerequisite: MBA 660. 3 hours.

DENTISTRY

Dentistry (M.S.)

Degree Offered:	M.S.
Director, Dentistry:	Dr. Firoz Rahemtulla
Phone:	(205) 934-1693
E-mail:	**firoz@uab.edu**
Web site:	**www.dental.uab.edu**

Faculty

Ruth Aponte-Wesson, Assistant Professor (Prosthodontics); Biomechanical and Clinical Behavior of Dental Implants

Andrei Barasch, Associate Professor (Diagnostic Sciences); Oral Health and Function in Medically Complex Patients, Oral Cancer Treatment, Oral Oncology

James Broome, Professor (Prosthodontics); Polymers, Adhesives, Physical and Mechanical Testing, Clinical Research

John O. Burgess, Professor (Prosthodontics); Clinical Trials, Caries Models, Dental Materials

Mary Lynne Capilouto, Professor Emeritus (Diagnostic Sciences); Dental Epidemiology, Advanced General Dentistry

Noel K. Childers, Professor (Pediatric Dentistry); Streptococcus mutans, Dental Caries, Oral Immunization, Liposomes

John M. Coke, Professor (Diagnostic Sciences): Oral Medicine, Clinical Pharmacology, Hospital Dentistry

Joeseph Deatherage, Associate Professor (Oral Maxillofacial Surgery); Obstructive sleep apnea syndrome, bone grafting and osteogenic grafting materials, accelerated osteogenic orthodontics.

Paul Eleazer, Professor (Endodontics): Microbiology of Waterlines, Microbiology of Endontic Anaerobic Pathogens

Milton Essig, Professor (Comprehensive Dentistry); CAD-CAM, Ceramic Bonded Restorations

Andre Ferreira, Assistant Professor (Orthodontics); Temporary anchorage, self ligation

Steven J. Filler, Professor (Diagnostic 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

Niclaas Geurs, Associate Professor (Periodontics); Translational 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 (Diagnostic Sciences); Oral Epidemiology, Dental Health Services

Daniel Givan, Assistant Professor (Prosthodontics and Biomaterials); Composite, Resin, Wear, Fatigue

Timothy Heaven, Associate Professor (Comprehensive Dentistry); Dental Digital Imaging, Use of Computer in Digital Imaging Analysis

Yung-Tsung Hsu, Associate Professor (Prosthodontics); 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, Assistant Professor (Oral and Maxillofacial Surgery); Osteoblast Differentiation, Transcriptional Regulation, Bone Remodeling, Gene-Knock-Out, Odontogenesis

Donald T. Karaki, Assistant professor (Diagnostic 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

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 (Diagnostics Sciences): Dental Epidemiology, Research Methods, Biostatistics

Perng-Ru Liu, Professor (Comprehensive Dentistry); Dental CAD-CAM, Esthetic, and Dental Implant Restorations

Patrick J. Louis, Associate 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 (Diagnostic Sciences); Early Occlusal Caries, Geriatric Dentistry, Preventive Dentistry, Evidence-Based Dentistry

Raquel Mazer-Gurmendi, Associate Professor (Comprehensive Dentistry); Dental Materials, Composite Resins, Adhesives, Clinical Investigation, Physical and Mechanical Testing

Michael McCraken, Associate Professor (Prosthodontics); Dental Implants, Biomimetic Materials, Growth Factors

Lillian Mitchell, Assistant Professor (Prosthodontics);

Steven C. Mitchell, Assistant Professor (Pediatric Dentistry); Early Childhood Caries, Technology, Education

Leonard A. Mueninghoff, Professor (Prosthodontics); Implants, Biomaterials, Microleakage, Adhesives, Veneering, Composites

S. Jean O'Neal, Professor (Prosthodontics); Fixed Prosthodontics, Color and Clinical Evaluation of Dental Materials

Kent G. Palcanis, Professor (Periodontology); Clinical Periodontology, Control of Periodontal Disease

Firoz Rahemtulla, Professor (Prosthodontics); Connective Tissue Biochemistry, Oxidants and Antioxidant Enzymes, Salivary Proteins, Peroxidases

Lance Ramp, Assistant Professor (Comprehensive Dentistry); Wear and Degradation of Dental Materials

Merrie H. Ramp, Associate Professor (Comprehensive Dentistry); Dental materials Testing

Michael Reddy, Professor (Periodontics); Periodontal Disease Progression, Implants, Periodontal Therapeutics

Michelle Robinson, Associate Professor (Diagnostic Sciences);

John Ruby, Associate Professor (Pediatric Dentistry); Pulpotomy, Pulpectomy, Innate Immunology, Genotyping, *Treponema denticola*

P. Lionel Sadowsky, Professor (Orthodontics); Temporomandibular Joint Dysfunction, Growth and Treatment, Surgical Orthodontics, Bonding

Nasser Said-Al-Naief, Assistant Professor (Pathology); Head and Neck Cancer, Bone Related Pathology

Somasak Sittitavornwong, Assistant Professor (Oral Maxillofacial Surgery): Obstructive sleep apnea, airway, fluid dyanmics

Huw Thomas, Professor (Pediatric Dentistry): Mineralization, Oral Health, Tooth Formation

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 Assistant Professor (Orthodontics); Occlusion, Temporomandibular Dysfunction, Orthodontics

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 (Periodontology); Chemotherapy of Plaque, Clinical Trials in Periodontal Diseases

Richard Weems, Associate Professor (Diagnostic Sciences); Dental Radiology, Digital Radiographic Imaging, Diagnostic Decision Support Software

Hui Wu, Assistant 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. Firoz Rahemtulla, University of Alabama School of Dentistry, School of Dentistry Building, Box 54, 1919 Seventh Avenue South, Birmingham, AL 35294-0007.

Telephone 205-934-5407

Fax 205-934-0208

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

Web **www.dental.uab.edu**

Master of Science with Emphasis in Oral Biology

The Department of Pediatric 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 Medical Center. 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. 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.

Applications and transcripts should be received no later than December 1 to enroll in the summer semester of the following year.

Financial assistance is not available. Students must show that they can support themselves.

Contact

For further information and application materials, contact:

The University of Alabama at Birmingham
The Graduate School
Room 511, University Center
Birmingham, AL 35294 U.S.A.
Telephone: (205) 934-8227

OR

Jannet Katz, DDS, PhD
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University of Alabama School of Dentistry
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e-mail: meow@uab.edu

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 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.

698. **Non-Thesis Research**.

699. **Thesis Research**. Prerequisite: Admission to candidacy.

EDUCATION

Education: General Information

General Information

UAB's programs in education are fully approved by the Interstate Agreement on Qualifications of Educational Personnel, the National Association of State Directors of Teacher Education, and the National Council for Accreditation of Teacher 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 (SDE). 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.

Students who wish to add to an existing certificate through a SDE evaluation letter must be eligible for admission to the Graduate School. In addition, a copy of the SDE letter must be filed with the appropriate department chairperson and with Academic Advising Services, Room 100, School of Education Building, before coursework is begun. In some instances, prerequisites will have to be met in order to enroll in the desired courses

Education—Curriculum and Instruction

Director:	Dr. Charles Calhoun
Phone:	(205) 934-5371
E-mail:	**CCalhoun@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.)

Faculty

Jerry T. Aldridge, Professor (Early Childhood Education); Early Childhood, Special Education, Elementary Education

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

Anarella Cellitti, Associate Professor (Early Childhood Education); Early Childhood Development, Foundations of Early Childhood Education, Multi-Cultural Education

Lois M. Christensen, Associate Professor (Elementary Education); Elementary Social Studies, Qualitative Research Methodology, Elementary Preservice Teacher Education, Ethnographic Processes, Study of Diversity, Women, and International Topics

Mona Eason, Assistant Professor/Associate Dean (Early Childhood); Early Childhood/Elementary Education

Kay Emfinger, Assistant Professor (Early Childhood); Early Childhood Development, Curriculum Development, Curriculum Theory

Patricia Fitzgerald, Clinical Instructor (Elementary Education); Classroom Management, Organizational Skills of Teachers

Thomas W. Jambor, Associate Professor Emeritus (Early Childhood Education); Early Childhood Development, Play Environments, Development Through Play

Consttance Kamii, Professor (Early Childhood Education); Early Childhood Education and Theory of Jean Piaget

Lynn Kirkland, Associate Professor (Early Childhood Education); Early Childhood Development, Early Childhood Curriculum

Janice Kluge, Associate Professor (Art); Art Education, Drawing, Sculpture

Roberta A. Long, Professor Emerita (Elementary Education); Reading and Language Arts, Children's Literature

Gary L. Manning, Professor Emeritus (Elementary Education); Elementary Education, Individualization of Instruction, Language Arts and Reading

Maryann M. Manning, Professor (Elementary Education); Reading and Language Arts, Individualization of Instruction, Creative Teaching

Kathleen Martin, Assistant Professor (Early Childhood Education); Reading, Child Development, Reading Recovery

Lee Meadows, Associate Professor (High School Education); Science Education, Multicultural Issues, K-14 Science

Dail W. Mullins, Associate Professor Emeritus (High School Education); Science Education (Early Childhood and Secondary)

Eddie P. Ort, III, Professor Emeritus (Elementary Education); Elementary School Social Studies, Curriculum Development and Evaluation

Janice Patterson, Associate Professor (Elementary Education); School/University Partnerships, Resilience for Teachers and Students in Urban Schools, Teacher Leadership, and Children's Literature

Tonya Perry, Teacher In Residence (Secondary Education); Language Arts Education

Cecilia Pierce, Associate Professor (High School Education); Social Studies Education, Curriculum Development, Qualitative Research

David Radford, Associate Professor (Science Education); Assessment, Professional Development

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); Discourse Analysis for ESL Teachers, Grammar for ESL Teachers, Teaching in a Multicultural Society

Deborah Strevy, Assitant Professor (Early Childhood Education); Language Arts, Early Childhood Education

Stephen S. Underwood, Associate Professor Emeritus (Elementary Education); Science Education, Analysis of Teaching and Learning Environment

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 33 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 and a minimum GPA of 3.00. An outline of the specific course requirements can be obtained from the office of the graduate program director or the Academic Advising Office in the School of Education. The M.A.Ed. programs satisfy the academic requirements for the 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. The AA programs satisfy AA certification requirements, but do not lead to a 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 only once annually, with the program of study beginning in June (summer term). Application packets must be complete in the Graduate School office, at the latest, by six weeks before the program begins.

Contact Information

For detailed information, contact Dr. Jerry Aldridge (Early Childhood), Dr. Joe Burns (Elementary) or Dr. Lee Meadows (Secondary), 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: Issues in Developmental Theory**. Historical, sociological, and psychological influences on theories of development. Prerequisites: Graduate course in development or educational psychology and admission to doctoral program.

731. **Doctoral Seminar II: Children and Society**. Societal influences on child development. Role of family and various agencies in different cultures. Prerequisite: Admission to doctoral program.

732. **Doctoral Seminar III: Special Topics in Early Childhood and Development Studies**. Specific topic announced in class schedule. Prerequisites: ECE 730 and 731. 1-3 hours.

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: Master's degree.

736. **Personality Development of the Young Child**. Theoretical perspectives; review of research, including cross-cultural studies. Prerequisite: Admission to doctoral program.

737. **Parent, Child, School Interface**. Historical development of parent involvement. Theoretical bases of family-school interactions. Prerequisite: Admission to doctoral program.

738. **The Consultation Process and the Young Child**. Problem areas affecting young children; skills for working with families and community agencies. Prerequisites: ECE 730 and 731.

739. **Developing Interpersonal Competence for Leaders**. Relationships with coworkers and subordinates. Various approaches to interpersonal relationships. Prerequisites: Admission to doctoral program.

740. **Research Apprenticeship**. Planning, implementation, analysis, and presentation of research. Prerequisites: ECE 730 and 731. 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. Prerequisites: EPR 607, 608, 609, and ECE 740.

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. Prerequisites: ECE 730, 731 and 732.

747. **Social Development of Young Children**. Factors influencing socialization of young children. Prerequisites: ECE 730 and 732.

748. **Research in Infancy**. Theoretical and empirical evidence relating to psychomotor domain. Prerequisite: Admission to doctoral program in early childhood education.

749. **Advanced Early Childhood Curriculum**. Historical, philosophical, psychological, and social thought influencing curriculum in early childhood education. Prerequisites: ECE 730, 731, and 732.

750. **Literacy Before School**. Written language development of preschool children. Prerequisites: Master's degree and two courses in language development.

751. **Schooling and Literacy Instruction**. Primary-level literacy instruction and children's literacy development. Prerequisites: Admission to doctoral program in early childhood education and two courses in language development.

752. **Theory and Research on Literacy Development and Instruction**. Philosophical and psychological beliefs regarding literacy development. Prerequisite: Admission to doctoral program in early childhood education.

753. **John Dewey and the Early Childhood Curriculum**. Dewey's philosophy, epistemology; relationship to early childhood education and development.

760. **Current Issues in Education**. 1-3 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. Prerequisites: Master's degree and one course in language development or equivalent.

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**. 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)

600. **Transition into the Teaching Profession**. Introductory course in 5th-Year (nontraditional) Program for high school education. Developing basic teaching skills and understanding of interdependence among all levels within school and community. Prerequisite: Acceptance into 5th-Year Program in high school education.

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.

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.

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.

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.

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.

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.

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.

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.

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.

573. **Teaching in a Multicultural Society**. Implications of cultural pluralism for teaching, student learning, curriculum planning, and instructional techniques.

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**. Course 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**. Course is 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**. Course is 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**. This 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**. Course involves 18 Saturday seminars during the school year to prepare teachers for National Board Candidacy and to support candidates as they go Y ª \ \ 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.

615. **Grammar for ESL Teachers.** This course is 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.

620. **Special Topics in ESL**. Overview of institutional structures that support new language learners, curriculum and teaching modifications supported by second language acquisition theory, support networks, and legal issues. (Recent topics: K-12 Equal Access, Teaching Adult ELLs, and Teaching ESL for non-majors.) 3 hours.

625. **Discourse Analysis for ESL teachers.** This course examines how communication – spoken and written – is structured so that it is socially appropriate and linguistically accurate. Different modes of analysis are outlined and evaluated in terms of their usefulness to language teachers. Then, new ways of looking at grammar, vocabulary, and phonology in the light of discourse analysis will be investigated. Students will consider examples from native-speaker and learner data and teaching approaches based on the insights of discourse analysis. 3 hours.

630. **Methods and Materials of Teaching ESL**. Course examines traditional and current approaches to teaching English to speakers of other languages and curriculum materials, texts, and other resources. 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. 3 hours.

689. **Internship Seminar in ESL**. Field projects for improving the delivery of ESL instruction. Non-certification MA candidates take this course in lieu of EESL 690. Approval of internship application. 3 hours.

690. **Internship in ESL, N-12**. The internship requires a minimum of 300 contact hours elementary (150 hours) and secondary (150 hours) settings. 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. Prerequisites: Approval of internship application. 3, 6, and 9 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.

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 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 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 methods.

616. **Teaching Mathematics in Secondary School**. Philosophical and psychological principles applied to teaching math. Field experiences required. Prerequisite: Undergraduate 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**. This lab will provide public school observation experiences for music education students enrolled in EMU 502. Prerequisites: Permission of instructor. 1 hour.

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.

620. **Special Topics in ESL**. Overview of institutional structures that support new language learners, curriculum and teaching modifications supported by second language acquisition theory, support networks, and legal issues. 3 hours.

630. **Methods and Materials of Teaching ESL**. Course examines traditional and current approaches to teaching English to speakers of other languages and curriculum materials, texts, and other resources. 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. 3 hours.

690. **Internship in ESL, N-12**. The internship requires a minimum of 300 contact hours elementary (150 hours) and secondary (150 hours) settings. 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. Prerequisites: Approval of internship application. 3, 6, and 9 hours.

Education—Human Studies

Graduate program director (Education): *David Macrina*, **dmacrina@uab.edu**

Graduate program director (Public Health): *Patricia Lee*, **pal@uab.edu**

- Education, Counseling (Ed.S., M.A.)
- Education, Health (Ed.S., M.A.Ed.)
- Education, Health Education/Health Promotion (Ph.D.)
- Education, Physical (Ed.S., M.A.Ed.)

Faculty

Gypsy Abbott , Professor; Educational Psychology, Psychological Testing, Evaluation

Wajih Ahmad, Assistant Professor; Health Education - Epidemiology

Retta Evans, Associate Professor; Health Education - Youth Physical Activity and Nutrition, Body Image and Eating Disorders, Distance Education

Brian F. Geiger, Professor; Health Promotion Models, Comprehensive School Health, Technology, Community Education

Donna J. Hester , Associate Professor; Motor Development, Elementary Physical Education, Adapted Physical Education

Gary R. Hunter , Professor; Exercise Physiology, Sport Conditioning, Body Composition and Energy Metabolism

Maxie P. Kohler , Associate Professor; Personality Theory, Human Development, Educational Psychology

David M. Macrina , Professor; Health Promotion, Community Health, Planning and Administration

Cynthia J. Petri , Associate Professor; Health Behavior, HIV Education and Prevention, Technology, Theory

Jane Roy . Assistant Professor, Exercise Physiology

Gary L. Sapp , Professor; Cognitive Assessment, School Psychometry, School Psychology

Kristi Sayers Menear , Assistant Professor, Physical Education Pedagogy, Adapted Physical Education

Patricia M. Sheets , Assistant Professor; Rehabilitation Counseling, Legal and Ethical Issues in Counseling, Clinical Coordinator

Sandra K. Sims, Assistant Professor; Physical Education Pedagogy, Athletic Coaching

Scott W. Snyder , Associate Professor; Child Development, Measurement, Early Childhood Special Education, Program Evaluation

Laura Talbott, Assistant Professor; Health Education - Alcohol and Other Drugs, College Health

Program Contact Information:

Program	Coordinator	Room	Phone Number
Counseling	Ms. Patricia Sheets	157	(205) 934-8334
Health Education	Dr. Retta Evans	259	(205) 996-2701
Physical Education	Dr. Donna Hester	224	(205) 934-8336
Research	Dr. Scott Snyder	209	(205) 934-8475

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.

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.

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

See physical education course descriptions.

Health Education/Health Promotion (M.A.Ed.)

The health education graduate program (master's) is designed to prepare individuals for advanced health education careers in agency, schools, worksites, and allied health care settings. Program options allow students to choose between thesis or nonthesis options and select elective course work in a related field area or allied health area.

Programs of Study

Health Education Thesis & Health Education Nonthesis

Plan I (Thesis Option)

Thesis required (24 hours course work required.)

Major Courses (15 hours)

1. EPR 692. Introduction to Educational Research Design

2. HE 610. Foundations of Health Education

3. HE 640. Content Issues I or HE 641, Content Issues II

4-5. Choose 6 hours from the following:

HE 502	Mental Health and Stress Management
HE 508	Drug Use and Abuse
HE 521	Health Communication
HE 523	Human Sexuality
HE 531	Planning and Evaluating Effective Health Education and Promotion Programs
HE 532	Administration of Health and Fitness Programs
HE 593	Educational Gerontology
HE 598	Issues in Women’s Health
HE 601	Current Readings in Health Education
HE 602	Alcohol and Society Seminar
HE 606	Issues in Disease Control
HE 611	School Health Programs
HE 642	Health Behavior and Health Education
HE 689	Methods and Materials for Planning Health Education Programs>
HE 691	Special Topics in Health Education
HE 693	Advanced Field Experience in Health Education
HE 697	Evaluation of Health Education Programs

Research Course (3 hours)

EPR 609 Statistical Methods and Research in Education: Intermediate. Prerequisite: EPR 608.

Plan II (Non-Thesis Option)

Nonthesis (33 hours course work required.)

Major Courses (15 hours)

1. EPR 692. Introduction to Educational Research Design

2. HE 610. Foundations of Health Education

3. HE 640. Content Issues I or HE 641, Content Issues II

4-5. Choose 6 hours from the following courses:

HE 531	Planning and Evaluating Effective HealthEducation and Promotion Programs
HE 532	Administration of Health and Fitness Programs
HE 642	Health Behavior and Health Education
HE 689	Methods and Materials for Planning Health Education Programs
HE 697	Evaluation of Health Education Programs

HE elective Choose at least 3 hours from the following courses

HE 502	Mental Health and Stress Management
HE 508	Drug Use and Abuse
HE 521	Health Communication
HE 523	Human Sexuality
HE 593	Educational Gerontology
HE 598	Issues in Women's Health
HE 601	Current Readings in Health Education
HE 602	Alcohol and Society Seminar
HE 606	Issues in Disease Control
HE 611	School Health Programs
HE 691	Special Topics in Health Education
HE 693	Advanced Field Experience in Health Education

Research Course. (3 hours)

EPR 609. Statistical Methods and Research in Education: Intermediate. Prerequisite: EPR 608.

Alternative Master's Teacher Education Program:

The purpose of the "Alternative Masters" program *(ATEP)* is the same as the class "B" level certification program. Students entering this program are not required to have a bachelor's degree in the same field. Prerequisite course work may therefore be required.

Prerequisite Coursework

HE 141	Personal Health
HE 223	Introduction to Epidemiology & Disease Impact
HE 342	Introduction to Health Education
HE 343	Theories & Determinants of Health Behavior/Community Applications
HE 402	Mental Health and Stress Management
HE 408	Drug Use & Abuse
NTR 220	Contemporary Issues in Nutrition
HE 423	Human Sexuality
HE 431	Planning and Evaluating Effective Health Education & Promotion Programs
HE 432	Administration of Health and Fitness Programs
EPR 414	Human Development

Required Coursework 43-49 semester hours)

HE 689	Materials & Methods of Teaching Health Education
EHS 600	Transition into Teaching
EHS 556	Classroom Management
ECY 600	Intro to Exceptional Learners
EDT 610	Computer-Based Instructional Technology
EPR 511	Intro to Measurement and Evaluation in Education
EDR 551	Reading in the Content Area
HE 695	Junior/Secondary Health Education (9.0)

Courses in the Teaching Field (at least one-third of the program shall be Teaching Field courses)

HE 610	Foundations of Health Education
HE 611	School Health Programs
HE 521	Health Communications
HE 601	Current Readings in Health Education
HE 642	Health Behavior and Health Education

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 above for more information about this program) or complete a teacher certification 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).

Master of Arts in Education and "A" level teaching certificate; Nonthesis (31-3 7 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
	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	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	(see approved list)	3

Professional Studies

EDT 610	Technology Competency	3
EPR 692	Introduction to Educational Research	3

Alternative A (Nontraditional 5th-Year Physical Education program) Nonthesis (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 604	Social Philosophies and Education	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	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

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 694	Seminar in Physical Education	3
	600- and 700-level Physical Education courses	15

(PE 643, 645, 647 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
EPR 607	Microcomputer Application	1
	Technology Competency	0-3
Electives with Permission of advisor	600- or 700-level Professional Studies or Teaching Field courses	3

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 Education (HE)

502. **Mental Health and Stress Management**. Fundamental concepts of mental health and mental illness, with emphasis on etiology, symptomology, treatment, and prevention of mental illness. Elementary skills, dynamics of stress, and contemporary methods of stress management. (Traditional and Online Sections Offered)

508. **Drug Use and Abuse**. Emphasis on emotional, intellectual, psychological, and social aspects of drug use. Misconceptions about drugs. Attitudes toward drugs and drug prevention and treatment programs. (Traditional and Online Sections Offered)

521. **Health Communication**. Skills appropriate for selected health problems; problem solving and referrals.

523. **Human Sexuality**. Biological, sociological, and cultural aspects of sexuality.

531. Planning and Evaluating 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.

532. **Administration of Health and Fitness Programs**. Administrative theory applied to health and fitness settings.

593. **Educational Gerontology**. Program preparation for generic consumers. Major health concerns facing many senior citizens and ways to communicate educational interventions. Prerequisite: Permission of instructor.

598. **Issues in Women's Health**. Historical and psychosocial factors that have and may continue to influence the potential health status of the American female. Major causes of morbidity and mortality as well as tips for health care system utilization.

601.**Current Readings in Health Education**. Review of literature in health education. Development of annotated bibliography pertinent to professional practice. Prerequisite: Permission of advisor.

602. **Alcohol and Society Seminar**. Effects of alcohol on individual health, family relations, and community life. Prerequisite: Permission of instructor.

606. **Issues in Disease Control**. Nature and distribution of disease; communicable and nutritional diseases of childhood; possibilities for prevention. Prerequisite: HE 223 or permission of instructor.

610. **Foundations of Health Education**. Issues in health education; school, community, or patient health education. Prerequisite: Permission of instructor.

611. **School Health Programs**. National, state, and local factors influencing school health programs; influences of official and nonofficial agencies. Historical perspective, present and future directions of profession and school health. Prerequisites: HE 342, 343, 431, and 489.

612. **Workshop in Health**. Concepts and methods to increase proficiency. Comprehensive health education K-6 or 7-12; health education in school, community, or both. 3 to 6 hours.

640. **Content Issues I.** 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.

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.

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.

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.

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.

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.

693. **Advanced Field Experience**. Professional practice and research supervised by qualified health education professionals in approved health education work setting. 3 or 6 hours.

695. **Junior/Secondary Health Education>**. Student teaching. Prerequisite: HE 610, 689, and other courses identified by advisor. 9 hours.

698. **Nonthesis Research**. 1-6 hours.

699. **Thesis Research**. Supervised research project. Prerequisite: Admission to candidacy and permission of advisor. 1, 2, 3, or 6 hours.

Health Education/Health Promotion (Ph.D.)

The Ph.D. program in Health Education/Health Promotion has been designed to provide students with the academic and practical experiential background to become leading practitioners and researchers in health education and health promotion. The program combines the resources of academic units from the University of Alabama at Birmingham (Schools of Education and Public Health) and the University of Alabama (College of Human Environmental Sciences).

Admission to Ph.D. program

Student applications are reviewed by a joint admissions committee composed of members of the participating academic units. 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 bachelor's or master's degree from an accredited institution in health education or a health-related field.

Program of Study

The Ph.D. 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. The requirements for the Ph.D. degree through the School of Public Health is a minimum of 67 credit hours: 43 hours of coursework, 12 hours of research internship and 12 hours of dissertation research.

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 their advisor.

The specific components of the Ph.D. program in health Education and Health Promotion are outlined below.

Ph.D. through the School of Education

I. Health Education and Promotion Courses

(UA = HHE, UAB-Public Health = HB, UAB-Education = HE)

A. Advanced Theoretical and Scientific Bases of Health Education and Health Promotion (HHE 605, HB 750, HE 705)

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**
IV. Research Internship	**12 hr**
V. Dissertation	**24 hr**

Ph.D. through the School of Public Health

I. Health Education and Promotion Courses

(UA = HHE, UAB-Public Health = HB, UAB-Education = HE)

A. Advanced Theoretical and Scientific Bases of Health Education and Health Promotion (HHE 605, HB 750, HE 705)	3 hrs
B. Health Communications Research (HHE 607, HB 730, HE 701)	3 hrs
C. Planning and Administration of Health Education and Health Promotion (HHE 606, HB 760, HE 710)	3 hrs
D. Doctoral Studies Seminar (HHE 604, HB 770, HE 692a)	3 hrs
	12 hrs

II. Advanced Research and Statistical Methods

A. Advanced Epidemiological Research Methods	4 hrs
B. Data Management / Computer Technology	3 hrs
C. Intermediate Statistical AnalysisI/ Statistical Methods	3 hrs

D. Advanced Health Program Evaluation	3 hrs
E. Intermediate Statistical Analysis II/ Statistical Methods and Research in Education: Intermediate	3 hrs
	16 hrs
III. Program Evaluation/Research Methods/Statistics Electives	**6 hrs**
IV. Social and Behavioral Sciences Electives	**9 hrs**
V. Research Internship	**12 hrs**
VI. Dissertation Research	**12 hrs**

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.

The Ph.D. 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 entering the program with a master's degree may transfer appropriate coursework to this program, but 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 their advisor.

The specific components of the Ph.D. program in health Education and Health Promotion are outlined below.

I. Health Education/Promotion Core Courses

(UA = HHE, UAB-Public Health = HB, UAB-Education = HE)

A. Advanced Theoretical and Scientific Basis of Health Education and Health Promotion (HHE 605, HB 750, HE 705)	3 hr
B. Planning and Administration of Health Education and Health Promotion (HHE 606, HB 760, HE 710)	3 hr
C. Health Communications Research (HHE 607, HB 730, HE 710)	3 hr
D. Doctoral Studies Seminar (HHE 604, HB 770, HE 695)	3 hr

Subtotal	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
IV. Research Internship	24 hr
V. Dissertation	24 hr
Total	72 hr

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

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. Course will

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.

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.

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.

Health Education - PhD (HE)

700. **Seminar in Health Education**. Presentation of health education research.

701. **Special Topic 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.

702. **Supervised Research in Health**. Research problem based on school, community, or public health education needs. Prerequisite: Permission of advisor. 3 or 6 hours.

703. **Advanced Field Experience**. Professional practice and research supervised by qualified health education professionals in approved health education work setting. 3 or 6 hours.

705. **Advanced Theoretical and Scientific Basis of Health**. Analysis of knowledge, attitude and behavior change strategies, and resulting effect on health status.

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.

720. **Evaluation of Health Education Programs**. Evaluation protocols in health education settings; needs assessments, process and formative evaluations, cost benefits, summary reports.

729. **Ed.S. Thesis Research**. Prerequisite: Admission to candidacy.

730. **Evaluation Research Methods**. Theory and application of behavioral evaluation research including preparation of research NIH type proposals.

731. **Health Education Planning and Promotion**.

732. **Evaluation of Health Education Programs**.

740. **Evaluation of Health Education Programs**.

* 798. **Nondissertation Research**.

* 799. **Dissertation Research**. Prerequisite: Admission to candidacy.

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. **MechanicalAnalysis of Motor Skills**. Application of principles of physics to human movement. Analysis through videotape and cinematography techniques. Prerequisite: PE 307.

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**.

651. **Issues and Problems in Coaching**.

652. **Measurement and Evaluation of Athletes**.

655. **Motor Learning**. Factors influencing learning and performance of motor skills.

656. **Advanced Sport Psychology**. Relationship of psychology to sports performance.

672. **Advanced Treatment of Athletic Injuries**. Seminar and practical experience. Conducted by certified trainers at UAB Sports Medicine Clinic.

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**.

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**.

Counseling Specializations

Counselor Education

Admission to graduate study in counseling will occur three times per year, and the completed packet of materials must have been received in the Department of Human Studies from the Graduate School by the dates shown:

Term	*Deadline*
Fall	July 1st
Spring	October 1st
Summer	April 1st

In addition to the transcripts and test scores required by the Graduate School, the file must include a statement of the applicant's goals or purposes to be accomplished by completing the program; an interview may also be required as a part of the admissions process. Admission is competitive and limited. Selection will be made by the counseling faculty after reviewing the applicant's credentials in their entirety, and some candidates meeting minimum requirements may not be admitted.

Evaluation of Candidates

Master's Level: Evaluation of student counselor is an on-going process. The faculty reserves the right to determine candidate's appropriateness as a professional. A comprehensive examination will be given upon completion of Area I and Area II. Students who do not successfully pass this examination will be given the opportunity to take the exam. Students unsuccessful in passing the comprehensive exam will be dismissed from the program. In addition, students must have demonstrated specific competencies in Area II (specifically ECG 638 and ECG 626) as evidenced by faculty approval in order to proceed in the program. This demonstrated competency is in addition to the grade received in the course.

Ed.S. Level: Students in the Ed.S. program will compile a professional portfolio and will make formal presentation of the portfolio to the faculty.

Clinicals

Prerequisites for the clinical experience include successful completion of required coursework, successful completion of comprehensive exams, and demonstration of required competencies in Areas I and II. The practicum experience requires a minimum of 100 hours on-site in an agency, school, or rehabilitation setting. The internship is 600 hours on-site. Grading for the clinical is on a Pass/Fail basis. To receive a Pass grade the student must attain a B or better. **If a student fails to pass any portion 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.

School Counseling

This specialization 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.

The Educational Specialist (Ed.S.) degree in this field requires a minimum of 33 semester hours of prescribed coursework beyond the Master of Arts in Education degree and a terminal research project. This specialization meets the academic and field experience requirements for the SDE Class AA Professional Certificate in school counseling.

Community Counseling

The two specializations outlined below are intended to prepare graduates to work in agency and mental health settings and lead to recommendation by the department for licensure as a Licensed Professional Counselor (LPC). Applicants to these counseling specializations should carefully identify the counseling role they intend to fulfill and choose the appropriate training.

Agency Counseling

Designed to meet the needs of individuals interested in working as counselors in various community agencies, including private practice as LPC. The agency counseling specialization for the Master of Arts in Counseling degree requires 49 semester hours of planned course work. If Plan I is followed, up to 6 semester hours of thesis research credit are allowed. The program leading to the Ed.S. degree with the agency counseling major requires a minimum of 33 semester

hours of planned coursework beyond the master's degree and a terminal research project.

Rehabilitation Counseling

Designed to prepare individuals to work as a rehabilitation counselor in private practice or public agencies with physically, mentally, and socially impaired persons. The Master of Arts in Counseling degree with this specialization requires a minimum of 49 semester hours of planned coursework and field experiences. The content of the specialization meets the academic requirements for LPC and Certified Rehabilitation Counselor (CRC). Students who wish to go beyond the rehabilitation counseling master's degree may continue toward the Ed.S. degree in agency counseling.

School Psychometry

The M.A. Ed. specialization is designed to train individuals to work as psychometrists in public schools. The program requires a minimum of 45 semester hours of planned coursework and field experiences, to include a one-term, full-time internship. This program also meets the requirements for the SDE class A Professional Certificate in school psychometry.

School Psychology

This Ed.S. specialization prepares graduates to function as school psychologists in public and private schools. The program requires a minimum of 33 semester hours of planned study beyond the M.A. degree, a terminal research project, and a one-term, full-time internship. This program meets the SDE requirements for the Class AA Professional Certificate in school psychology.

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.

Counseling and Guidance (ECG)

522. **Strategies for Attitude Development**. Dynamics of both negative and positive attitudes. Methods for improving communications, developing empathy. Techniques for determining personal strengths, setting goals, managing time, developing strong positive attitudes and self-images.

523. **Strategies for Effective Interviewing**.

524. **Conflict Management**.

540. **Introduction to Rehabilitation**. Introduction and overview of rehabilitation process.

570, 670. **Crisis Intervention Techniques**. Overview of crisis counseling. Theory and practical application of crisis intervention.

574, 674. **Seminar on Death, Dying, and Bereavement**. Provides general knowledge of death, dying, and bereavement issues faced in today's society.

578. **Counseling the African American Client**. Dynamics of working with African American clients in counseling settings. Prerequisite: Admission to the Counseling Education Program.

612. **Professional, Ethical, and Legal Issues in Counseling**. Emphasis on understanding of professional roles and responsibilities; ethical and legal issues; historical perspectives; preparation standards; credentialing; trends and issues in the counseling profession.

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 and Administration of Counseling Services in the Schools**. Social, psychological, economic, and philosophic trends leading to development of guidance programs in American schools. Organization and administration of guidance services.

621. **Prepracticum: Theories and Techniques in Individual Counseling**. Educational, vocational, and personal counseling. Observations and simulations.

623. **Comprehensive Counseling and Guidance in Middle and High School**. Offers an understanding of the nature of middle and high school children as related to their guidance and counseling needs. Identification of the developmental needs, problems, and issues of adolescents (ages 13-18). Identification, development, and practice of counselor interventions in individual counseling, small group counseling, large group guidance, peer facilitator training, consultation, and program coordination.

624. **Assessment in Counseling**. Using standardized tests in schools and related agencies. Prerequisites: 3 hours of statistics.

626. **Theories and Processes of Group Counseling**. Guidance and counseling in small groups. Prerequisites: ECG 621 and 638 or permission of instructor.

627. **Counseling in Elementary School**. Guidance services and activities appropriate for preschool and elementary grades; facilitating intellectual, psychological, and social development during early school years.

628. **Societal Issues in Counseling**. 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.

630. **Career Development: Theory and Research**. Career choice; theories of career development, vocational testing, and research.

631. **Interpersonal Dynamics in Small Groups**. Experiential group designed to increase understanding of interpersonal dynamics in small groups. Prerequisite: Permission of instructor.

632. **Technology for Counselors: Case Management and Report Writing**. Emphasis on using specialized software to enhance clinical report writing: intake interviews, diagnostic workups, psychological evaluation, assessments, psychosocial narratives and histories, treatment plans, progress notes, and genorgrams. Practice management programs are highlighted.

635. **Medical Information for Counselors**. Medical information, terminology, body systems, and vocational implications of disability; application to problems of disabled clients.

636. **Psychological and Sociological Aspects of Rehabilitation Counseling**. Psychological aspects of disabilities and sociological reactions to disabled persons. Rehabilitation counseling. Psychological aspects of disabilities and sociological reactions to disabled persons. Rehabilitation process and psychological adjustment within world of work.

637. **Adlerian Family Counseling**. Helping parents understand children. Parent-child relationship promoting responsibility, self-reliance, cooperation, mutual respect, and self-esteem.

638. **Practicum I: Introduction to the Counseling Process**. Skills and techniques for establishing effective interpersonal relationships. Prerequisite: ECG 621.

648. **Case Management Process in Rehabilitation**. Principles and processes of case management as outlined by State Department of Vocational Rehabilitation in case service manual.

650. **Counseling the Client Who is Psychologically Impaired**. Limitations placed by certain psychiatric disorders on counseling and adjustment therapy; case management, vocational placement and stability, and family and other

interpersonal relationships. Prerequisite: Course in personality theory, individual and group counseling, abnormal psychology, or advanced human development.

660. **Dynamics of Child Sexual Abuse**. Critical concerns and issues, effective techniques and practices.

673. **Counseling Needs of Women**. Women's development and needs; problems women bring to counselors and strategies for helping them; myths about women; and biases in psychological research.

691. **Seminar: Special Topics in the Helping Professions**. Emerging trends, techniques, and issues. Prerequisite: Permission of instructor. 1-3 hours.

* 692. **Independent Readings in Counselor Education**. Prerequisite: Permission of advisor and instructor. May be repeated for total of 6 hours. 1-3 hours.

695. **Practicum II: Supervised Field Experience**. A 100-hour-minimum field placement in an agency school or rehabilitation setting. Focus is on developing counseling competencies. Prerequisite: Completion of Areas I and II, and comprehensive exams; permission of clinical coordinator.

697. **Counseling Internship**. Field experience in setting appropriate to student's program; participation in activities of school or agency counseling services, within constraints of ethical practice. 3 hours for 2 terms (600 clock hours).

698. **Individual Nonthesis Research in Counseling and Guidance**. Prerequisite: Permission of instructor.

726. **Ed.S. Group Supervision**.

795. **Ed.S. Practicum Supervision**. Experiential course in which Ed.S. students are assigned to assist in master's level practicum groups in the Counseling Education program. Applied knowledge of counseling supervision theories. Prerequisite: ECG 704.

797. **Ed.S. Internship Supervision**. An experiential course in which Ed.S. students are assigned to provide supervision under faculty direction to a section of the master's level internship. Applied knowledge of supervision theories and practices are highlighted. Prerequisites: ECG 704 and 795.

Education Psychology (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.

596. **Introduction to Qualitative Methods in Educational Research**. Qualitative research methods and techniques; their application to qualitative research design. Introduction to types of qualitative information, methods of data collection and analysis, and presentation of results; appropriateness of qualitative design. Prerequisite: EPR 692 or equivalent.

600. **Introduction to School Psychology**. Overview of professional practices and crucial issues in school psychology.

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.

609. **Statistical Methods and Research in Education: Intermediate**. Basic inferential techniques including hypothesis testing, parametric and nonparametric techniques. Assumptions, rationale, and interpretation of analysis of variance techniques. Prerequisites EPR 607 and EPR 608 or basic statistics course.

610. **Child Psychology**. Human development through infancy, preschool, and preadolescence.

611. **Adolescent Psychology**. Social, emotional, and cultural aspects of adolescence affecting classroom and school behavior.

614. **Lifespan Human Development**. Social-emotional, intellectual-language, and physical-motor development from conception to old age. Prerequisite: General psychology.

616. **Personality Theories for the Helping Professions**. Prerequisites: 3 hours of general psychology and 3 hours of graduate educational psychology or human development.

622. **Learning Theories**. Application to educational practice. Behavioral theories, information processing, biochemical basis of memory and learning.

627. **Individual Testing in Guidance III (K-ABC)**. Administration, scoring, interpretation, and use of Kaufman Assessment Battery for Children (K-ABC). Prerequisite: EPR 629 and permission of instructor.

628. **Individual Testing in Guidance I (Stanford-Binet)**. Administration, interpretation, and use of Stanford-Binet intelligence scale. Prerequisite: Permission of instructor.

629. **Individual Testing in Guidance II (Wechsler Scales)**. Administration, interpretation, and use of Wechsler intelligence scales. Prerequisite: Permission of instructor.

630. **Clinical Assessment in Education**. Individual intelligence, personality, and projective tests used by school psychologists. Prerequisite: Permission of program coordinator.

688. **Seminar on Current Issues in Measurement and Evaluation in Schools**. Issues of standardized testing and classroom assessment for teachers and administrators.

689. **Internship and Seminar in School Psychology I**. Daily, one-semester participatory experience in school setting supervised by certified school psychometrist. Prerequisite: Completion of school psychometry major. 6 hours.

* 691. **Independent Readings in Educational Psychology and Research**. Prerequisites: Permission of advisor and instructor. May be repeated for total of 6 hours. 1-3 hours.

692. **Introduction to Educational Research Design**. Literature of educational research. Rationale of library and empirical research. Research on current educational issues. Prerequisite: EPR 608.

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 488. 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.

Counselor Education

The graduate programs in counseling are designed to train students to make appropriate and ethical decisions as counseling professionals. The most important of these decisions is the selection of strategies that empower clients to make personal decisions leading to the resolution of problems and resulting in an improved quality of life. Clients represent the multicultural, multiethnic, and multivalues character of a diverse American society. Thus, counselors must understand human behavior in terms of its psychological, physiological, and sociological influences and make professional decisions within the legal and ethical constraints that are applicable.

Students in the counseling programs in the department are encouraged, aided, and expected to perceive themselves as professionals who work closely and cooperatively with other professionals, such as those in public and private school systems, colleges and universities, community and private programs and agencies, and government service agencies. Professionalism in this context means that students are aware of their own knowledge and skill levels, abilities, characteristics, and perspectives, and the respective limits thereof, and that they behave in accordance with the highest ethical and professional standards. Students are expected to demonstrate acquired knowledge and skills throughout the program. Through feedback and self-exploration, students will gain a better understanding of their responsibilities as counselors.

All counseling programs (agency, rehabilitation, school) are designed to meet the course-work and field experiences requirements outlined in the accreditation standards of the Council for Accreditation of Counseling and Related Educational

Programs (CACREP). In addition, the rehabilitation counseling specialty area meets the Council on Rehabilitation Education (CORE) certification requirements. The school counseling program meets the course work and field experiences required by the Alabama State Department of Education for certification. All programs meet the academic requirements for licensure as professional counselors in Alabama. As a program strength, the faculty who teach the counseling theory and skills courses are professional counselors who participate in limited practice in their specialty areas.

Agency Counseling Specialty

The role of professional counseling has become increasingly important as an effective source of personal assistance in dealing with a myriad of problems in a complex society. The counseling profession is alive with ideas and techniques based on developmental and behavioral theory and has established a rightful place among the helping professions. Counseling has a serious contribution to make toward the psychological, social, and physical well-being of members of the community. We welcome the interest and inquiry of persons who feel a dedication to helping others and who will commit to serious study of the theory, techniques, and related course work on which professional counseling practice is based.

The Master of Arts in Community 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.

Area I: Precandidacy Requirements (28 semester hours)

EPR 607	Microcomputer Applications to Statistical Analysis
EPR 608	Statistical Methods and Action Research
ECG 612	Professional, Ethical, and Legal Issues in Counseling
EPR 614	Life-Span Human Development
ECG 621	Prepracticum: Theories and Techniques of Individual Counseling
ECG 638	Practicum I: Introduction to the Counseling Process. Prerequisite: ECG 621
ECG 624	Assessment in Counseling. Prerequisites: ECG 607 and ECG 608
ECG 626	Theories and Processes of Group Counseling. Prerequisites: ECG 621 and ECG 638
ECG 628	Societal Issues
ECG 630	Career Development: Theory and Research

Comprehensive examinations may be taken upon completion of Area I.

Area II: Precandidacy Courses (12 semester hours)

ECG 622	Group/Classroom Guidance in Schools (Prerequisite ECG 620)
ECG 623	Comprehensive Counseling and Guidance in the Middle/High School
ECG 619	Special Issues for School Counselors
ECG 627	Comprehensive Counseling and Guidance in the Elementary School

Admission to Candidacy–Completion of Areas I and II; passing qualifying examinations (comprehensive exams): and recommendation of faculty

Area III: Postcandidacy Requirements (9 semester hours)

ECG 695	Practicum II: Supervised Field Experience (Prerequisite Areas I & II; comps, approval of faculty)
ECG 697a	Counseling Internship* (Prerequisite: ECG 695)
ECG 697b	Counseling Internship* (second term)

* Current societal standards require 600 clock hours of supervised internship to include experiences at both elementary and secondary levels. ECG 697 may be repeated for up to 9 semester hours (200 clock hours per semester), which will extend program requirements to 51 semester hours.)

Note: School Counseling Internship sites are very limited during summer terms.

Note: Special Education requirement must be met.

Educational Specialist in Community Counseling (Agency/Rehabilitation)

The Educational Specialist (Ed.S.) degree is designed to assist counselors who wish to continue their professional development. Students can choose either a clinical or research track of study. Prerequisites for admission to the program: a Master's degree in counseling, including the following courses or their equivalent:

ECG 650>	Counseling the Psychologically Impaired Client
ECG 607	Microcomputer Applications to Statistical Analysis
ECG 608	Statistical Methods in Research and Education
ECG 626	Theories and Processes of Group Guidance
EPR 614 >	Lifespan Human Development
EPR 616	Personality Theories

Students should meet with their advisor and discuss their professional plans before declaring a track of study. **All students will complete Area I, Core Area of Study.** In Area II, students and their advisor will map out a plan of study based on the professional needs of the student.

Area I: Counseling Core Area of Study (24 Semester Hours)

EPR 609	Statistical Methods and Research in Education: Intermediate >
EPR 692	Introduction to Educational Research Design
ECG 691	Seminar on Special Topics: Teaching in Higher Education
ECG 704	Seminar on Current Issues in Counseling Supervision
ECG726	Application of Small Group Theory
ECG 795	Ed.S. Practicum
ECG797	Ed.S. Internship (6 hours)

Area II: Clinical or Research Track (9 Semester Hours)

Research Track: Students interested in research and/or interested in pursuing a doctorate should consider the research track of study.

EPR 696	Qualitative Research: Inquiry and Analysis
EPR 710	Computer Applications and Advanced Statistical Methods
ECG 699	Individual Thesis Research in Counseling

Clinical Track: This course of study is designed to enhance one's clinical practice. Students may select courses that meet their unique needs and/or interests. There may be options of study outside the Counselor Education Program, such as the Gerontology Certificate Program (15 hours). Other examples might include areas of study in Health Education and Promotion, or other specially designed options.

ECG 632	Technology for Counselors: Case Management and Report Writing
ECG 637	Adlerian Family Counseling
ECG 660	Dynamics of Child Sexual Abuse
ECG 670	Crisis Intervention Techniques
ECG 673	Counseling Needs of Women
ECG 674	Seminar on Death, Dying, and Bereavement
ECG 691	Seminar on Special Topics: Play Therapy I
ECG 691B	Seminar on Special Topics: Sign Language
ECG 691C	Seminar on Special Topics: Preparation for the NBCC Exam
ECG 691D	Seminar on Special Topics: Play Therapy II

Proposed Courses Pending

ECG	Counseling Families in a Multicultural Society
ECG	Seminar in Chemical Dependency
ECG	Family Counseling: Theories and Techniques
ECG	Nontraditional Lifestyles
ECG	Creative Counseling Techniques

Comprehensive Examination

Upon completion of the requisite course work, students are required to pass an oral examination, conducted by Counselor Education Faculty, to complete the Ed.S. degree.

Educational Specialist in School Counseling

The Educational Specialist (Ed.S.) degree is 36-hour program, designed to assist school counselors who wish to continue their professional and academic development. Obtaining an Ed.S. degree will qualify the student to receive an AA Certificate from the Department of Education. The Ed.S. degree requires the student to participate in a research and clinical (internship) track of study. Prerequisites for admission to the Ed.S. program in School Counseling are a master's degree in school counseling, admittance to the Graduate School, and participation in a formal application process to the Counselor Education Program.

A student's master's degree must have the following courses or their equivalent:

ECG 607	Microcomputer Applications to Statistical Analysis
ECG 608	Statistical Methods in Research and Education
ECG 626	Theories and Processes of Group Guidance
EPR 614	Lifespan Human Development
ECG 620	Foundations and Administration of Guidance Services

Special Education

Students should meet with their advisor and discuss their professional plans **before** enrolling in classes.

Foundations of Professional Studies

Six (6) semester hours from the following courses are required:

EPR 610	Child Psychology
EPR 611	Adolescent Psychology
EPR 616	Personality Theory for Helping Professionals
EPR 622	Learning Theories

EDF 602 American School in Crisis
ECY 600 Introduction into Special Education
ECG 660 Dynamics of Child Sexual Abuse
ECG 670 Crisis Intervention Techniques

Instructional Support

Fifteen (15) semester hours from the following courses are required:

ECG 704 Seminar on Current Issues in Counseling Supervision
ECG 726 Application of Small Group Theory
ECG 795 Ed.S. Practicum

Research

Six (6) semester hours are required:

EPR 609 Statistical Methods & Research in Education: Intermediate
EPR 692 Introduction into Research Design

Instructor-approved Electives

Six (6) semester hours are required.

Internship, 300 Hours

ECO 797 Three (3) semester hours are required.

Course Electives

ECG 637 Adlerian Family Counseling
ECG 698 Individual Nonthesis Research in Counseling and Guidance
EGG 692 Independent Readings in Counselor Education
ECG 691 Special Issues for School Counselors
ECG 623 Comprehensive Counseling & Guidance in the Middle/High School
ECG 627 Comprehensive Counseling & Guidance in the Elementary School
ECG 622 Group/Classroom Guidance in Schools
EGG 673 Counseling Needs of Women
ECG 674 Seminar on Death, Dying, and Bereavement
ECG 691 Seminar on Special Topics: Teaching in Higher Education
EGG 691 Seminar on Special Topics: Play Therapy I
ECG 691 Seminar on Special Topics: Sign Language
EGG 691 Seminar on Special Topics: Preparation for the NBCC Exam
ECG 691 Seminar on Special Topics: Play Therapy II

EGG 691	Seminar on Special Topics: Adventure-based Counseling
EDL 704	Educational Law and Policy Development
ECG 522	Strategies for Attitude Adjustment

Proposed Electives: Pending

EGG	Counseling Families in a Multicultural Society
EGG	Seminar in Chemical Dependency
ECG	Family Counseling: Theories and Techniques
ECG	Nontraditional Lifestyles
EGG	Creative Counseling Techniques

Comprehensive Examination (Counseling)

The written comprehensive examination is an important screening review for the student after the completing Area I. The successful completion of the qualifying examination is prerequisite to admission to candidacy for the degree. The comprehensive is an examination that is broad in scope and requires the student to synthesize and apply concepts learned from relevant course work.

*Note: Although students are required to complete all of the classes in Area I, exceptions can be made if a student has completed **all but one** class and is enrolled in that class at the time of taking comprehensives.

Should a student not successfully pass the examination, he or she must rewrite the exam on the next scheduled date for the comprehensive examination. The comprehensive examination can be retaken a maximum of two times. If a student fails to successfully pass the comprehensive examination, he or she will be terminated from the program. Comprehensive examinations are scheduled for fall, spring, and summer semesters. The comprehensive examination should be scheduled at the time a student has met all the requirements of Precandidacy for Area I.

Education—Leadership, Special Education, Foundations and Technology (M.A.E.)

Educational Leadership (Ph.D., Ed.D., Ed.S., M.A.Ed.)

Education, Special (Ed.S., M.A.Ed.)

Graduate program director at UAB: *Dr. Lou Anne Worthington*

UAB Faculty

Carol Allison, Instructor (Special Education); Visual Impairments

Loucrecia Collins, Associate Professor (Leadership); Curriculum, Conflict Resolution

Karen Dahle, AssociateProfessor (Special Education); Special Education Administration and Supervision, School Psychology, Autism, Counseling

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

Jennifer Kilgo, Professor (Special Education); Early Childhood

Tondra Loder-Jackson, Assistant Professor (Foundations); Urban Education, Confluence of Generation, Race & Gender; African American Education pre- & post-Brown, Life History & Life Course of Educators

Andrew McKnight, Assistant Professor (Foundations); Philosophy of Education, social Justice in Education, Emotional Contexts in Education, Qualitative Interpretive Inquiry

Betty Nelson, Associate Professor (Special Education); Low-Incidence and High-Incidence Disabilities, Assistive Technology, Collaboration in Schools

Jerry L. Patterson, Professor (Leadership); Educational Leadership, Organizational Change, Supervision

Mary Jean Sanspree, Research Professor (Special Education); Visual Impairments, Alabama Deaf-Blind Project

Linda Searby, Assistant Professor (Leadership)

George Theodore, Assistant Professor (Leadership)

Deborah Voltz, Associate Professor (Special Education); Learning Disabilities, Urban Education

Yu-Mei Wang, Associate Professor, (Technology)

Lou Anne Worthington, Associate Professor (Special Education); Emotional and Behavioral Disorders, Collaborative Teaching, Special Education Law

Educational Leadership Graduate Programs Information

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.

The programs leading to the Doctor of Education (Ed.D.) and Doctor of Philosophy (Ph.D.) degrees 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; application packets must be complete in the Graduate School office by **November** for the program of study beginning the following January (spring term).

Additional Information

For detailed information, contact Dr. Lou Anne Worthington, Program Director, Department of Leadership, Special Education and Foundations, UAB School of Education, EB 246A, 1530 3rd Avenue South, Birmingham, AL 35294-1250.

Telephone 205-975-5976

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

Web **www.ed.uab.edu**

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)

611. **School Organization and Law**. Survey of selected theoretical and operational bases for decision making and leadership in organizational development and maintenance services for effective operation of schools. Legal framework established by local, state, and federal legislative and judicial requirements.

612. **Leadership and Administration**. Survey of selected theoretical and operational bases for decision making related to leadership, communication, and school-community relations. Prerequisite: EDL 611.

613. **Supervision and Curriculum Development**. Survey of selected theoretical and operational bases for decision making and leadership in curriculum, teaching, and learning. Prerequisites: EDL 611 and 612.

614. **Planning for Change**. Survey of selected theoretical and operational bases for decision making in problem identification and analysis, staff development, and assessment and evaluation of human and program effectiveness in grades N-12. Prerequisites: EDL 611, 612, and 613.

615. **Nonthesis Research in Educational Leadership**. Prerequisite: 12 hours in educational leadership.

617. **Politics of Education**. Education leaders learning to take action within the complex maze of political relations within schools, between school and their communities, and within levels of government. Prerequisite: Admission to master's program in educational leadership or approval by instructor.

618. **Ethics and Leadership**. An examination of ethical issues and dimensions of ethical decision making. Prerequisite: Prerequisite: Admission to master's program in educational leadership or approval by instructor.

619. **School-Based Problem Solving**. An analysis and application of techniques for school-based problem solving. Prerequisite: Admission to master's program in educational leadership or approval by instructor.

620. **Public School Organization and Administration** .

621. **The School Principalship**. Changing role and responsibilities of school principal; organization, discipline, instructional supervision, and community relations.

622. **Clinical Supervision for Administrators and Supervisors**. Knowledge, skills, and competencies for assisting teachers in improvement of curriculum and instruction.

625. **Education Management**. An overview of education management techniques for the improvement of the education enterprise and student learning. Prerequisite: Admission to master's program in educational leadership or approval by instructor.

630. **School and Community** .

631. **Education and the Political Environment**. Educational policy making and governance as political process; political theory and structure.

635. **Survey of School Law**. Laws and court decisions affecting public education. Cases establishing mandates for public school practices.

637. **Legal Liability and the Educator**. Legal liability in administration and teaching. Cases pertaining to education.

640. **Introduction to Community Education**. Structure, purpose, and processes of community education and community schools.

641. **Community Education for School Administrators**.

642. **Operation and Administration of the Community Education Program**. Practical aspect.

643. **Community Resources Workshop**. Teaching-learning resources available in the local community.

660. **Administration Leadership I .** Practical applications in organizational management and leadership behavior.

685. **Workshop in Administration and/or Supervision**. Field workshop. 1-3 hours.

690. **Internship in Educational Leadership**. Field leadership experience; minimum of 300 clock hours of field experience in administration under direction of both field supervisor and university director. Prerequisite: Permission from director of internships. 1-6 hours.

691. **Practicum in Educational Leadership**. Field work on practical problem on project. Prerequisite: 9 hours in educational leadership at UAB. 3-6 hours.

692. **Individual Readings in Educational Leadership**. Prerequisite: Permission of instructor. 1, 3, 6 hours.

694. **Seminar in Educational Leadership I . 1-3 hours.**

695. **Seminar in Community Education**. 1-3 hours.

696. **Practicum in Community Education**. 3-6 hours.

* 698. **Nonthesis Research in Education Leadership**. 1, 3, or 6 hours.

* 699. **Thesis Research**. Prerequisites: Admission to candidacy and 9 hours in educational leadership.

701. **Organizational Leadership and Decision Making I . Knowledge and skills related to educational leadership.**

702. **Organizational Leadership and Decision Making II**. Knowledge and skills related to educational leadership.

703. **Theories and Practices for Supervision Leadership**.

704. **Education Law and Policy Development**.

705. **The Management of Educational Programs and Services**.

706. **Current Issues in Community Education**.

707. **International Aspects of Community Education**. Comparative analysis of community education worldwide.

708. **Administrative Leadership II**. Concepts and skills applied to educational administration and supervision.

709. **Theories of Educational Leadership**. Concepts and theoretical bases for practice in educational administration and supervision.

710. **Mentoring for Educational Leadership**. Preparing educational practitioners to become effective mentors for aspiring future leaders.

712**. School System Administration**.

713. **Leadership of Special Education Programs**. 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**.

715. **Nonthesis Research in Educational Leadership**. 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 hours.

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.

721. **Administration of Staff Personnel**. Personnel administration in public education; practices, problems, and current developments.

722. **Current Issues in Educational Leadership**. Prerequisites: Graduate standing and permission of instructor.

723. **Administration of Educational Programs and Services**. Development, implementation, and evaluation of educational programs. Primarily for Ed.S. students continuing their preparation principalship.

724. **Seminar in Educational Leadership II**. 1-3 hours.

726. **Advanced Clinical Supervision for Administrators and Supervisors**. In-depth study of competence needed by administrators and supervisors providing leadership in improvement of instruction.

729. **Advanced Research in Educational Leadership**. Field or basic research. 1, 3, or 6 hours.

730. **Advanced Focus on the Principalship**. Advanced knowledge and skills related to school leadership.

748. **Current Issues and Problems in School Administration**. Prerequisite: Admission to doctoral studies.

750. **Issues and Problems in School Finance**.

752. **Advanced Educational Planning**.

755. **Advanced School System Administration**. Duties and responsibilities of superintendent of schools. Prerequisite: Admission to doctoral studies.

756. **Current Legal Problems in Alabama Education**. Prerequisite: Admission to doctoral studies.

762. **Futurism in Community Education**. Predicting and planning; what others say about future; developing personal predictions. Prerequisite: Admission to doctoral studies.

770. **Advanced Administrative Leadership**.

772. **Advanced Technology of Educational Planning**. Quantitative techniques. Prerequisite: Admission to doctoral studies.

792. **Directed Study in Educational Leadership**. Prerequisites: Admission to doctoral studies and advance permission of instructor. 3 hours.

796. **Individual Readings in School Law**. Prerequisite: Admission to doctoral studies. 3-6 hours.

797. **Doctoral Internship in Educational Leadership**. Field leadership experience. Prerequisite: Admission to doctoral studies. 1-12 hours.

* 798. **Nondissertation Research**. Prerequisite: Admission to doctoral studies. 1-12 hours.

* 799. **Dissertation Research**. Prerequisites: Prerequisite: Admission to doctoral studies, admission to candidacy, and permission of faculty advisor. 1-12 hours.

University of Alabama (Tuscaloosa) Courses Offered at UAB in the Joint Doctoral Program in Educational Leadership

AEL 590. **Research Methods in Education**. Library familiarization, types of research, measurement, data collection, and basic statistical analysis.

AEL 602. **Advanced Educational Leadership**. Basic concepts, group interaction on selected presentation of assigned research.

AAP 634. **Legal Aspects of Personnel Administration.** Principles governing personnel management in public school systems.

AEL 651. **Educational Planning II.** Processes, concepts, and tools.

Educational Collaborative Teacher (ECT)

601. **Special Education Portfolio Process** (1 credit hour). This course is designed to provide 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**. This is 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**. This course is 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**. This course 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**. This course 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**. The emphasis of this course is on 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**. This course 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-Oncidence Disabilities**. This course 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**. This course is designed to provide 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**. This course is designed to prepare 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**. This course is designed to prepare 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**. This course is designed to prepare 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**. This course is intended to provide 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**. This course 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**. This course is designed to provide 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**. This course presents 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**. The purpose of this course is to provide 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.

Exceptional Children and Youth (ECY)

600. **Introduction to Exceptional Learners**. This course provides 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 reviewd 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. Prerequisite: ECY 600.

635. **Early Development and Intervention in ECSE**. An introductory course designed to provide an 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. 3 hours.

636. **Instructional Methods for Infants and Preschoolers with Disabilities**. This course covers 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. 3 hours.

637. **Assessment of Young Children with Disabilities**. This course addresses 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. 3 hours.

638. **Motor and Health Care Needs of Young Children with Disabilities**. This course focuses on 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. 3 hours.

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 deafblind. 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 deafblind. Prerequisites: ECY 600, 661, and 662.

664. **Braille**. Principles of teaching reading, transcribing and writing Braille; tests, curricula and technolgy 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 deafblind; Prerequisites: ECY 600, 661, 663, and 664.

686. **Practicum Visual Impairments**. Clinical experiences with persons who are blind, visually impaired or deafblind 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**. This course is designed to provide 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. 3 hours.

672. **Internship in ECSE**. This course is designed to provide 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. 3 hours.

689. **Advanced Topics in Special Education**. This course is 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.

Educational Foundations (EDF)

362. **Foundations of Education I: Social, Historical, and Philosophical**. An examination of the historical, social, philosophical, and comparative foundations of contemporary American education.

600. **Urban Education**. An examination of the historical, social, political, and economic factors that shape urban education in America.

601. **The History of 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.

602. **Critical Social Issues in American Education**. An examination of contemporary social issues facing American schools. from politics and policy, school strcuture, and curriculum to pedagogical practice. The relationship of the school to society is also addressed.

603. **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.

604. **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.

606. **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.

608. **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.

616. **Comparative Education**. An examination of the cultural forces influencing the structure and function of education in selected countries.

620. **Culture and American Education: Race, Class, and Gender**. An examination of the interlocking influences and socially constructed meanings and understanding of culture, race, ethnicity, class, and gender in American education.

624. **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.

697. **Individual Readings in Foundations of Education**. Prerequisite: Permission of instructor. 1-3 hours.

698. **Individual Nonthesis Research in Foundations of Education**. Prerequisite: Permission of instructor. 1-3 hours.

703. **Selected Topics in Educational Philosophy**. A topical advanced seminar in the philosophy of education.

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.

708. **Ethic Dilemmas in Educational Administration**. Relationships among disciplines; application of concepts in individual disciplines to interdisciplinary problems. Prerequisite: Ed.S. or doctoral status.

710. **Special Problems in the Foundations of Education**. Individual readings. Prerequisites: Master's degree and permission of advisor and educational foundations faculty member.

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.

713. **History of Educational Philosophy**. A historical sequenced survey of educational philosophy from the ancient Greeks, 18th century enlightenment thought, American pragmatism, and existentialism to postmodernism.

716. **Comparative Education**. Prerequisite: Ed.S. or doctoral status.

720. **Culture and American Education: Race, Class, and Gender**. An examination of the interlocking influences and socially constructed meanings and understanding of culture, race, ethnicity, class, and gender in American education.

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.

797. **Independent Study**. Independent readings under the direction and supervision of EDF faculty. Doctoral status and the permission of the instructor are required.

Educational Technology (EDT)

610. **Computer-Based Instructional Technologies**. The first course in a series of three to familiarize classroom teachers with computer-based instruction technologies as they are applied to educational settings. Students are introduced to the historical and social context within which computer technologies are developed, as well as to the knowledge of computer hardware and software. Students will learn basic skills of microcomputer operation and applications.

620. **Current and Emerging Instructional Technologies**. The second course in a three-course series designed to provide inservice teachers with knowledge and skills in the use of computing and other new technologies. Prerequisite: EDT 610.

630. **Curriculum Integration of Technology**. This is the third course in a three-course series designed to provide inservice teachers with knowledge and skills in the use of computing and other new technologies. Prerequisites: EDT 610 and 620.

640. **Instructional Design and Technology**. This course introduces students to the principles of instructional design. Students will be familiarized with the process of instructional design and various design models. The role of technology in instructional design will also be covered.

641. **Instructional Multimedia Authoring**. This course teaches students skills for advanced multimedia development. The topics include digital audio and digital video production, CD and DVD creation, multimedia authoring tools, and streaming technologies.

650. **Learning, Cognition, and Technology**. This course examines the relationship between learning theories and technology. Students will explore the role of technology in supporting various aspects of the learning process and the use of learning theories as a guide to implement technology in educational contexts.

660. **E-Learning**. This course focuses on e-learning environments. Students will develop the knowledge and skill to design effective e-learning environments and explore conceptual frameworks, various e-learning tools, and strategies.

ENGINEERING

Biomedical Engineering (Ph.D., M.S.B.M.E.)

Degree Offered:	Ph.D., M.S.B.M.E.
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Faculty

N. Shastry Akella, Research Assistant Professor, (Biomedical Engineering); Medical Imgaing, Neuroimaging, Neuro-oncological Imaging

Andreas Anayiotos, Associate Professor, (Biomedical Engineering); Biofluids, Dynamics of the Vascular System

Allan C. Dobbins, Associate Professor, (Biomedical Engineering); Human and Machine Vision, Neural Computation, Brain Imaging, Scientific Visualization

Alan Eberhardt, Associate Professor, (Biomedical Engineering); Solid Mechanics, Analytical and Numerical Methods in Biomechanics

Vladimir G. Fast, Associate Professor, (Biomedical Engineering); Cardiac Electrophysiology

Dale S. Feldman, Associate Professor, (Biomedical Engineering); Biomaterials, Soft-Tissue Biomechanics, Polymeric Implants

Paul D. George, Assistant Professor (Biomedical Engineering) and Director of Career Services for Engineering

Richard A. Gray, Associate Professor, (Biomedical Engineering); Optical Mapping of Re-Entry Fibrillation and Defibrillation

Ho-Wook Jun, Assistant Professor, (Biomedical Engineering); Biomimetic Nanotechnology, Biomaterials, Tissue Engineering

Jack E. Lemons, Professor, (Biomedical Engineering); Biological Tissue Reaction to Synthetic Materials, Biomechanics

W. David Merryman, Assistant Professor (Biomedical Engineering); Cardiovascular Mechanobiology, Experimental Biomechanics, Tissue Engineering, Biomedical Engineering Ethics

Andrew E. Pollard, Professor, (Biomedical Engineering); Simulation and Modeling of Electrical Signals of the Heart

Jack M. Rogers, Associate Professor, (Biomedical Engineering); Computer Simulations of Re-Entry, Signal Analysis of Cardiac Arrhythmias

William M. Smith, Professor Emeritus, (Cardiovascular Disease); Bioinstrumentation, Multichannel Cardiac Mapping, ECG Mapping and Signal Analysis

Yuhua Song, Assistant Professor, (Biomedical Engineering); Computational Biomechanics, Computational Biology, Multiscale Modeling

Donald B. Twieg, Professor, (Biomedical Engineering); Medical Imaging, Magnetic Resonance Imaging (MRI) Techniques, Functional MRI of Brain and Heart

Timothy M. Wick, Professor and Chair, (Biomedical Engineering); Tissue Engineering, Regenerative Medicine, Bioreactors, Cell Adhesion

Xincheng Yao, Assistant Professor, (Biomedical Engineering); Optical Imaging of Neural Function, Optical Coherence Tomography (OCT)

Secondary Faculty

Rigoberto Advincula, Assistant Professor, (Natural Science and Math); Polymer Synthesis

Franklin Amthor, Professor, (Psychology); Neurophysiology of Vision Computer Graphics

Susan L. Bellis, Assistant Professor, (Physiology Biophysics); Integrin Biology/Implant Surfaces

John O. Burgess, Professor, (Prosthodontics); Clinical Trials, Caries Models, Dental Materials

David T. Curiel, Professor, (Pulmonary and Critical Care); Gene Therapy

John M. Cuckler, Professor, (Orthopedic Surgery); Skeletal Implants, Effects on Cells of Mechanical Stress

James Davidson, Associate Professor, (Civil, Construction, and Environmental Engineering); Injury Mechanics

Lawrence J. DeLucas, Professor, (Optometry); Protein Crystal Growth

Joanne T. Douglas, Assistant Professor, (Pathology); Gene therapy; adenoviral vectors; conditionally replicating adenoviruses

Evangelos Eleftheriou, Associate Professor, (Mechanical Engineering); Mechanical Systems, Automated Manufacturing, and Mechanical Design

Paul D. R. Gamlin, Professor, (Vision Sciences); Eye Movements, Pupillary Light Reflex

Timothy J. Gawne, Assistant Professor, (Vision Sciences); Central Visual Processing

Raymond E. Ideker, Professor, (Cardiovascular Disease); Study of Cardiac Arrhythmia, Cardioversion and Electrical Ablation for Treatment Of Arrhythmia

Kent T. Keyser, Professor, (Vision Sciences); Neurotransmitters and Receptors

John S. Kirkpatrick, Associate Professor, (Orthopedics); Orthopedic Surgery

Dennis F. Kucik, Associate Professor, (Pathology); Cell adhesion and motility

William R. Lacefield, Professor, (Prosthodontics); Coatings for Implants, Dental Ceramics and Alloys, Porcelain

Chris M. Lawson, Professor, (Physics); Nonlinear Optics, Fiber Optics, Optical Sensor

Michael McCraken, Associate Professor, (Prosthodontics); Dental Implants, Biomimetic Materials, Growth Factors

Jay M. McDonald, Professor and Chair, (Pathology); Cell signaling in bone disease, AIDS and cancer

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 ,Associate Professor, (Neurology); Brain Tumor Treatment & Research Program.

Charles W. Prince, Professor, (Nutrition Sciences); Dental Nutrition, Bone Biochemistry, Vitamin D, Calcium and Phosphorus Metabolism

Firoz Rahemtulla, Professor, (Oral Biology); Connective Tissue Biochemistry

Yogesh Vohra, Professor, (Physics); Biotechnology, Nanostructured Materials

Program Information

M.S.B.M.E. Program

The Master of Science in Biomedical Engineering may be a terminal degree or pursued as part of the doctoral program. With the terminal degree, employment is usually found in medical centers or with manufacturers of medical products, government agencies, health care groups, or computer application groups. Primary research areas are biomedical imaging, biomedical implants and devices, cardiac electrophysiology, as well as tissue engineering and regenerative medicine. Other research opportunities are available through our ongoing collaborations with the Medical and Dental Schools.

For admission to the program, a student should have earned a bachelor's degree in a field of engineering. Students with undergraduate degrees in the physical sciences, life sciences, or mathematics will also be considered for admission; however, such students will be required to demonstrate competence in engineering areas usually found in an undergraduate engineering curriculum. In some cases, preparatory courses in engineering may be required, with specific recommendations made by the student Graduate Studies Committee. Admission is competitive, and successful applicants will usually present scores of at least 500 on the verbal and at least 700 on the quantitative sections of the GRE General Test.

Typical students have an undergraduate GPA of 3.4 or greater and have participated in at least one research project while an undergraduate (e.g., laboratory research, senior design).

Program requirements include the following:

The student must complete at least 24 hours of graduate coursework beyond the Bachelor's. This includes: three 1-hour Departmental seminar courses (BME 601); Engineering Analysis (BME 517); at least one 3-hour Biostatistics course (e.g., BST 611 OR BST 621). The Departmental Graduate Program Director (along with the student's research advisor) work to devise an individualized curriculum developed to insure 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 majority of students carry out research leading to a thesis (plan I option). The student is expected to present their research at a scientific or technical conference and the research is expected to appear in a published peer-reviewed manuscript. Plan I students must register for at least 6 semester hours of BME 699 (thesis research) and successfully defend a thesis based on their research. Plan II (nonthesis option) students must take an additional 9 semester hours of graduate courses approved by the Graduate Studies Committee and successfully defend an independent study project.

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. The majority of our Ph.D. students enter the UAB BME Graduate program as M.S. students. However, students are not automatically matriculated into the Ph.D. program following a successful defense of their M.S. 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 write a letter to the Graduate Program Director and a decision will be made by the Graduate program Committee based on the student's academic record as well as recommendations from the student's M.S. committee members. Students who have earned a M.S. degree elsewhere may apply directly to our Ph.D. program and admission is competitive. Coursework in engineering and related medical or life science areas is required (a minimum of 24 semester hours of graduate coursework after completion of the master's degree). Additional coursework may be required in conjunction with the student's dissertation research committee. The program of study for each student is defined by the Graduate Program Committee and the student's research advisor 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 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.

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**.

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
Graduate Catalog Description	**http://main.uab.edu/show.asp?durki=24872**

For detailed information, contact Director, UAB Department of Biomedical Engineering, 801 Shelby Interdisciplinary Biomedical Research Bldg. , 1825 University Blvd., Birmingham AL 35294-2182 .

Telephone 205-996-6936

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

Web **www.eng.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.

Biomedical Engineering (BME)

505 **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.

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, bremmstrahlung, attenuation coefficients, comption 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, propogation 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, Lanrangian and Eulerian formulations, Green and Almansi strain, deformation gradiant 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:** In this course we will review fundamentals of structural biology: genetic sequence to protein structure and function, nucleic acid and membrane structure and function, introduce major computational methods for biomolecular modeling and their applications. Throughout the course, the students are given hands-on exercises in

computational structural biology using different software tools in the computer lab. Co - requisites: BME 517 (or ME 567) or the permission of Instructor. 3 credit hours.

590 **Special Topics in 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. Preq: BME 210. 3 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 andmethods 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.

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.

676, 776 **Fracture Mechanics**. Linear elastic mechanics, Griffin energy balance, Airy & Westergaard solutions, elastic-plastic fracture mechanics, materials testing and applications. 3 credit hours.

690, 790. **Special Topics in (Area)**. Course syllabus and grading policy required. 1-6 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.
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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, Reinforced Concrete Structures, Precast Concrete Products, Concrete Materials

Jennifer P. Harper, Assistant Professor (Civil, Construction, and Environmental Engineering); Environmental Engineering

Wilbur A. Hitchcock, Professor (Civil, Construction, and Environmental Engineering); Construction Engineering Management, Structural Engineering

Jason T. Kirby, Assistant Professor (Civil, Construction, and Environmental Engineering); Environmental Engineering, Hydraulics, Hydrology

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

Talat F. Salama, Assistant Professor (Civil, Construction, and Environmental Engineering); Construction Engineering Management, Structural Engineering, Finite Element Modeling

Virginia P. Sisiopiku, Associate Professor (Civil, Construction, and Environmental Engineering); Traffic Engineering, Intelligent Transportation Systems, Traffic Operations, Traffic Safety

Nasim Uddin, Associate Professor (Civil, Construction, and Environmental Engineering); Structural Engineering, Structural Dynamics, Intrastructure Rehabilitation, Hazard Mitigation

Secondary Appointment Faculty

Joseph H. Appleton, Distinguished Service Professor (Civil, Construction, and Environmental Engineering); Structural Engineering, Structural Mechanics, Computer Methods in Design.

Alan Eberhardt, Associate Professor (Biomedical Engineering); Solid Mechanics, Biomechanics, Analytical and Numerical Methods

Joseph J. Gauthier, Associate Professor (Department of Biology); Applied and Environmental Microbiology

Jay Goldman, Professor (Engineering); Industrial Engineering, Injury Control, and Transportation Systems

Reidar K. Oestenstad, Associate Professor (Environmental Health Sciences); Industrial Hygiene

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.

2. GPA of 3.0 or better (A = 4.0) in all undergraduate degree major courses attempted;

3. Three letters of evaluation concerning the applicant's previous academic and professional work; and

4. 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.

5. 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. 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.

Plan II (Nonthesis Option): Construction Engineering Management Emphasis

1. The student must successfully complete at least 33 semester hours of graduate credit, including the following:

a) A minimum of 24 semester hours of construction management courses from the CCEE Department, which may be satisfied from among the following courses: CE 671, CE 672, CE 673, CE 674, CE 676, CE 658, or an approved construction management course; and

b) A minimum of 6 semester hours from the MBA program, which may be satisfied from among the following courses; MBA 609, MBA 610, MBA 611, MBA 650, or an approved course from the MBA program; 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 design project.

Areas of Specialization

Specialization programs are available in the fields of environmental engineering, structural engineering/structural mechanics, construction 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 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

1. 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 are pursuing a Civil Engineering degree (B.S.C.E., M.S.C.E., PhD) 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
2. Structural Engineering
3. Environmental Engineering
4. Transportation Engineering
5. 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. Prerequisite: ME 251.

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*, Graduate**. 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

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.

671. **Techniques of Project Planning and Control.** Basic construction project scheduling procedures. Work breakdown structure, activity durations, status reports, resource allocations, and control. Critical path analysis for construction projects. Identification of project activities and their relationships. Schedule development, analysis, and updating. Relationship of project costs and resources to the schedule. Effective communication of schedule information.

672. **Construction Management.** Management of design and construction companies in the architecture-engineering-construction (A/E/C) industry. Focus is on management of risks inherent in the A/E/C industry: developing business strategies and organizations to cope with cyclical demand, alternative contracting approaches, managing receivables and cash flow, administration of human resources, safety, quality, insurance, and bonding. Students play different management roles in a computer simulation of a construction company.

673. **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.

674. **Construction Accounting and Finance.** Introduces the concepts and fundamentals of accounting and economics as they apply to construction companies. Introduction to the stock market with a focus on construction firms. Financial statement analysis, accounting concepts, project accounting methods, and the nature of project costs. Ownership structure, working capital, and the sources and uses of funds.

676. **Construction Methods and Technology.** The course will provide a fundamental understanding of construction methods employed to bring concepts and designs produced by architects and engineers to physical reality. Focus areas of study: earthmoving, heavy construction, building construction, and process plans. Students will understand the planning and deployment of equipment, materials, labor and sub-contractors required in construction process. Content will include classroom lectures and exercises supplemented by actual construction site visits. Guest presentations by industry practitioners also included.

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.

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.

Computer Engineering (Ph.D.*)

Degree Offered:	Ph.D.
Director:	Dr. Thomas C. Jannett
Phone:	(205) 934-8440
E-mail:	**ElecCompEng@uab.edu**
Web site:	**www.eng.uab.edu**

Faculty

Dale W. Callahan, Assistant Professor (Electrical and Computer Engineering); Wireless Communications, Digital Signal Processing, Telecommunications.

David A. Conner, Professor 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 Communications

Gary J. Grimes, Wallace R. Bunn Chair of Telecommunications and Professor (Electrical and Computer Engineering); Telecommunications, Optics, Photonics, Switching

Thomas C. Jannett, Professor (Electrical and Computer Engineering); Control Systems, Biomedical Instrumentation, Modeling and Simulation, Intelligent Sensor Systems

Dennis G. Smith, Associate Professor (Retired) (Electrical and Computer Engineering); Computer Systems, Computer Graphics, Neural Networks, Digital Control

Murat M. Tanik, Professor (Electrical and Computer Engineering); Software Systems Engineering, Integrated Systems Design, Process Engineering

Gregg L. Vaughn, Associate Professor and Chair (Electrical and Computer Engineering); Digital Signal Processing, Applications of Microprocessors, Digital Communications

See the graduate catalog of the University of Alabama at Huntsville (UAH) for the faculty of that university.

Program Information

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 computer engineering doctoral degree 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. A score of at least 500 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.

Conditional admission may be given to students who fail to meet one or more of the requirements for unconditional admission. 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. Those interested in minority fellowships should contact the UAB Graduate School directly for further information.

Program Requirements

The course of study leading to the Ph.D. in computer engineering includes a minimum of 60 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 60 hour 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 60 hour 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 15 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 15 semester hours of approved coursework in supportive fields;

5. Successful completion of a preliminary examination;

6. Successful completion of a qualifying examination with a presentation of the dissertation topic;

7. A research dissertation consisting of a minimum of 18 semester hours in electrical and computer engineering; and

8. Successful completion of a final examination consisting of a presentation of 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	**http://main.uab.edu/show.asp?durki=44631**

For detailed information, contact

Dr. Thomas C. Jannett, Graduate Program Director
UAB Department of Electrical and Computer Engineering. BEC 259D
1530 3rd Avenue South, Birmingham, Alabama 35294-1170.

Telephone 205-934-8440

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

Web **www.eng.uab.edu**

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. Maximum of 3 credit hours applicable toward the Computer Engineering Ph.D. 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 verbal presentations related to these work products. Prerequisite: Graduate standing in Engineering and successful pretest performance.

621. **Random Variables and Processes.** Theory underlying analysis and design of communication, stochastic control, data gathering, and data analysis systems. Prerequisite: EE 421 or permission of instructor.

622. **Advanced Communication Theory**. Analysis of performance of analog modulation techniques in presence of noise. Prerequisites: EE 421 and 621, or permission of instructor.

624. **Digital Communications**. Design of digital communications systems. Prerequisites: EE 621 and 622.

625. **Coding and Information Theory**. Entropy, channels and channel capacity, RLL codes, error correcting codes, cyclic codes, cryptography, convolutional codes, trellis coded modulation. Prerequisite: graduate standing.

626. **Digital Image Processing**. Digital image processing fundamentals, image transformations, image enhancement, image restoration, image compression, image segmentation, and image presentation. Prerequisite: EE 423 or 523.

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 and engineering standards related to networking. Network hardware, ethernet, token ring, ISDN, ATM, networking protocols including TCP/IP protocol suite, internetworking, LANs, and typical applications. 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: EE 532 or permission of instructor.

634. **Introduction to Neural Networks**. Neural network topologies and learning algorithms with an emphasis on back propagation. Applications and limitations of networks. Designing networks for specific uses. Individual software project. Prerequisites: EE 210 or permission of instructor.

635. **Telecommunication Systems**. System organization and structure; data transmission. Prerequisite: Permission of instructor.

636. **Advanced Digital Design**. Large-scale class project. Sample topics include math coprocessors, text coprocessors, CRT controllers, and data encryption devices. Prerequisite: Permission of instructor.

637. **Computer Graphics I**. Graphic devices, drawing curves, interactive graphics, transforms, and three-dimensional graphics. Projects involving hardware and software. Prerequisite: EE 337, or permission of instructor.

638. **Computer Graphics II**. Raster graphics, faces, coloring faces, hidden-surface elimination, ray tracing, and image enhancement. Projects involving hardware and software. Prerequisite: EE 637.

639. **Advanced Microprocessors**. Topics covering both hardware and software issues. Individual or group term project. Prerequisite: EE 438 or 538 or 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: EE 233 or other software design experience using C, or permission of instructor.

641. **Modern Control I**. Sampled-data and discrete-time systems. State variable models, state feedback and estimation. Optimal control and estimation. Predictive control. Introduction to system identification. Prerequisite: EE 426 or permission of instructor.

642. **Intelligent Systems**. Organization and characteristics of intelligent systems. Neural network and fuzzy logic algorithms. 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. Proposal development and software design. Integrates experience from computer science, communication, systems engineering, and problem solving. Prerequisite: Permission of instructor.

651. **Software Engineering Large Systems I**. Notions of process and integrated system views. Software architecture and modeling are discussed and related to levels in Object Oriented Design. Java is used as the programming paradigm. Prerequisite: EE 650 or permission of instructor.

652. **Software Engineering Large Systems II**. Components are introduced as elements of software system implementations. Object-oriented design patterns and techniques are reviewed. Java components are used for programming. Prerequisites: EE 650 and EE 651 or permission of instructor.

657. **Enterprise Information Architecture Engineering.** Development and management of distributed computing including hardware, software, and communications. Prerequisite: Permission of instructor.

661. **Advanced Electrical Machinery I**. Synchronous machine theory. Prerequisites: EE 461 or 561, and 472 or 572, or permission of instructor.

662. **Advanced Electrical Machinery II**. Induction machine theory. Prerequisite: EE 661.

663. **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; protection of system. Prerequisite: EE 472 or 572 or permission of instructor.

673. **Reliability of Power Systems**. Component reliability using standard industrial techniques. Prerequisite: EE 471 or 571 or 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: EE 472 or 572, or permission of instructor.

682. **Multivariable Systems.** Analysis and design of multiple-output, multiple-input control systems. Prerequisite: Permission of instructor.

684. **Engineering Management of Information Resources**. Management of critical information and information intensive change, management of quality, information flow and use and process improvement. Permission of instructor.

685. **Advanced Engineering Operations**. Procedural, planning, and control aspects of engineering projects. Project management of teams. Prerequisite: Permission of instructor.

686. **Technical Entrepreneurship I**. Entrepreneurship and intrapreneurship in venture capital financed companies. Management teams are formed, and ventures are selected and simulated over an extended period of time. Prerequisite: Permission of instructor.

687. **Technical Entrepreneurship II**. Continuation of EE 686. Prerequisite: EE 686.

688. **Advanced Information Engineering**. Applications of information engineering in partnership with local industries. planning and problem solving or information engineering design. 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. Project for Plan II Master's students**. Prerequisite: Permission of instructor.

*698. **Nonthesis Research**. Non-thesis research. Does not count towards a degree.1-12 hours.

*699. **Thesis Research**. Thesis for Plan I Master's students. Prerequisite: Admission to candidacy. 1-12 hours.

701. **Electrical Engineering Seminar**. 1-3 hours.

724. **Digital Communications.** Design of digital communication systems. Prerequisites: EE 621 and 622.

725. **Coding and Information Theory**. Entropy, channels and channel capacity, RLL codes, error correcting codes, cyclic codes, cryptography, convolutional codes, trellis coded modulation. Prerequisite: graduate standing.

726. **Digital Image Processing**. Digital image processing fundamentals, image transformations, image enhancement, image restoration, image compression, image segmentation, and image presentation. Prerequisite: EE 623.

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: EE 532 or permission of instructor.

734. **Introduction to Neural Networks**. Neural network topologies and learning algorithms with an emphasis on back propagation. Applications and limitations of networks. Designing networks for specific uses. Individual software project. Prerequisites: EE 210 or permission of instructor.

737. **Computer Graphics I**. Graphic devices, drawing curves, interactive graphics, transforms, and three-dimensional graphics. Projects involving hardware and software. Prerequisite: Permission of instructor.

738. **Computer Graphics II**. Raster graphics, faces, coloring faces, hidden-surface elimination, ray tracing, and image enhancement. Projects involving hardware and software. Prerequisite: EE 637 or 737.

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: EE 233 or other software design experience using C, or permission of instructor.

742. **Intelligent Systems**. Organization and characteristics of intelligent systems. Neural network and fuzzy logic algorithms. 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.

747. **Distributed Control Systems**. Application of distributed control to process, integration, and operator interfaces. Prerequisite: Permission of instructor.

750. **Software Engineering**. Introduces classical software lifecycles and software development paradigms. Proposal development and software design. Integrates experience from computer science, communication, systems engineering, and problem solving. Prerequisite: Permission of instructor.

751. **Software Engineering Large Systems I**. Notions of process and integrated system views. Software architecture and modeling are discussed and related to levels in Object Oriented Design. Java programming is used as the programming paradigm. Prerequisite: EE 650 or 750 or permission of instructor.

752. **Software Engineering Large Systems II**. Components are introduced as elements of software system implementations. Object-oriented design patterns and techniques are reviewed. Java components are used for programming. Prerequisites: EE 650 or 750 and EE 651 or 751 or permission of instructor.

761. **Advanced Electrical Machinery I**. Synchronous machine theory. Prerequisites: EE 461 or 561 and 472 or 572, or permission of instructor.

762. **Advanced Electrical Machinery II**. Induction machine theory. Prerequisite: EE 661 or 761.

763. **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, and protection of system. Prerequisite: EE 472 or 572, or permission of instructor.

773. **Reliability of Power Systems**. Component reliability using standard industrial techniques. Prerequisite: EE 471 or 571, or 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: EE 472 or 572, or permission of instructor.

782. **Multivariable Systems**. Analysis and design of multiple-output, multiple-input control 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:	Dr. Thomas C. Jannett
Phone:	(205) 934-8440
E-mail:	**ElecCompEng@uab.edu**
Web site:	**www.eng.uab.edu**

Faculty

Dale W. Callahan, Assistant Professor (Electrical and Computer Engineering); Wireless Communications, Digital Signal Processing, Telecommunications.

David A. Conner, Professor 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 Communications

David G. Green, Instructional Associate Professor (Electrical and Computer Engineering); Computer Networking, Software Engineering, Computer Applications

Gary J. Grimes, Wallace R. Bunn Chair of Telecommunications and Professor (Electrical and Computer Engineering); Telecommunications, Optics, Photonics, Switching

Thomas C. Jannett, Professor (Electrical and Computer Engineering); Control Systems, Biomedical Instrumentation, Modeling and Simulation, Intelligent Sensor Networks

James R. Jones, Associate Professor Emeritus (Electrical and Computer Engineering); Commercial/Industrial and Utility Power Systems

Jon R. Marstrander, Instructor (Electrical and Computer Engineering); Electronics, Digital Systems, Digital Signal Processing, Image Processing

Dennis G. Smith, Associate Professor (Retired) (Electrical and Computer Engineering); Computer Systems, Computer Graphics, Neural Networks, Digital Control

Murat M. Tanik, Professor (Electrical and Computer Engineering); Software Systems Engineering, Integrated Systems Design, Process Engineering

Gregg L. Vaughn, Associate Professor and Chair (Electrical and Computer Engineering); Digital Signal Processing, Applications of Microprocessors, Digital Communications

Program Information

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.

Verification of registration by examination as a Professional Engineer [P.E.] will satisfy Admission Criteria 3 and 4.

Conditional admission may be given to students who fail to meet one or more of the requirements for unconditional admission. If admitted, student will be advised of measures necessary to correct deficiencies.

Financial Support

Assistantships 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 special minority fellowships available through the Graduate School. Those interested in minority fellowships should 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;

4. Successful completion of a project developed through registration for at least 3 semester hours of EE 697; and

5. Successful completion of a project developed through registration for at least 3 semester hours of EE 697, and successful completion of an examination on the project.

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 requirement waived for persons holding registration as professional engineers
Graduate Catalog Description	**http://main.uab.edu/show.asp?durki=24874**

For detailed information, contact

Dr. Thomas C. Jannett, Graduate Program Director
UAB Department of Electrical and Computer Engineering. BEC 259D
1530 3rd Avenue South, Birmingham, Alabama 35294-1170.

Telephone 205-934-8440

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

Web **www.eng.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.

Electrical and Computer Engineering (EE)

511. **Facilities Engineering**. General engineering project planning, apply codes and standards, preliminary design, economic forecasting, environmental planning reports, site selection, population displacement, cash flow, specifications plans.

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 DSPs 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 (PID) 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. Network hardware, Ethernet, token ring, ISDN, ATM, networking 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 will be covered. Use of software tools. Four projects. 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 from Intel and IBM. 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 laboratory. Prerequisite: Coursework in networking.

546. **Industrial Control Projects for Information Age.** In-depth group and individual projects in industrial control with emphasis on information systems applications. Projects in areas such as programmable logic controllers, distributed control systems, factory automation, man-machine interface software and hardware, intelligent control, real-time systems, database applications, and distributed computing. Lecture and laboratory. Prerequisite: Coursework in control systems or permission of instructor.

547. **Internet/Intranet Application Development.** Development of applications and models using Internet/Intranet technologies such as Java, JavaScript, conferencing systems, 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.** Builds on Object-Oriented concepts. Coverage for Unified Modeling Language is expanded and Design Patterns are incorporated. 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.

551. **Digital Electronics**. Basics of semiconductor physics and switching behavior of bipolar and MOS transistors. Properties of CMOS, TTL, and ECL logic families. Semiconductor memory. IC fabrication. State machine and large-scale project techniques. Manual layout of small ICs using LSI Edit. Laboratory involves measuring device characteristics and designing and implementing several types of sequential circuits. Lecture and laboratory. Prerequisites: Coursework in microprocessors, assembly language programming and electronics or permission of instructor.

552. **VHDL Digital Systems Design**. Computer Design Automation using VHDL. Architectural, behavioral, and logical descriptions of digital systems. Logic verification and simulation. Projects involve designing complex integrated circuits using modern tools. 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 and per-unit representation. Introduction to symmetrical components. Modeling of generators, transformers, and transmission lines for system studies. The power-flow problem and the power system stability problem. 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. 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. Maximum of 3 credit hours applicable toward the M.S.E.E. degree. Prerequisite: permission of instructor. 1-3 hours.

605. **Information Engineering Seminar**. Guest speakers will address various industry topics, trends and directions. Students will complete a set of exercises to assess individual

learning styles, leadership attributes, management styles, and professional goals. Prerequisite: Graduate status in Electrical and Computer Engineering.

606. **Technical Project Management**. Focuses on the concepts of project management and the development of practical strategies for managing technical projects. Prerequisite: Graduate status in Electrical and Computer Engineering.

607. **Information Engineering Technologies**. Provides an overview of the technologies for information engineering. Prerequisite: Graduate status in Electrical and Computer Engineering.

608. **Strategic Management**. Addresses strategic decisions and simulations. The focus is on decision-making under conditions of uncertainty. Prerequisite: Graduate status in Electrical and Computer Engineering, EE 605, and EE 606.

609. **Information Engineering Software**. Software and software design issues for information engineering. **Prerequisite: Graduate status in Electrical and Computer Engineering, EE 605, and EE 607.**

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.

611. **Special Topics in Information Engineering**. Exploration of a current topic related to information engineering. **Prerequisite: Graduate status in Electrical and Computer Engineering, EE 605, EE 606, EE 607, EE 608, and EE 609.**

612. **Technical Entrepreneurship**. Covers technical business startups including proposals, finance, product development, market strategy, strategic alliances, and leadership. Prerequisite: Graduate status in Electrical and Computer Engineering, EE 605, EE 606, and EE 608.

613. **Information Engineering Security**. Security, privacy, and related issues/technologies for information engineering. Prerequisite: Graduate status in Electrical and Computer Engineering, EE 605, and EE 607, EE 609, and EE 611.

614. **Technology Ventures**. Catalog Data: Development and defense of a technical business plan. Examines legal, regulatory, and other related issues that impact the venture. Prerequisite: Graduate status in Electrical and Computer Engineering, EE 605, EE 606, EE 608, and EE 612.

615. **Information Engineering Design**. System design of information engineering systems. Prerequisite: Graduate status in Electrical and Computer Engineering, EE 605, EE 607, EE 609, EE 611, and EE 613.

616. **Information Engineering Project**. Project will allow students an opportunity to develop ideas and a body of work related to a specific area of interest under the direction of a faculty member/technical advisor. Prerequisite: Graduate status in Electrical and Computer Engineering, EE 605, EE 606, EE 607, EE 608, EE 609, EE 611, EE 612, and EE 613.

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 communications 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.

634. **Introduction to Neural Networks**. Neural network topologies and learning algorithms with an emphasis on back propagation. Applications and limitations of networks. Designing networks for specific uses. Individual software project. Prerequisites: Coursework in digital logic or permission of instructor.

635. **Telecommunication Systems**. System organization and structure. Data transmission. Prerequisite: Permission of instructor.

636. **Advanced Digital Design**. Large-scale class project. Sample topics include math coprocessors, text coprocessors, CRT controllers, and data encryption devices. 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**. State variable models for discrete time systems. Sampled-data systems. State feedback and pole placement. Optimal control and estimation. Predictive control. Prerequisite: Coursework in control systems or permission of instructor.

642. **Intelligent Systems**. Organization and characteristics of intelligent systems. Neural network and fuzzy logic algorithms. 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 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**. 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. Prerequisite: Admission to candidacy. 1-12 hours.

Environmental Health Engineering (Ph.D.)

Degree Offered:	Ph.D.
Director:	Dr. Melinda Lalor (Engineering)
Phone:	(205) 934-8410
E-mail:	**mlalor@uab.edu**
Web site:	**www.eng.uab.edu**

Co-Director:	Dr. Gary Cheng (Mechanical Engineering)
Phone:	(205) 934-2038
E-mail:	**gcheng@uab.edu**
Web site:	**http://www.eng.uab.edu/me/Faculty/gcheng**

Faculty

Andreas S. Anayiotos, Associate Professor (Biomedical Engineering); Cardiovascular flow dynamics, cardiovascular modeling, hemodynamic implant and device design, ultrasound and magnetic resonance imaging techniques

Robert A. Angus, Professor (Biology); Effects of urban watershed development on aquatic habitat quality and biological diversity in rivers, Endocrine disruptors in the environment

Alfred A. Bartolucci, Professor (Biostatistics); Applied statistical analysis, sampling and exposure assessment

Steven M. Becker, Assistant Professor (Environmental Health Sciences); Director, Social/Behavioral & Public Policy Unit, Center for Disaster Preparedness; Co-director, Environmental Health Engineering. Toxic Disasters (U.S. and overseas); Bioterrorism, Environmental Management, Environmental Health Policy

Krishan Chawla, Professor (Materials Science and Engineering); processing, microstructure, and properties of fibers and composite materials (fiber and particle reinforced), especially interfacial engineering in composites

Gary Cheng, Assistant Professor (Mechanical Engineering); Combustion, Computational Fluid Dynamics, Multi-phase Flow Transport, Rocket Engine System, Plume Dynamics.

Gary Cutter, Professor (Biostatistics); Design, measurement and interpretation of clinical trials, epidemiological studies and evaluation research.

Sarah E. Culver, Associate Professor (Business); Macroeconomics, International Monetary Economics, and Exchange Rate Theory

Derrick R. Dean, Associate Professor (Materials Science and Engineering); development of nanoscopic fibers by electrospinning, biodegradeable polymer blends and nanocomposites, multiscale, mutifunctional polymeric composites, matrix development for fiber reinforced composites, morphological, rheological and thermal analysis of polymers

Joseph J. Gauthier, Associate Professor (Biology); Biological waste treatment systems, Microbial degradation of hazardous substances and solid wastes, Development of water recycle systems.

Jong-Eun Kim, Assistant Professor (Mechanical Engineering); Computational biomechanics, computational crashworthiness, multidisciplinary design optimization, fluid-structure interaction and aeroelasticity

Jason Kirby, Assistant Professor (Civil and Environmental Engineering); Assessment of potential climatic change / climatic variability impacts on the hydrologic cycle (i.e. water availabilty), Development of sustainable remediation technologies for use in urban and/or industrial settings

Roy Koomullil, Assistant Professor (Mechanical Engineering); Computational Fluid dynamics, Parallel Computing, compressible and Incompressible Flows, Moving Body Field Simulations

Melinda M. Lalor, Associate Professor (Civil and Environmental Engineering); Surface Water Quality, Urban Watershed Management, Pollution Prevention and Sustainable Development

David Littlefield, Professor (Mechanical Engineering); Computational methods and design

Sreelatha Meleth, Assistant Professor (Medicine); Statistical applications related to health and medicine, Data analysis

Robert W. Peters, Associate Professor (Civil 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

Nalini Sathiakumar, Associate Professor (Epidemiology); cancer and infectious diseases epidemiology

Alan Shih, Associate Research Professor (Mechanical Engineering); Visualization, Mesh Generation and Adaptation, Computer Graphics, Virtual Reality, Computer Aided Engineering

Bharat Soni, Chair and Professor (Mechanical Engineering); High Performance Computing, Mesh Generation and Adaptation, Computational Field Simulation, Computer Aided Geometry Design and Engineering, Adaptive Engineering Systems.

Peter M. Walsh, Research Professor (Mechanical Engineering); Formation and Evolution of Carbonaceous and Inorganic Particles in Flames, Characterization and Control of Particulate Matter Emissions from Combustion Systems

Program Description

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 industry professional must be able to change focus and move between disciplines in order to keep up with rapid market shifts and technological advances.

This unique, interdisciplinary program takes advantage of UAB's diversified engineering school, and nationally renowned health sciences center, to produce Ph.D. candidates cross-trained in two or more disciplines.

Admission Requirements

Students applying to the Environmental Health Engineering program must submit official transcripts and GRE scores. In general, a combined GRE score of at least 1100 (verbal and quantitative), and a minimum undergraduate GPA of 3 on a 4 point scale are required for admission. Minimum acceptable TOEFL scores for students for whom English is a second language are as follows: General TOEFL – 600, or Computer Based TOEFL – 250, or IBT score – 20 per section. Admission on probation may be possible in some circumstances for students not meeting these requirements. Admission decisions will be made by the program steering committee.

Enrollment

Students are expected to remain continuously enrolled in the EHE program until the completion of their dissertation.

Coursework and Dissertation Research Requirement

The PhD in Interdisciplinary Engineering has a research based curriculum. Specific course work is directed by the student's graduate research committee and based on the student's area of research interest. Committee members must be selected from at least two different departments, and the planned curriculum must result in cross-training in two or more disciplines.

Students entering the Ph.D. degree program with a baccalaureate degree must complete the following credit hours of coursework and research:

Coursework	48 hours
Dissertation Research*	24 hours
Environmental Health Engineering Seminar	Continuous enrollment

*an approved internship may be substituted for 6 hours of dissertation research

Transfer of Credit

Courses of full graduate-level credit earned in an accredited institution where a student was enrolled in the graduate school may be submitted for review for inclusion in the doctoral program. It is the student's responsibility to assure that an official transcript of the credit concerned is received by the graduate school.

Acceptance of credit requires the approval of the Environmental Health Engineering steering committee and the Graduate School Dean. Credit will not be accepted for transfer from any institution at which the student failed to achieve a “B” average on all graduate work attempted. With approval, up to one-half of the required coursework for the doctoral degree may be transferred from another institution.

Exams and Dissertation

Qualifying Exam

A Qualifying 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, a student is admitted into doctoral candidacy.

Dissertation

A dissertation showing ability to conduct independent research, organizational and presentation skills must be prepared on a topic in the major field. Dissertation results are expected to be submitted for refereed scholarly publication. The dissertation must comply with the regulations set forth in the UAB dissertation preparation guide, which is available from the Graduate school office.

Final Exam

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 Office of the Graduate School at least six weeks before the commencement at which the degree is to be conferred.

Additional Information

For detailed information, contact Dr. Melinda M. Lalor, Associate Dean, School of Engineering, HOEN 110, 1530 3rd Ave. S., Birmingham, AL 35294-4440. Telephone 205-934-8438

Course Descriptions

Students in this interdisciplinary program work closely with their faculty advisors to select courses that support their interests and research activities. Typically, appropriate courses are selected from the Departments of Civil and Environmental Engineering, Mechanical Engineering, Materials Engineering, Environmental Health Science, International Health, Epidemiology, Biostatistics, Computer Science, Biology and Chemistry.

Materials Engineering (Ph.D., M.S.Mt.E.)

Degree Offered:	Ph.D., M.S.Mt.E.
Director:	Dr. Burton R. Patterson
Phone:	(205) 934-8450
E-mail:	**patters@uab.edu**
Web site:	**www.eng.uab.edu**

Faculty

J. Barry Andrews, Professor (Materials Science and Engineering); Solidification, Microgravity Processing, Physical Metallurgy, Intermetallic Materials, Electronic Properties

Charles E. Bates, Research Professor (Materials Science and Engineering); Casting and Solidification Processes of Iron and Steel, Machinability, Environment

Krishan K. Chawla, Professor (Materials Science and Engineering); Metal, Ceramic, and Polymer Matrix Composite Materials; Fibers, Interfacial Phenomena

Derrick R. Dean, Associate Professor (Materials Science and Engineering); Structure-Property relationships of polymers and multiphase polymer systems, including blends, nano- and micro-composites

Robin D. Griffin, Research Associate Professor (Materials Science and Engineering); Electron Microscopy, Physical Metallurgy, Metals Casting

Gregg M. Janowski, Associate Professor (Materials Science and Engineering); Electron Microscopy, Composite Materials, Physical Metallurgy, Structure-Processing-Property Relationships

Burton R. Patterson, Professor (Materials Science and Engineering); Powder Processing, Physical Metallurgy, Quantitative Microscopy

Rosalia N. Scripa, Professor (Materials Science and Engineering); Ceramics and Glass, Extractive Metallurgy, Semiconductor Crystal Growth, Electronic-Magnetic Materials

Uday Vaidya, Professor (Materials Science and Engineering); Polymer Matrix Composites, Processes & Process Modeling, Nondestructive Evaluation and Dynamic Response

Secondary and Adjunct Faculty

Dale S. Feldman, Associate Professor (Biomedical Engineering); Porous Polymeric Soft Tissue Implant Biocompatibility, Biodegradable Composites, Biomechanics

Fouad Fouad, Professor (Civil and Environmental Engineering); Structural Engineering; Prestressed Concrete; Concrete Materials; Computer Applications

Christopher M. Lawson, Professor (Physics); Nonlinear Optics and Optical Sensing/Imaging

Jack E. Lemons, Professor (Biomedical Engineering); Design of Ligament and Tendon Prostheses, Development of Synthetic Bone Products, Biocompatibility, Corrosion

Linda C. Lucas, Professor (Biomedical Engineering); Corrosion Evaluation of Implant Alloys, Biocompatibility of Dental and Orthopedic Biomaterials

E. Douglas Rigney, Academic Associate Professor (Biomedical Engineering); Corrosion, Biomaterials, Metal, Ceramic Interfaces, Surface Modification, Wear

David L. Shealy, Professor (Physics); X-ray Telescopes, Microscopes and Lithography; Optics, Free Electron Lasers, Microelectronic Packaging Materials

Yogesh K. Vohra, Professor (Physics); Laser and X-ray Characterization of Materials at Extreme Conditions

Participating Faculty from the University of Alabama (Tuscaloosa)

Viola L. Acoff, Associate Professor (Metallurgical and Materials Engineering); Physical Metallurgy, High Temperature Materials, Electron Microscopy, Welding

Richard C. Bradt, Professor (Metallurgical and Materials Engineering); Ceramic Materials

Nagy H. El-Kaddah, Professor (Metallurgical and Materials Engineering); Materials Process Modeling, Magnetic Field Effects on Molten Metals

Subhadra Gupta, Associate Professor (Metallurgical and Materials Engineering); Thin Films Lab and PVD Process

Ramana G. Reddy, ACIPCO Professor (Metallurgical and Materials Engineering); Thermodynamics and Kinetics of Metallurgical Reactions; Phase Stability; Fused Salt Electrolysis; Synthesis of Ceramics and Intermetallics; Modeling; Waste Metal Recovery

Gregory B. Thompson, Assistant Professor (Metallurgical and Materials Engineering); Phase Stability And Phase Transformations in Thin Films and Nanoparticles.

Srinath Vishwanathan, Professor (Metallurgical and Materials Engineering); Modeling of Solidification Processes

Garry W. Warren, Professor (Metallurgical and Materials Engineering); Corrosion and Surface Electrochemistry, Atom Probe Tomography, Transmission Electron Microscopy

Mark Weaver, Associate Professor (Metallurgical and Materials Engineering); Microstructure-Property Relations; Intermetallic Compounds; Structural Materials; Thin Films; Materials Characterization

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. For international applicants from non-English speaking countries, minimum scores of 580 on the TOEFL, and 3.5 on the TWE.

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 in an ABET-accredited program 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 later in this section under "Preparatory Courses." All full-time master's students must take MSE 601-Materials Science and Engineering Seminar every term.

Plan I (Thesis Option)

1. The student must successfully complete at least 24 semester hours of graduate course work, 9 of which may be at the 500 level, including
   - 18 semester hours in materials science and engineering;
   - 3 semester hours in an approved course in mathematics, physical sciences, or other engineering discipline; and
   - 3 semester hours either in (1) materials science and engineering, (2) an approved course in mathematics, physical sciences, or another engineering discipline, or (3) an approved course in management.
2. 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 in addition to the 24 semester hours of course work.

Plan II (Nonthesis Option): Research/Design Emphasis

1. The student must successfully complete at least 33 semester hours of graduate credit, 9 of which may be at the 500 level, including
   - 24 semester hours of materials science and engineering course work;
   - 3 semester hours of course work in an approved mathematics, physical science, or other engineering discipline;
   - 3 semester hours either in (1) materials science and engineering, (2) an approved course in mathematics, physical sciences, or another engineering discipline, or (3) an approved course in management; and
   - 3 semester hours of MSE 698-Nonthesis Research involving an on-site design or research project (usually undertaken after completion of all course work).

2. The student must 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

1. The student must successfully complete at least 33 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: MBA 660-Quantitative Methods I and either EC 520-Applied Forecasting or another approved advanced management course;
   - 9 semester hours of engineering-oriented management coursework. Approved courses include CE 558-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;
   - 3 hours of MBA 631-Administrative Theory and Practice; and
   - 3 semester hours of MSE 698-Nonthesis Research involving an on-site design or research project (usually undertaken after completion of all course work).
2. The student must 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). Each student is required to earn an M.S.Mt.E. as a step toward a doctoral degree. This requirement can be waived for a student entering the program with a master's degree in Materials Engineering or closely related field. The Ph.D. program requires a minimum of 18 hours of course work after the master's degree, successful completion of comprehensive examinations, and successful defense of a Ph.D. dissertation. All full-time doctoral students must take MSE 701-Materials Science and Engineering Seminar every term.

The requirements for a Ph.D. for a student with a master's degree are

- A minimum of 18 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). Additional course work may be required at the discretion of the mentor and program director.

- Successful completion of a comprehensive examination covering both undergraduate and graduate course work.

- Successful defense of a research dissertation in metallurgical/materials engineering (minimum of 24 semester hours in MSE 799-Dissertation Research).

Preparatory Courses

A student seeking a graduate degree in materials engineering without a baccalaureate degree in Materials Engineering or similarly named engineering field from an ABET-accredited school must demonstrate competence at the undergraduate level in the areas of physical behavior of materials, thermodynamics, mechanical behavior of materials, transport phenomena, and characterization. He or she may do this by passing an examination set by the Materials Engineering faculty or by passing all or some of the following courses, depending on the student's academic background. The program director will decide which courses the student can be exempt from taking. 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 requirement are

MSE 280-Engineering Materials
MSE 281-Physical Materials I
MSE 380-Thermodynamics of Materials
MSE 381-Physical Materials II
MSE 382-Mechanical Behavior of Materials.
MSE 465-Characterization of Materials

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.

Additional Information

Deadline for Entry Term(s):	Each semester and 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	None
Graduate Catalog Description	http://main.uab.edu/show.asp?durki=24876

For detailed information, contact Dr. Burton R. Patterson, Graduate Program Director, The University of Alabama at Birmingham, Department of Materials Science and Engineering, BEC 254, 1530 3rd Avenue South, Birmingham, AL 35294-4461.

Telephone 205-934-8450

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. Prerequisites: MSE 281 and MA 125

502. **Frontiers of Materials**. Recent advances in materials technology and application. Novel processing, structures, properties, and performance issues. Prerequisite: MSE 281

503. **Degradation of Materials**. Issues in long-term utilization of materials. Corrosion, high temperature oxidation, creep, fatigue, and their interactions. Prerequisite: MSE 281

504. **Ferrous Casting Production and Inspection**. Production and evaluation of cast ferrous metals (gray iron, ductile iron and carbon steel). Major casting techniques, gating and risering, solidification, phase formation, and inspection. Laboratories will include experiments and plant trips. Prerequisite: MSE 280

506. **Aluminum Casting Production and Inspection**. Production and evaluation of cast aluminum, especially alloys 319, 356 and 357 and 380. Major casting techniques, gating and risering, degassing, pouring, solidification, phase formation, and inspection. Laboratories will include experiments and plant trips. Prerequisite: MSE 280

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. Prerequisites: MSE 281 and MSE 382 is recommended.

530. **Polymeric Materials**. (Also CH 580.) Processing methods, structure-engineering-property relationships, and applications of polymeric materials. Prerequisites: MSE 281, CH 117, and CH 118

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. Prerequisite: MSE 465

564. **Metals and Alloys**. Microstructures, properties, heat treatment, and processing of ferrous and nonferrous materials. Prerequisite: MSE 281

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. Prerequisite: MSE 281

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. Prerequisites: MSE 281, CH 117, and CH 118

584. **Electronic, Magnetic and Thermal Properties of Materials**. Fundamentals of electron band structures, mechanisms behind rectifying junctions, transistors, paramagnetism, diamagnetism, and ferromagnetism. Prerequisites: MSE 280 and PH 222

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. Prerequisite: MSE 380

613. **Mechanical Behavior of Materials**. Microstructural effects on the deformation mechanisms responsible for mechanical behavior of engineering materials. Prerequisite: 382

615. **Nucleation and Growth**. Nucleation, growth, and phase transformations in materials. The roles of heterogeneities, boundaries, temperature, and free energy are addressed. Prerequisites: MSE 381 and 603

616. **Microstructural Processes**. Theory and application of the principal microstructural processes in materials, including recrystallization, grain growth, coarsening, and sintering. Prerequisite: MSE 615

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. Prerequisite: MSE 381

631. **Polymer Structure and Morphology**. Application of x-ray and electron diffraction, light, electron and atomic force microscopy to crystal structure and morphology of polymers. Morphology -processing- property relationship, deformation mechanisms and orientation characterization. Prerequisites: MSE 430/530 or BME 411/511

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. Prerequisites: MSE 401 or ME 405; MSE 430/530 or BME 411/511

634. **Design/Manufacturing Technology for Automotive Applications**. Basics of lightweight materials, avenues on automotive component designs, emerging processing technologies in lost foam casting, thermoplastic composites and testing methodologies. Prerequisite: MSE 413

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. Prerequisite: MSE 413

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 carbides). Application of Weibull statistics to strength of fibrous materials, techniques of mechanical testing of fibers and applications of fibers in various fields. Prerequisite: MSE 382

637. **Quantitative Microscopy**. Quantitative description of microstructural features. Relationships between microstructural characteristics and properties. Prerequisite: MSE 381

643. **Materials Characterization I**. Fundamentals of materials characterization using electron and X-ray techniques. Topics include advanced crystallography, electron optics, and interactions of energetic electrons with solids. Some applications of X-ray diffraction will be addressed. Lecture and laboratory. Prerequisite: MSE 465

644. **Materials Characterization II**. Applications of materials characterization using electron and X-ray techniques. Topics include imaging and X-ray spectroscopy using scanning electron microscopy; imaging, diffraction, and X-ray spectroscopy using transmission electron microcopy; and advanced X-ray diffraction techniques. Lecture and laboratory. Prerequisite: MSE 643/743

653. **Phase Diagrams**. Analysis and interpretation of binary, ternary, and more complex phase diagrams including thermodynamic basis and construction. Prerequisite: MSE 381

667. **Process Modeling and Simulation for Lightweight Materials**. 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. Prerequisites: MSE 401 or ME 405, MA 227

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. Prerequisite: MSE 380

713. **Mechanical Behavior of Materials**. Microstructural effects on the deformation mechanisms responsible for mechanical behavior of engineering materials. Prerequisite: MSE 382

715. **Nucleation and Growth**. Nucleation, growth and phase transformations in materials. The roles of heterogeneities, boundaries, temperature, and free energy are addressed. Prerequisites: MSE 381 and 603/703

716. **Microstructural Processes**. Theory and application of the principal microstructural processes in materials, including recrystallization, grain growth, coarsening, and sintering. Prerequisite: MSE 615/715

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. Prerequisite: MSE 381

731. **Polymer Structure and Morphology**. Application of x-ray and electron diffraction, light, electron and atomic force microscopy to crystal structure and morphology of polymers. Morphology -processing- property relationship, deformation mechanisms and orientation characterization. Prerequisites: MSE 430/530 or BME 411/511

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. Prerequisites: MSE 401 or ME 405; MSE 430/530 or BME 411/511

734. **Design/Manufacturing Technology for Automotive Applications**. Basics of lightweight materials, avenues on automotive component designs, emerging processing technologies in lost foam casting, thermoplastic composites and testing methodologies. Prerequisite: MSE 413

735. **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. Prerequisite: MSE 413 or equivalent

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. Prerequisite: MSE 382

737. **Quantitative Microscopy**. Quantitative description of microstructural features. Relationships between microstructural characteristics and properties. Prerequisite: MSE 381

743. **Materials Characterization I**. Fundamentals of materials characterization using electron and X-ray techniques. Topics include advanced crystallography, electron optics, and interactions of energetic electrons with solids. Some applications of X-ray diffraction will be addressed. Lecture and laboratory. Prerequisite: MSE 465

744. **Materials Characterization II**. Applications of materials characterization using electron and X-ray techniques. Topics include imaging and X-ray spectroscopy using scanning electron microscopy; imaging, diffraction, and X-ray spectroscopy using transmission electron microcopy; and advanced X-ray diffraction techniques. Lecture and laboratory. Prerequisite: MSE 643/743

753. **Phase Diagrams**. Analysis and interpretation of binary, ternary, and more complex phase diagrams including thermodynamic basis and construction. Prerequisite: MSE 381.

767. **Process Modeling and Simulation for Lightweight Materials**. 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. Prerequisites: MSE 401 or ME 405, MA 227

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

Materials Science (Ph.D.)

*UAB, the University of Alabama (Tuscaloosa), and the University of Alabama in Huntsville offer a joint, interdisciplinary program leading to the Ph.D. degree in materials science.

Degree Offered:	Ph.D.*
Director:	Dr. Gregg M. Janowski
Phone:	(205) 934-8450
E-mail:	**janowski@uab.edu**
Web site:	**www.eng.uab.edu**

UAB Faculty

J. Barry Andrews, Professor (Materials Science and Engineering); Solidification, Microgravity Processing, Physical Metallurgy, Intermetallic Materials, Electronic Properties

Renato Camata, Assistant Professor (Physics), Pulsed Laser Deposition, Nanostructured Materials, Biomaterials

Aaron Shane Catledge, Research Assistant Professor (Physics), Hard Carbon Films, Nanostructured Diamond, Homoepitaxial Diamond Growth, Transport Measurements

Krishan K. Chawla, Professor (Materials Science and Engineering); Metal-, Ceramic-, and Polymer-Matrix Composite Materials; Fibers, Interfacial Phenomena

Juan P. Claude, Assistant Professor (Chemistry); Electrosynthesis and Photophysics of Semiconductor Nanoparticles

Derrick R. Dean, Associate Professor (Materials Science and Engineering); Structure-Property Relationships of Polymers and Multiphase Polymer Systems

Lawrence J. DeLucas, Professor (Optometry); Microgravity Processing of Protein Crystals

Alan Eberhardt, Associate Professor (Biomedical Engineering); Solid Mechanics, Analytical and Numerical Methods, Biomechanics

Dale S. Feldman, Associate Professor (Biomedical Engineering); Porous Polymeric Soft-Tissue Implant Biocompatibility, Biodegradable Composites, Biomechanics

Gary M. Gray, Associate Professor (Chemistry); Synthesis, Characterization and Applications of Inorganic Polymers

Robin D. Griffin, Associate Professor (Materials Science and Engineering); Electron Microscopy, Physical Metallurgy

Tracy P. Hamilton, Associate Professor (Chemistry); Chemistry of Small Atom Clusters and Interactions

Joseph G. Harrison, Associate Professor (Physics); Energy-Band Structure, Electronic Structure of Defect Systems, Molecular Metals

Gregg M. Janowski, Associate Professor (Materials Science and Engineering); Electron Microscopy, Composite Materials, Physical Metallurgy, Structure-Processing-Property Relationships

Chris Lawson, Professor (Physics); Nonlinear Optics, Fiber Optics, Optical Fibers

Jack E. Lemons, Professor (Dentistry); Design of Ligament and Tendon Prostheses, Development of Synthetic Bone Products

Burton R. Patterson, Professor (Materials Science and Engineering); Powder Processing, Physical Metallurgy, Composite Materials, Quantitative Microscopy

E. Douglas Rigney, Professor (Biomedical Engineering); Corrosion, Biomaterials, Metal-Ceramic Interfaces

Rosalia N. Scripa, Professor (Materials Science and Engineering); Ceramics and Glass, Extractive Metallurgy, Semiconductor of Crystal Growth, Electronic-Magnetic Materials

David L. Shealy, Professor (Physics); X-ray Telescopes, Microscopes and Lithography, Optics, Free Electron Lasers

Andrei Stanishevsky, Assistant Professor, (Physics), Processing, Characterization and Applications of Thin Films and Structures

Yogesh K. Vohra, Professor (Physics); Thin Diamond Films, Laser and X-ray Characterization of Materials at Extreme Conditions

Mary Ellen Zvanut, Professor (Physics); Electrical Studies and EPR Studies of Insulators and Semiconductors

Participating Faculty from the University of Alabama (Tuscaloosa)

Viola Acoff, Professor (Metallurgical and Materials Engineering); Physical Metallurgy, High Temperature Materials, Electron Microscopy, Welding

Martin G. Bakker, Associate Professor (Chemistry); Physical Chemistry; Electron Paramagnetic Resonance, Surfactants

Mark E. Barkey, Associate Professor (Aerospace Engineering and Mechanics); Structural Durability and Fatigue Performance;

Richard C. Bradt, Professor (Metallurgical and Materials Engineering); Ceramic Materials

Michael P. Cava, Ramsay Professor Emeritus (Chemistry); Organic Conductors, Synthetic Methods

Peter Clark, Associate Professor (Chemical Engineering); Fluid Rheology, Flow of Fluid Complex Mixtures-Slurries, Emulsions, and Gels

William D. Doyle, Professor (Physics); Magnetic Materials and Devices for Information Storage

Nagy H. El-Kaddah, Professor (Metallurgical and Materials Engineering); Materials Process Modeling

James W. Harrell, Jr., Professor (Physics); Nuclear Magnetic Resonance of Molecular Motions in Solids

Stanley E. Jones, Cudworth Professor (Aerospace & Mechanics); Plasticity Analysis, Nonlinear Mechanics, and Applied Mathematics

Lowell D. Kispert, Research Professor (Chemistry); Structure of Free Radicals in Single Crystals, Magnetic Resonance Methods, Conducting Polymers, Solid-State Photochemistry

Gary Mankey, Associate Professor (Physics); Nanostructure Ferromagnets

Robert M. Metzger, Professor (Chemistry); Solid-state Chemistry, Organic Conductors, X-ray Crystallography, Solid-State Theory

David Nikles, Professor (Chemistry); Chemistry, Application of Materials for Optics and Information Technology, Optical Data Storage, Flexible Magnetic Media

Raghvendra K. Pandey; Cudworth Professor (Electrical and Computer Engineering); Bulk Single Crystal and Thin Film Growth of Electronic Materials, Integrated Structures and Devices

Ramana Reddy, ACIPCO Professor (Metallurgical and Materials Engineering); High-Temperature Materials Processing, Thermodynamics

Sanjoy K. Sarker, Associate Professor (Physics); Statistical Mechanics and High-Field Effects in Semiconductors

Doru M. Stefanescu, Cudworth Professor and University (Metallurgical and Materials Engineering); Nucleation and Growth in Solidification Processes, Physical Chemistry of Surface and Interface Reactions

Shane C. Street, Assistant Professor (Chemistry); Analytical Chemistry; Ultrathin Oxide Films; Tribology

Pieter B. Visscher, Professor (Physics); Metals Physics, Viscoelastic Properties of Materials

Garry W. Warren, Professor (Metallurgical and Materials Engineering); Corrosion and Surface Electrochemistry

Mark Weaver, Associate Professor (Metallurgical and Materials Engineering); Microstructure-Property Relations; Intermetallic Compounds; Structural Materials; Thin Films; Materials Characterization

Participating Faculty from the University of Alabama in Huntsville

James K. Baird, Professor (Chemistry); Theory of Ostwald Ripening, Electron Transport, Radiation Effects

Ramon Luis Cerro, Professor (Chemical and Materials Engineering); Langmuir-Blodgett Ultrathin Films, Capillary Hydrodynamics

Liqing Chen. Assistant Research Professor (Chemistry); X-ray Crystallography, Structural Biology, Structural Genomics, Structure-Based Drug Discovery And Development.

Krishnan Chittur, Associate Professor (Chemical and Materials Engineering); Biological Thin Films, Polymer Films

Enrico L. DiGiammarino, Assistant Research Professor (Chemistry); Tumor Suppressor Proteins, NMR, Structure of Proteins

John Dimmock, Professor (Physics); Polymers, Composites, Fluid Dynamics, Electromagnetic Scattering and Antennae

Stephen Edmondson, Associate Research Professor (Chemistry); Thermodynamics, Structure of Proteins and Nucleic Acids

Andreas Gebauer, Assistant Professor (Chemistry); Interests: Inorganic Metal Complexes, Three Dimensional Non-Covalent Compounds, NMR, Electrochemical Methods

Michael A. George, Assistant Professor (Chemistry); Interactions Between Adsorbate Layers and Surfaces of Thin Films

John C. Gregory, Professor (Chemistry); Interaction of Atomic Oxygen and High-Energy Particles with Surfaces and Bulk Materials

Douglas G. Hayes, Associate Professor (Chemical and Materials Engineering); Enzymatic Reactions in Nonaqueous media, Protein Behavior at Interfaces, Microemulsions, Lipid Chemistry

William F. Kaukler, Assistant Research Professor (Chemistry); Solidification, X-ray microscopy of solidification dynamics

Edward J. Meehan, Jr., Professor (Chemistry); Crystal Growth of Proteins, X-ray Crystallography of Protein Single Crystals

Robert J. Naumann, Professor (Chemistry); Crystal Growth in Low Gravity, Space Processing

Carmen Scholz, Assistant Professor (Chemistry); Green Chemistry, Biodegradable Biomaterials

John Shriver, Professor (Chemistry); Protein Structure and Stability, NMR, Microcalorimetry, Thermophile Protein

William N. Setzer, Professor (Chemistry); NMR and X-ray Conformational Analysis of Novel Organic Compounds

James E. Smith, Professor (Chemical and Materials Engineering); Catalysis, Powder Metals

Bernhard Vogler, Assistant Professor (Chemistry); NMR Analysis of Biological Molecules.

Jeffrey Weimer, Associate Professor (Chemistry); Surface Banding Studies

Francis C. Wessling, Professor (Mechanical and Aerospace Engineering); Space Processing of Materials

Admission

Admission into the materials science graduate program through UAB is by recommendation of the UAB Materials Science Program Committee. On acceptance into the program, the student will be affiliated with a "host" department. Assistantships can be awarded either by the host department or by the materials science program. Until a student has chosen a mentor, the Materials Science graduate program director, or his or her designate, will advise the student.

Course Work

Students enter this program with diverse undergraduate training in engineering, physical, or biological sciences. The multidisciplinary curriculum has been structured to develop a common philosophy of the interrelationship of structure, properties, and synthesis of materials. The program committee can waive some course work for a student entering the program with a master's degree in an appropriate discipline.

During the first phase of instruction (usually 12 semester hours), the student is expected to acquire a core of knowledge in materials science through formal course work and independent study. The core is divided into four topical areas: (1) structure and analysis; (2) condensed matter science; (3) thermodynamics and kinetics; and (4) structure, processing, and properties. Each student's background will be evaluated in order to develop an individual program of study, which may involve some undergraduate course work to satisfy prerequisites for graduate courses and to provide sufficient breadth of coverage of the core areas. To complete this phase, the student must pass Program Examination I which is offered twice per year. The student is expected to choose a mentor before completion of Program Examination I.

The second (specialization, normally 24 semester hours) and the third (electives, 12 semester hours) phases of the curriculum are planned by the student and the research adviser, with approval of the student's graduate study committee. Available areas of specialization are (1) structure and properties of materials; (2) macromolecular materials; (3) electronic, optical, and magnetic materials; (4) materials processing; (5) biomaterials or (6) mechanical behavior of materials.

Courses may be taken at UAB, the University of Alabama (Tuscaloosa), or the University of Alabama in Huntsville. Near the end of the formal course work, the student must pass a comprehensive examination (Program Examination II) set by the student's graduate committee and present a dissertation proposal.

Foreign Language Requirement

Each student is required to demonstrate reading proficiency in a foreign language or proficiency in a technique or skill that is a useful adjunct to the research degree. In the case of a foreign language, competency will be established by an examination that consists of the student translating (with dictionary) a research article, chosen by the student's graduate study committee. A pass/fail determination will be made by the student's graduate study committee after receiving an assessment of merit from a foreign language professor. The language chosen may not be the native tongue of the student and must be from the following list: Chinese, French, German, Japanese, or Russian. A particular research technique or skill must be approved by the student's graduate study committee.

Program Completion

Since the Ph.D. is a research degree, all students are expected to acquire most of their advanced knowledge through research training. These activities will be directly supervised by the student's mentor. The student will write a dissertation and defend it by oral examination.

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**.

Additional Information

Deadline for Entry Term(s):	Each semester and 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	None
Graduate Catalog Description	**http://main.uab.edu/show.asp?durki=24907**

For detailed information, contact Dr. Gregg M. Janowski, Graduate Program Director, The University of Alabama at Birmingham, Department of Materials Science and Engineering, BEC 254, 1530 3rd Avenue South, Birmingham, AL 35294-4461.

Telephone: 205-934-8450,

E-mail: **janowski@uab.edu**

Web **www.eng.uab.edu**

Course Descriptions

UAB Courses

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.

Courses at UAB have the following prefixes:

Biomaterials CD	(Clinical Dentistry)
Biomedical Engineering	BME
Chemistry	CH
Materials Science and Engineering	MSE
Physics	PH

A partial list of courses that prepare students for Program Examination I (See program director for reading list) is as follows:

Structure and Analysis

BME 716	Instrumental Methods of Analyses.
CH 580	Polymer Chemistry for Graduate Study I.
CH 730	Physical Organic Chemistry I.
CH 740	Bonding and Structure in Inorganic Compounds.
MSE 464	Characterization of Materials. 4 hours.
MSE 743	Materials Characterization I.
MSE 744	Materials Characterization II.
PH 745	Molecular Spectroscopy.

Condensed Matter Science

CD 661	Physical Properties of Biomaterials.
CH 725	Molecular Structure and Spectroscopy.
PH 753	Advanced Solid State Physics I.
PH 754	Advanced Solid State Physics II.
PH 771	Quantum Mechanics I.
PH 772	Quantum Mechanics II.

Thermodynamics and Kinetics

CH 729	Special Topics in Physical Chemistry. 1-3 hours.
MSE 703	Thermodynamics of Materials.
PH 635	Statistical Mechanics.

Structure, Processing, and Properties

CH 580	Polymer Chemistry I for Graduate Study.
MSE 280	Engineering Materials.
MSE 281	Physical Materials I.
MSE 381	Physical Materials II.
MSE 570	Ceramic Materials.

A partial list of courses for each specialization is given below. Additional courses may be accepted at the discretion of the graduate committee.

Specialization 1: Structure and Properties of Materials.

Must include 3 hours in instrumentation, 3 hours in methods of chemical analysis, and 3 hours in spectroscopy.

BME 542	Principles of Medical Imaging
BME 546	Principles of MRI
BME 716	Instrumental Methods of Analyses
BME 742	Medical Imaging Instrumentation
CH 729	Special Topics in Physical Chemistry
CH 749	Special Topics in Inorganic Chemistry
CH 750	Advanced Analytical Chemistry
CH 751	Advanced Analytical Chemistry II
CH 755	Electroanalytical Chemistry
CH 757	Analytical Spectroscopy
MSE 703	Thermodynamics of Materials
MSE 718	Surfaces, Interfaces, and Thin Films
MSE 737	Quantitative Microscopy
MSE 743	Materials Characterization I
MSE 744	Materials Characterization II
MSE 753	Phase Diagrams

Specialization 2: Macromolecular Materials.

Must include 3 hours in advanced inorganic or organic chemistry, 3 hours in macromolecular chemistry, and 3 hours in macromolecular physics.

BME 511	Polymers for Biomedical Applications I
BME 520	Tissue Interactions
BME 712	Polymers for Biomedical Applications II
BME 750	Implants in Dentistry
CH 580	Polymer Chemistry I for Graduate Study II
CH 581	Polymer Chemistry II for Graduate Study II
CH 729	Special Topics in Physical Chemistry
CH 739	Special Topics in Organic Chemistry

Specialization 3: Electronic, Optical, and Magnetic Materials.

Must include 3 hours in spectroscopy and 6 hours in the electronic, optical, or magnetic properties of materials.

CH 729	Special Topics in Physical Chemistry
CH 743	Chemical Applications of Group Theory
CH 744	Spectroscopy of Inorganic Chemistry
MSE 584	Electronic, Magnetic and Thermal Properties of Materials
MSE 718	Surfaces, Interfaces, and Thin Films
MSE 743	Materials Characterization I
PH 623	Modern Optics I
PH 655	Advanced Solid State Laboratory
PH 715	Advanced Statistical Mechanics
PH 741	Mössbauer Spectroscopy
PH 742	Electron Spin Resonance
PH 750	Classical Electrodynamics I
PH 751	Classical Electrodynamics II
PH 753	Advanced Solid State Physics I
PH 754	Advanced Solid State Physics II
PH 760	Methods of Mathematical Physics
PH 762	Computational Physics

Specialization 4: Materials Processing.

Must include 6 hours in solidification or crystal growth and 3 hours in processing technology.

CD 633	Alloy Systems in Dentistry
MSE 503	Materials Processing
MSE 713	Mechanical Behavior of Materials
MSE 715	Nucleation and Growth
MSE 716	Microstructural Processes

MSE 718	Surfaces, Interfaces, and Thin Films
MSE 723	Solidification
MSE 753	Phase Diagrams

Specialization 5: Biomaterials.

Must include 6 hours in the structure and properties of biomaterials and 3 hours in biomaterials applications.

BME 511	Polymers for Biomedical Applications I
BME 520	Implant Tissue Interactions
BME 712	Polymers for Biomedical Applications II
BME 750	Implants in Dentistry
BME 753	Ceramic Materials in Dentistry
BME 754	Alloy Systems in Dentistry
BME 790	Special Topics in Biomaterials, 1-6 hours
BME 791	Individual Study in Biomaterials, 1-6 hours
CD 626	Surgical Implants in Dentistry
CD 629	Ceramic Cements, Alloy-Ceramic Systems
CD 633	Alloy Systems in Dentistry
CD 661	Physical Properties of Biomaterials
CD 662	Laboratory Methods for Biomaterials Research

Specialization 6: Mechanical Behavior of Materials.

Must include 3 hours in ceramic, metallurgical, or polymer engineering, 3 hours in the mechanical behavior of materials, and 3 hours in the characterization of materials.

BME 716	Instrumental Methods of Analyses
BME 733	Tissue Mechanics
BME 737	Biomechanics: Tissue Mechanics II
BME 776	Fracture Mechanics
MSE 713	Mechanical Behavior of Materials
MSE 737	Quantitative Microscopy
MSE 743	Materials Characterization I
MSE 744	Materials Characterization II
PH 610	Classical Mechanics I
PH 611	Classical Mechanics II
PH 710	Advanced Classical Mechanics I
PH 711	Advanced Classical Mechanics II

Mechanical Engineering (Ph.D.*, M.S.M.E.)

*Degree awarded by The University of Alabama and The University of Alabama in Huntsville.

Degree Offered:	Ph.D.*, M.S.M.E.
Director:	David L. Littlefield
Phone:	(205) 975-5882
E-mail:	**littlefield@uab.edu**
Web site:	**www.eng.uab.edu**

Faculty

Andreas Anayiotos, Associate Professor, (Biomedical Engineering); Biofluids, Dynamics of the Vascular System

Heng Ban, Associate Professor (Mechanical Engineering); Pollution Control, Combustion, Thermal-Fluid Science

Charles Bates , Research Professor (Materials Engineering); Casting and Solidification Processes

Krishan K. Chawla , Professor (Materials Engineering); Metal, Ceramic, and Polymer Matrix Composite Materials; Fibers, Interfacial Phenomena

Gary Cheng,, Assistant Professor (Mechanical Engineering); Computational Fluid Dynamics, Multi-phase Combustion

Martin Crawford, Professor Emeritus (Mechanical Engineering); Heat Transfer, Fluid Mechanics, Thermodynamics, Air Pollution Control

Alan Eberhardt, Associate Professor, (Biomedical Engineering); Solid Mechanics, Analytical and Numerical Methods in Biomechanics

Evangelos C. Eleftheriou, Research Associate Professor (Mechanical Engineering); Mechanical Systems, Automated Manufacturing, Mechanical Design

Jay Goldman, Professor (Engineering); Administrative Organization and System Design for Productivity and Quality Enhancement in Manufacturing and Service Industries

Roy P. Koomullil., Assistant Professor (Mechanical Engineering); Computational Fluid Dynamics, Turbulence and Flow Modeling Using Generalized Grids.

Anne McClain, Research Assistant Professor, (Mechanical Engineering); Computational manufacturing, Crash Worthiness Simulations, Materials Analysis

Stephen T. McClain, Assistant Professor, (Mechanical Engineering); Energy Systems, Boundary Layer Flow, Conduction and Convection Heat Transfer

Robert H. Nichols, Research Associate Professor (Mechanical Engineering); Computational Fluid Dynamics, Turbulence Modeling, Grid Generation Software

Ralph W. Noack, Research Associate Professor (Mechanical Engineering); Computational Fluid Dynamics, Grid Generation, Visualization Methods, Parallelizing Software

Alan Shih, Research Associate Professor (Mechanical Engineering); Computational Fluid Dynamics, Mesh Generation, Visualization Systems and Software

Bharat Soni, Chair and Professor, (Mechanical Engineering); Computational Structures and Fluid Dynamics, Mesh Generation.

B. J. Stephens, Associate Professor (Mechanical Engineering); Mechanical Systems, Machine Design, Vibration Control, Advanced Stress Analysis

Thomas F. Talbot, Professor Emeritus (Mechanical Engineering); Mechanical Systems, Metallurgical Failure Analysis, Manufacturing Processes

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

The GRE aptitude test scores must meet a quantitative portion score of 700 and a minimum score of 500 on the verbal portion. In addition, for foreign nationals, a minimum score of 550 (245 for computer version) 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 the following required courses: ME 650, Transport Phenomena and ME 670, Advanced Mechanical Design;
- Six semester hours in approved mathematics courses;
- A minimum of 12 semester hours in committee-approved mechanical engineering courses or approved related courses.

2. The student must successfully complete and defend a thesis. The thesis student must register for at least 9 hours of ME 699 (Master's Thesis Research) in addition to the 24 semester hours of coursework.

PLAN II (Nonthesis Option): Research/Design Emphasis

The election of Plan II must be approved by the student's graduate study committee. 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.

1. The student must successfully complete at least 33 semester hours of coursework, including

- Six semester hours in the following required courses ME 650, Transport Phenomena and ME 670, Advanced Mechanical Design;
- A minimum of 21 semester hours of approved mechanical engineering courses or approved related courses (the 21 hours must include at least 3 semester hours of ME 698, Nonthesis Research, involving design or research);
- Six semester hours in approved mathematics courses.

2. The student must pass a written comprehensive examination on coursework taken in the program.

PLAN II (Nonthesis Option): Technology/Engineering Management Emphasis

1. The student must successfully complete at least 33 semester hours of coursework, including

- Six semester hours in the following required courses: ME 650, Transport Phenomena and ME 670, Advanced Mechanical Design;
- Six semester hours in one of the following two management applications areas: MBA 660, Quantitative Methods I, and either EC 520, Applied Forecasting, or another approved advanced management course;
- Three semester hours in MBA 632, Organizational Behavior;
- Three semester hours in ME 698, Nonthesis Research, involving design or research.
- Nine semester hours of engineering-oriented management coursework. Approved courses include CE 558, 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.
- Three semester hours in an approved mathematics course.

2. The student must pass a written comprehensive examination on coursework taken in the program.

Ph.D. Program

UAB cooperates in programs leading to the Ph.D. degree in mechanical engineering awarded by the University of Alabama (Tuscaloosa) or by the University of Alabama in

Huntsville. The student's advisory committee will be composed of faculty from the UAB graduate program in mechanical engineering, together with graduate faculty from the cooperating institution. In determining the student's program, the advisory committee will consider the student's academic objectives and background. Coursework may be taken at UAB and/or the cooperating institution. More detailed information can be obtained from the cooperative program agreement with the degree-granting institution.

Ph.D. Program in Environmental Health Engineering

This unique, interdisciplinary program takes advantage of UAB's diversified engineering school, and nationally renowned health sciences center, to produce Ph.D. candidates cross-trained in public health and environmental engineering from a variety of disciplines. The program provides students with an understanding of mechanisms through which agents alter environmental, human, and ecosystem health, and the integrated experimental and simulation based technology skills needed to evaluate, manage, and mitigate environmental problems, in the context of engineering and public health.

The program requires at least 42 credit hours of classroom work, plus 18 credit hours of dissertation research beyond the baccalaureate level. Courses of full graduate-level credit earned in an accredited institution where a student was enrolled in the graduate school, may be submitted for review for inclusion in the doctoral program. With approval, up to one-half of the required classwork for the doctoral degree may be transferred from another institution or another program. Successful completion of a qualifying exam, dissertation, and final defense is required of all doctoral candidates.

For more detailed information, please refer to the listing under Engineering, Environmental Health, or contact Dr. Melinda M. Lalor, Program Director for Environmental Health Engineering, 210C Hoehn Engineering Building, 1075 13th Street South, telephone 205-934-8438, e-mail **mlalor@uab.edu**.

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 student's undergraduate degree.

ME 241 Thermodynamics I

ME 321 Fluids and Heat Transfer I

ME 322 Fluids and Heat Transfer II

ME 360 Controls

ME 370 Kinematics and Dynamics of Machinery

ME 371 Machine Design I

CE 220 Mechanics of Solids

Additional Information

Deadline for Entry Term(s):	Consult program director for information
Graduate Catalog Description	**http://main.uab.edu/show.asp?durki=24877**

For detailed information, contact Dr. David Littlefield, Department of Mechanical Engineering, HOEN 330A, 1530 3rd Avenue South, Birmingham, Alabama 35294-4440.

Telephone 205-975-5882.

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

Web **www.eng.uab.edu**

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit.

Mechanical Engineering (ME)

506. **Jigs and Fixture Design**. Design considerations of jigs and fixtures for variety of manufacturing processes. Prerequisite: Permission of instructor.

507. **Fundamentals of Tool Design**. Aspects of tool design rapid prototyping and rapid tooling for die design, machining, inspection, and gauging presented through lectures and projects. Prerequisite: Permission of instructor.

508. **Metrology and Quality Control**. Aspects of precision measurement, inspection and gauging, and design of experiments. Short lectures and experiments with modern-day quality-control instrumentation. Prerequisite: Permission of instructor.

514. **Introduction to Computational Fluid Dynamics**. Basic numerical analysis techniques; quasi-linearization, consistency, convergence, accuracy, and Von Neumann error analysis. Prerequisites: ME 130 and 321.

515. **Compressible Fluid Flow**. Application of thermodynamics and fluid mechanics to perfect gas flow. Prerequisites: ME 322.

520. **Fluid Measurements**. Theory and techniques for measurement of static and dynamic fluid and flow properties. Prerequisite: ME 322.

521. **Fluid Machinery**. Fluid mechanics of fluid machinery such as turbines, pumps, compressors, fans, blowers, and gas turbine engines. Prerequisite: ME 322.

525. **Air Pollution Principles**. Theory of operation, design, and application of various methods of air-pollution control. Prerequisite: Graduate standing.

547. **Solar Energy**. Applications of solar energy to heating, cooling, and power generation. Solar radiation effects, thermodynamic and heat transfer effects in solar power equipment. Prerequisite: ME 322 or permission of instructor.

548. **Internal Combustion Engines**. Reciprocating internal combustion engines, emphasizing chemical, thermodynamic, and fluid dynamic processes. Stress on 4-stroke engines; some study of 2-stroke engines included. Prerequisite: ME 322 or permission of instructor.

549. **Steam Power Generation**. Application of thermodynamic principles to steam power systems with both fossil and nuclear fuels. Prerequisite: ME 242.

555. **Heat Transfer Equipment**. Regenerative, recuperative and direct-contact heat exchangers, heat pipes, and insulation theory. Applications to energy conversion and conservation. Prerequisites: ME 322.

564. **Introduction to Finite Element Method**. Concepts and applications of the finite element method. Development and applications of basic finite elements. Software use. Prerequisite: CE 220.

566. **Optimal Design Techniques**. Optimization of both single and multiple variable functions, constrained and unconstrained. Prerequisites: Graduate standing; knowledge of a computer language desirable.

573. **Friction and Wear**. Mechanisms; bearing analysis and design; lubrication theory and applications; damage analysis. Prerequisite: Graduate standing in engineering.

576. **Failure Analysis**. Failure mechanism; service failures and methods employed to prevent failures. Prerequisites: MSE 280, CE 220, and CE 221.

577. **Design Synthesis**. Integration of ideas, concepts, and fundamentals of science and engineering into preliminary design; synthesis of technical, human, and economic actors. Mathematical modeling and design optimization. Prerequisites: ME 370 and 471.

579. **Advanced Mechanics**. Variation of stress at point; determination of principal and maximum shear stresses. Symmetrical deformation; thick-wall cylinders and rotating disks. Torsion of noncircular sections; curved beams. Prerequisites: CE 220 and 221.

601. **Design, Measurement, and Enhancement of Work Systems**. Systems involving human performance. Prerequisite: CE 220 or permission of instructor.

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 a viscous fluid. Laminar boundary layers.

612. **Advanced Fluid Mechanics II**. Turbulent flow study, turbulent flow modeling, numerical solutions. Prerequisite: ME 611.

614. **Computational Fluid Dynamics of Incompressible Flow**. Mathematics of viscous, incompressible NS equations, numerical treatment of advection and diffusion, grid systems, and survey of algorithms for solving NS equations. Prerequisites: ME 414 or 514, or permission of instructor.

615. **Introduction to Turbulent Flows**. Computational aspect of modeling; Reynolds-averaged equations, turbulent boundary layers, turbulence simulation. Prerequisite: Permission of instructor.

640. **Classical Thermodynamics I**. Macroscopic thermodynamics, first- and second-law formulation, entropy generation and energy, general relations for single-phase and multi-phase systems.

641. **Classical Thermodynamics II**. Classical treatment of chemically reactive systems, power generation, solar energy, refrigeration and thermodynamic design principles. Prerequisite: ME 641.

642. **Statistical Thermodynamics**. Application of statistical mechanics to thermodynamic processes.

650. **Transport Phenomena**. A fundamental introduction to heat, momentum, and mass transfer. Derivation of governing equations. Discussion of fundamental assumptions and simplifications.

651. **Radiation Heat Transfer**. Laws of thermal radiation, geometrical and spectral characteristics, electrical analogy, gaseous radiation.

652. **Conduction Heat Transfer.** General conduction equation; methods of solution. Steady-state, transient, and periodic heat flow; internal heat generation.

653. **Convection Heat Transfer**. Convection problems, including boundary layer problems in laminar and turbulent flow.

656. **Boiling and Condensation Heat Transfer**. Thermodynamic and heat transfer details of boiling and condensation phenomena. Prerequisites: Graduate standing and permission of instructor.

670. **Advanced Mechanical Design**. Design of special machines. Strength and stiffness of machine components. Modern industrial techniques for selection of drive systems, keys, pins, shafts, gears, bearings, and brakes. Prerequisite: Permission of instructor.

671. **Computer-Aided Dynamic Analysis**. Numerical methods and computer-aided design; analysis of both plane and spatial systems. Prerequisite: ME 370 or permission of instructor.

672. **Rotor Bearing Dynamics**. Rigid and nonrigid models; coupled motion between rotating and stationary structures. Prerequisite: ME 370 and 371, or permission of instructor.

674. **Advanced Lubrication**. Journal bearings. Hydrostatic/hydrodynamics theories. Stability and operating characteristics. Prerequisite: Permission of instructor.

676. **Fracture Mechanics**. Linear elastic fracture mechanics. Griffith energy balance. Airy and Westergaard solutions. Elastic-plastic fracture mechanics. Materials testing and applications. Prerequisite: Graduate standing.

678. **Theory of Elasticity**. Continuum mechanics; stress/strain tensors; 2-D elasticity; Airy methods, polar coords, Lame's problem, singularities, Green's functions. Prerequisites: CE 220 and 221.

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. **Seminars in Mechanical Engineering**. 1 hour.

698. **Nonthesis Research**. 1-8 hours.

699. **Master's Thesis Research**. Prerequisite: Admission to candidacy. 1-8 hours.

GRADUATE SCHOOL

Graduate School Professional Development Program

Program director: *Austin*

Faculty

Nancy G. Abney; English as a Second Language, TA Training

Julia S. Austin; Program Director, English as a Second Language, Faculty-Teacher Development, Academic Writing, TA Training

Alan D. Corbin; English as a Second Language, Presentation and Discussion Skills

Jeffrey Engler; Career Development, Extramural Funding

Jennifer Greer; Academic Writing, English as a Second Language

Jonghee Shadix; Pronunciation and Accent Training

Program Information

These courses and workshops are offered to improve the academic and professional communication skills of graduate students and postdoctoral fellows and to provide language and cultural support for international graduate students.

Additional Information

For detailed information, contact Dr. Julia S. Austin, HUC 511, 1530 3rd Avenue South, Birmingham, Alabama 35294-1150.

Telephone 205-975-6539

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

Web **www.uab.edu/profdev**

Course Descriptions

Graduate School (GRD)

701. **Presentation and Discussion Skills**. Develops professional communication skills, including public speaking skills, conversation management, register shifting, and overall comprehensibility. Videotaped presentations critiqued individually by instructor. Fall and Spring. Pass/Fail.

704. **Specialized Instruction**. Addresses particular writing needs of students actively writing theses, dissertations, articles for publication, grant proposals or pronunciation concerns of second language students. Individual instruction. Prerequisite: Permission of program director. Every semester. 1-5 hours. Pass/Fail.

705. **Teaching at the College Level and Beyond**. Introduces many of the basic principles needed to teach effectively at the college level and addresses current issues relevant to college teaching. Topics include creating a learning environment, course and syllabus design, effective lecturing, active learning approaches, evaluation and grading, and using technology to enhance learning. Spring. 2 or 3 credit hours. Pass/Fail.

709. **Fellowship Writing.** Provides hands-on assistance with preparation of a fellowship or grant application. Participants are introduced to ways to search for funding sources, then locate an appropriate source and complete the application. Spring. 3 credit hours. Pass/Fail.

712. **Research Writing and Style**. Teaches effective strategies of successful writers. Topics include the different types of writing that students and professionals do (such as abstracts, proposals, journal articles, progress reports, and correspondence), publishing, and ethical issues related to writing and publication. Summer. 3 credit hours. Pass/Fail.

714. **Individualized Pronunciation Instruction**. Prerequisite: GRD 720/721, 724, or 730. Addresses individual pronunciation needs of students who have acquired basic speaking skills. The course includes a thorough diagnostic and goal-setting session, followed by one-to-one instruction in the sounds and rhythms of English, including computer-assisted language mapping and techniques used by professional actors. Spring/Summer/Fall. 3 to 5 credit hours. Pass/Fail.

715. **Preparing TAs to be Effective Teachers**. 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/Fail.

717. **Principles of Scientific Integrity**. Surveys ethical issues and principles in the practice of science. Fall and Spring. 3 credit hours. Pass/Fail.

720. **Oral Communication I**. Prerequisite: Intermediate Low-Mid Score on UAB-adapted OPI Assessment. Helps Intermediate speakers become more active in scholarly discussions by learning how to clearly, confidently, and accurately express their ideas. Lab work consists of listening to presentations and interviews on a variety of current topics, with discussion. First of a 2-course sequence. Fall, Spring, and Summer. 3 credit hours. Pass/Fail.

721. **Oral Communication II**. Prerequisite: GRD 720. Helps students improve pronunciation and grammatical accuracy and enhance fluency while discussing issues of global interest and by delivering impromptu, problem-solution, and

informative presentations. Second of a 2-course sequence. Fall, Spring, and Summer. 3 credit hours. Pass/Fail.

724. Pronunciation and Accent Workshop. Prerequisite: GRD 720/721 or 730. This course introduces students to the foundations of English phonology. By interacting with peers, students identify and enhance their strengths and weaknesses in terms of pronunciation of individual sounds and the natural countours of English. 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/Fail.

725. **Advanced Pronunciation and Accent Workshop.** Prerequisite: GRD 724 and GRD 714. This course is for those studens who have completed the individualized instruction 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 of the speech 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/Fail.

726. **Academic Writing I.** Prerequisite: Level 3 Intermediate on UAB ESL Writing Assessment. Introduces students to the writing process, the elements of effective writing, common academic texts, ethics, peer review, and techniques for efficient editing. Based on guided activities, independent practice, and small-group work with instructor feedback, it is the first of two courses on writing academic journal-style articles. Instruction also addresses key grammatical issues for second language writers. First of a 2-course sequence. Fall, Spring, and Summer. 3 credit hours. Pass/Fail.

727. **Academic Writing II.** Prerequisite: GRD 726. Builds upon students' knowledge of the writing process and peer review while learning to paraphrase, summarize, write literature reviews, and construct research articles. Activities include text analysis, writing practice, review, and revision as students model professional strategies. Instruction addresses key grammar issues for second language writers. Second of a 2-course sequence. Fall, Spring, and Summer. 3 credit hours. Pass/Fail.

728. **Advanced Academic Writing.** Prerequisite: Level 4 Advanced on UAB ESL Writing Assessment or GRD 727. Reviews U. S. academic writing genres, standards, and conventions. Fast-paced with text analysis and guided practice, this course covers the writing of conference abstracts, posters, literature reviews, and research papers as students model professional strategies. Embedded language instruction addresses key grammar issues for second language writers. Fall, Spring, and Summer. 3 credit hours. Pass/Fail.

730. **Advanced Oral Communication.** Prerequisite: Intermediate High or Advanced on UAB-adapted OPI Assessment. Prepares participants for the kinds of communication they are expected to perform as part of their professional

duties—articulating and supporting one's ideas in discussions; sharing and debating scholarly projects with colleagues; and delivering formal talks at professional meetings. Fall, Spring, and Summer. 3 credit hours. Pass/Fail.

Workshops

706. **Grants and Fellowships 101**. Introduces the extramural funding process. Topics include types of awards, funding sources, components of an application, the review process, and writing effective grant proposals. Fall. One-day workshop. 1 credit hour. Pass/Fail.

707. **Presenting Effectively**. Provides an overview of giving effective oral presentations in academic and professional settings. Topics include analyzing audience and purpose, characteristics of an effective delivery, giving poster presentations, adjusting to lay audiences, and using technology in presentations. Fall. One-day workshop. 1 credit hour. Pass/Fail.

708. **Writing Successfully**. Addresses issues involved in writing in academic and professional settings. Topics include analyzing audience and purpose, addressing common writing problems, developing effective writing practices, writing for publication, adjusting text for lay readers, and grammar and punctuation for writers. Spring. One-day workshop. 1 credit hour. Pass/Fail.

710. **Career Workshops for Graduate Students.** Teaches the skills required for a successful job hunt inside or outside academe. Spring. One-day workshop. 1 credit hour. Pass/Fail.

711. **Special Topics**. Workshop topics include Intercultural Communication and Word Processing for Theses and Dissertations. See UAB Class Schedule for offerings. 1 credit hour. Pass/Fail.

HEALTH PROFESSIONS

Administration—Health Services (Ph.D.)

Degree Offered:	Ph.D.
Co-Director:	Dr. Robert Hernandez (School of Health Professions)
Co-Director:	Dr. Susan K. Key (School of Business)
Phone:	(205) 934-3113
E-mail:	**phdha@uab.edu**
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

Doug Ayers, Associate Professor (Marketing); Business to Business Marketing, New Product Development

Eta Berner, Professor (Health Informatics); Evaluation of Clinical Decision Support Systems and Other Health Information Technologies

Ted Bos, Professor (Quantitative Methods); Economic Forecasting, International Business and Finance, Pacific Basin Financial Markets

Janet M. Bronstein, Associate Professor (Health Care Organization and Policy); Public Health Policy, Social and Ethical Issues in Health Care, Medicaid

Lowell S. Broom, Professor (Accounting); Alternative Dispute Resolution, Professional Ethics, Fraud Detection and Deterrence

Jeffrey Burkhardt, Associate Professor (Health Services Administration); Health Care Finance, Applied Health Economics

Richard Burns, Professor (Finance); Corporate Finance, Firm Valuation, Small Business Finance

Vicki Cox-Edmondson, Associate Professor (Management): Strategy, Entrepreneurship, Corporate Social Responsibility and Business Ethics, Organizational Behavior, and Constraints Management

Sarah Culver, Associate Professor (Economics); Macro Economic Analysis, International Monetary Theory, and Exchange Rate Theory

Manabendra DasGupta, Associate Professor (Economics); Game Theory, Strategic Decision Making

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

Thomas P. Edmonds, Professor (Accounting); Accounting Education and Instructional Development

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

Sara Helms, Assistant Professor (Economics); Economics of Education, Public Economics, Applied Microeconomics

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

Susan K. Key, JD, PhD. (Professor and Director) Doctoral Program in Administration-Health Services for the School of Business. Associate Professor (Management); Business and Society, Ethics, Business Law, Business Policy and Strategy, International Policy

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

Frank M. Messina, Professor (Accounting); Taxation, Fraud Detection and Deterrence, Professional Ethics

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

Lance Nail, Associate Professor (Finance); Wealth and Value Creation, Mergers and Acquisitions

Steven J. O'Conner, Associate Professor (Health Services Administration); Health Care Policy and Management, Service Quality and Orientation, Stakeholder Analysis

Helmuth Orthner, Professor (Health Informatics); Next Generation Networks; Very High-Speed Communications Systems; Web-Based Informatics for Emergency Medical Care

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

Robert Robicheaux, Professor (Marketing); Marketing Strategy and Retailing

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

Sanjay Singh, Associate Professor (Management); Operations Management, Computer Applications

Tommie Singleton, Associate Professor (Information Systems); Systems Analysis and Design, Forensic Auditing and Systems Structure

Robert E. Stanford, Professor (Economics); Operations Research, Quantitative Methods and Decision Technology in Health Service Organizations

Bryce Sutton, Assistant Professor (Economics); Macro Economic Theory, Healthcare Economics, and Biostatistics

Deborah W. Tanju, Professor (Accounting); Internal Auditing, Financial Accounting

Murat H. Tanju, Professor (Accounting); Financial Accounting, Managerial Accounting

Bor-Yi Tsay, Professor (Accounting); Accounting Information Systems, Cost Management

Richard A. Turpen, Associate Professor (Accounting); Auditing, Financial Accounting, Professional Ethics

Joseph Van Matre, Professor (Economics); Total Quality Management, Health Care Quality Improvement, Statistics

Joe Walker, Associate Professor (Finance); Corporate Finance, Investments, Small Firm Finance

Frank E. Watkins, Associate Professor (Accounting); Tax and Business Law, Stockholder Basis in S Corporations, Capital Gains

Barbara Wech, Associate Professor (Organizational Behavior); Teams, Organizational Commitment

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

Clinical Laboratory Sciences (M.S.)

Degree Offered:	M.S.
Director:	Dr. Janelle M. Chiasera
Phone:	(205) 934-7384
E-mail:	**chiasera@uab.edu**
Web site:	**www.uab.edu/cls**

Faculty

Janelle Chiasera, Director and Associate Professor (Diagnostics and Therapeutic Sciences); Clinical Chemistry

Margaret Fritsma, Associate Professor (Diagnostic and Therapeutic Sciences); Immunohematology; Hemostasis, Clinical Correlations

Pat Greenup, Associate Professor (Diagnostic and Therapeutic Sciences); Clinical Microbiology; Laboratory Operations Management, Infectious Diseases/Biodefense

Linda H. Jeff, Associate Professor (Diagnostic and Therapeutic Sciences); Clinical Microbiology; Immunology, Educational Methodology

Program Information

Program Mission

The faculty members of the Clinical Laboratory Sciences Program (CLS) are committed to service to the community and to providing quality education to prepare students and practitioners for the current and future in Clinical Laboratory Sciences (CLS). 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.

Program Plans

The Master of Science in Clinical Laboratory Science (M.S.) is a full-time graduate degree program with two plans for degree completion: Professional Entry and Advanced Professional. **NOTE:** Beginning Summer semester 2008 and forward the Clinical laboratory science program will no longer be accepting applicants for the advanced professional plan.

Professional Entry

The Professional entry plan is designed for students who hold a Bachelor of Science in biology, chemistry, or a related major, and who are not certified medical technologists and 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 plan requires 24 months as a full-time student for completion of the degree requirements.

M.S. Admission Requirements

In addition to the general Graduate School admission requirements, applicants to the M.S. program must

- Biology, chemistry, or a related major from an accredited college or university if applying for the Professional Entry Plan,
- 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,
- Earn 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,
- If foreign-educated, have a score of at least 550 (or 80 for online version) on the TOEFL, submit a transcript evaluation from World Education Services (WES) at **www.wes.org**, and submit records of recognized certification credentials if appropriate
- If accepted, 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 who are not certified medical technologists should have completed natural science and mathematics courses equivalent to those required for a Bachelor of Science in Medical Technology (described in School of Health Professions Catalog).

Persons with a Bachelor of Science degree may be eligible to register for CLS 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 academic and clinical practice requirements of the Professional Entry Plan 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**.

M.S. Program of Study

The purpose of the program is to prepare graduates with technical, cognitive, interpersonal, and critical thinking skills required of practitioners who are associated with the operations of Laboratory Medicine/Clinical Laboratory Services. The graduates will have completed general, research methods and advanced technical and operational management courses under the direction of a graduate study committee. These courses assist the graduate to design research projects, collect and analyze data, write empirical research reports and narrative review papers, and prepare for various career opportunities related to Clinical Laboratory Sciences and research or marketing the in vitro diagnostics industry.

The M.S. program consists of a minimum of 33 semester hours of advanced graduate academic credit, available as a full-time program. Students must:

- Complete course requirements and achieve defined competencies, must maintain a cumulative GPA of at least 3.0 (A = 4.0), and
- Write and defend a Plan I thesis research proposal and original research paper, OR
- Complete and present a Plan II non-thesis research project

Students complete required general, research, and advanced technical or operational courses and may select electives as explained below:

Professional Entry

Students in the Professional Entry Plan have prescribed courses that fulfill the General, Research, and Advanced sequence of courses. Electives are available.

Additional Information:

Deadline for Entry Term(s):	Fall 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 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 foreign educated applicants

Contact Information

For detailed information, contact Dr. Janelle Chiasera, Associate Professor and Director, Clinical Laboratory Sciences Programs, UAB School of Health Professions, RMSB 432 1705 University Blvd., Birmingham, Alabama 35294-1212.

Telephone 205-934-7384.

Fax 205-975-7302

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

Web **www.uab.edu/cls**

Course Descriptions

All courses require permission of the student's academic advisor. Unless otherwise noted, all courses are for 3 semester hours of credit. Course numbers preceded with one asterisk indicate courses that can be repeated for credit, with defined stipulations. Course numbers preceded with two asterisks indicate courses that are NOT open to non-degree graduate students; all other courses not preceded with two asterisks are open to non-degree graduate students.

Clinical Laboratory Sciences (CLS)

CLS 502. Laboratory Analysis of 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. Prerequisites: MT 400Q or CLS 550Q (or concurrent enrollment) and Permission of Instructor.

****CLS 512. Clinical Laboratory Operations.** -- This course is the study of operations management practices for clinical laboratories. Topics will include applications of the following management practices to the operations of the total testing process: performance management and competency-based management, information management, emerging service sites for diagnostic assay services, services marketing, voluntary and regulatory compliance standards, test utilization and critical pathways applications focused on outcomes and patient safety and emerging IVD technologies. Prerequisites: CLS 606, 607, 608, 609, 612 or concurrent enrollment. 2 hours.

CLS 520. Clinical Chemistry I. --Principles and methods of analysis of biochemical metabolites used in medical laboratories; instrumentation; automation and instrument problem solving; accreditation; 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. Prerequisites: Organic Chemistry, MT 400Q or CLS 550Q or concurrent enrollment and Permission of Instructor. 4 hours.

CLS 522. Hemostasis. – Normal hemostatic mechanisms and disorders of hemostasis; laboratory methods of evaluating and monitoring hemostatic functions. Prerequisites: MT 400Q or CLS 550 (or concurrent enrollment). 2 hours.

CLS 525. 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. Prerequisites: MT 400Q or CLS 550Q or concurrent enrollment and Permission of Instructor. 5 hours.

CLS 530. Immunogenetics, serological characteristics, and clinical significance of blood group systems; antibody identification; pretransfusion testing and problem-solving; donor blood collection; component preparation; transfusion and cellular therapy; investigation and treatment of immune hemolytic disorders. Prerequisites: MT 400Q or CLS 550Q or concurrent enrollment, CLS 525 and Permission of Instructor. 7 hours.

CLS 536. Clinical Microbiology I. -- Characteristics of medically important bacteria; procedures and techniques used for isolation and identification of bacteria from clinical specimens; susceptibility testing; quality assurance; data interpretation and clinical correlation; independent study of selected microbial agent. Prerequisites: MT 400Q or CLS 550Q or concurrent enrollment. 7 hours.

CLS 540. 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. Prerequisites: CH 117, MT 400Q or CLS 550Q or concurrent enrollment and Permission of Instructor. 4 hours.

CLS 541. 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. Prerequisites: MT 400Q or CLS 550Q, MT 340 or CLS 540 and Permission of Instructor. 4 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 analysis. Applications in microbiology, prenatal diagnosis, cancer management, transplantation, paternity testing, thrombosis risk testing and forensic medicine. Lecture, web-enhanced recitation, lab, graduate project. Prerequisites: MT 400Q or CLS 550Q or concurrent enrollment, Permission of Instructor. 4 hours.

CLS 550Q. Health and Safety Management. –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; contact **greenup@uab.edu** for information. 1 hour online.

****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: MT 325 or CLS 525; MT 302 or CLS 502; MT 430 or CLS 530; MT 421 or CLS 675; MT 437 or CLS 642 or concurrent enrollment; MT 441 or CLS 541 or concurrent enrollment; MT 402 or CLS 522 or concurrent enrollment; or Permission of Instructor.

****CLS 606. Advanced Immunology Clinical Practice.** --Directed clinical practice in clinical immunology laboratory procedures and methods of evaluation and monitoring organ function, disease presence and progression, therapy; instrumentation, quality assurance practices; safety. Prerequisites: CLS 525 or concurrent enrollment and Permission of Instructor. 1 hour.

** **CLS 607. Advanced Chemistry Clinical Practice.** --Directed clinical practice in clinical chemistry laboratory procedures and methods of evaluating and monitoring organ function, disease presence and progression, therapy; instrumentation, quality assurance practices; safety. Prerequisites: CLS 675 or concurrent enrollment and Permission of Instructor.

****CLS 608. Advanced Hematology Clinical Practice.** --Directed clinical practice in hematology, hemostasis, and body fluids laboratory procedures and methods, problem-solving, quality assurance, preventive maintenance, and safety. Prerequisites: CLS 502, CLS 522, CLS 541 or concurrent enrollment and Permission of Instructor.

****CLS 609. Advanced Immunohematology Clinical Practice.** -- Directed clinical practice in immunohematology and transfusion medicine laboratory procedures and methods; pretransfusion testing and problem-solving; quality systems; blood utilization review; transfusion practices; safety. Prerequisites: MT 430 or CLS 530 or concurrent enrollment and Permission of Instructor. 2 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 and Permission of Instructor.

****CLS 612. Advanced Microbiology Clinical Practice.** --Directed clinical practice in clinical microbiology laboratory procedures and methods of evaluating and monitoring organ function, disease presence and progression, therapy; instrumentation, quality assurance practices; safety. Prerequisites: MT 437 or CLS 642 or concurrent enrollment and Permission of Instructor.

CLS 637. Emerging Diagnostic Technologies.--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 642. Infectious Disease Principles.--Microbial virulence factors, host defense mechanisms, and methods of transmission; major clinical syndromes and infectious diseases and their etiologic agents with focus on fungal, parasitic, viral , and unusual microbial agents; microbial detection and/or isolation, identification of isolates and antimicrobic studies. Prerequisite: MT 336 or CLS 536 and Permission of Instructor.

CLS 675. Advanced Clinical Chemistry.--Method evaluation; nutrition and wellness assessment, endocrinology evaluation, reproductive and pregnancy monitoring; pharmacokinetics, therapeutic drug monitoring and drugs of abuse; lipids; heme synthesis and evaluation; organ system evaluation and application of total testing process to error reduction; preparation for accreditation; nanotechnology, reference intervals and biological variation. Prerequisite: CLS 520 and Permission of Instructor.

*/**CLS 684. Clinical Practicum.**--Directed clinical practice in advanced specialty laboratory procedures and methods; quality control systems, preventive maintenance, problem solving, safety. Prerequisite: Permission of Instructor. 1-6 hours.

*__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: Biostatistics and Permission of Instructor.

*/**__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.

Health Administration (M.S.H.A.)

Residential and Executive M.S.H.A.

Director:	Dr. Stephen O'Connor
Phone:	(205) 934-1735
E-mail:	**sjo@uab.edu**
Web site:	**www.uab.edu/hsa**

Primary Faculty

Eta Berner, Professor (Health Services Administration); Health Informatics

Jeffrey Burkhardt, Associate 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 (Health Services Administration); Health Services Administration, International Health, Public Policy

Stephen J. O'Connor, Professor (Health Services Administration); Governing Boards, Medical Staff Relations, Organization Behavior, Human Resources Management

Helmuth Orthner, Professor (Health Services Administration); Health Informatics

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

Norman W. Weissman, Professor (Health Services Administration); Technology Assessment, Health Services Research

Secondary Faculty

Bowers, Donkersloot, Duncan, Fos, Ginter, Hoidal, , Kennedy, Morrisey, Patterson, Phillips, Powers, Ransburg-Brown, Smith, Van Matre, Waldrum, 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 1,100 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 30 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 to the Admissions Coordinator, Residential Master of Science in Health Administration Program, UAB School of Health Professions, Webb 506, 1530 3rd Avenue South, Birmingham, Alabama 35294-3361.

Telephone 205-934-1583

E-mail **kendall@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 Residential Program June 1 for Executive Program
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE or GMAT (Standardized test scores are not required of applicants holding a doctoral degree (e.g., M.D., D.D.S., J.D., Ph.D., etc.) from an accredited U.S. university. TOEFL and TWE also required for international applicants whose native language is not English.)
Comments	Additional application for admission is required by program
Graduate Catalog Description	**http://main.uab.edu/show.asp?durki=23967**

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 **kendall@aub.edu**

Web **www.uab.edu/msha**

or the UAB Graduate School of Management, 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 447, 1530 3rd Avenue South, Birmingham, Alabama 35294-3361.

Telephone 205-934-1672

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

Web **www.uab.edu/emsha**

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.

611. **Managed Care**. Examination of factors that will influence direction of managed care in future. Changing relationships among major stakeholders. Broad areas of discussion including market dynamics, product characteristics, reimbursement methodologies, contracting issues, management information systems, government initiatives, legal and ethical issues, and future trends.

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.

616. **Medical Aspects of Emergency and Disaster Management**. This course explores the health and medical issues that are inherent to crisis and emergency management, examines the roles and responsibilities of the medical delivery system of the U.S. relative to emergencies and all-hazards disasters, reviews related research, and discuss plans that adequately address the issues.

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**. Application of financial management techniques to decision making for health care providers. Financial management functions and organizations, financial statement analysis, working capital management, present value analysis, capital budgeting, cost of capital, variance analysis, financing techniques, and financial analysis case studies.

621. **Health Care Financial Management II**. Analytical and synthetic aspects of financial management tools. Project method and case studies used to supplement theory.

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.

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.

638. **Microcomputers in Health Services Administration**. Applications of one or more of the major microcomputer software programs. Focus on programs not covered in other courses which are important to health care managers. Optional as independent study course devoted to a particular program of interest. 1-3 hours.

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.

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.

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.

655. **Seminar: Synthesis of Health Services Administration**. Case method and problem-solving applications. Integration of materials presented during previous academic coursework.

661. **Seminar: Social Issues in Health Services Administration**. Social issues confronting and influencing health care delivery systems, maximum student participation in research and conduct of seminar, optional individual research project.

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.

Health Informatics (M.S.H.I.)

Degree Offered:	M.S.H.I.
Director:	Dr. Amanda Dorsey
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E-mail:	**mshi@uab.edu**
Web site:	**www.uab.edu/hi**

Core Faculty

Eta S. Berner, Ed.D. Professor (Health Services Administration)

Helmuth F. Orthner, Ph.D., Professor (Health Services Administration)

Other Participating Faculty

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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)

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S. Robert Hernandez, Ph.D., Professor (Health Services Administration)

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Shannon Houser, Ph.D., Assistant Professor (Health Services Administration)

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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)

Randal H. Robertson, Ph.D., Associate Professor (Health Services Administration)

Tommy J. Sanders, M.S.H.A, 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)

William A. Terrell, Credit Course Instructor (Health Services Administration)

Michael R. Waldrum, M.D., Associate Professor (Internal Medicine/Pulmonary & CCM)

Norman W. Weissman, Ph.D., Professor (Health Services Administration)

Adjunct Faculty

David M. Bowen, Adjunct Professor (Health Services Administration)

Randy Carpenter, Adjunct Professor (Health Services Administration)

Gerri Lynn Frantz, Adjunct Instructor (Health Services Administration)

R. David Friday, Adjunct Instructor (Health Services Administration)

Glenn G. Hammack, Adjunct Professor (Health Services Administration)

Jacqueline W. Kennedy, Adjunct Professor (Health Services Administration)

Michael E. McDevitt, Adjunct Professor (Health Services Administration)

Judy G. Ozbolt, Adjunct Professor (Health Services Administration)

Susan Z. Pretnar, Adjunct Instructor (Health Services Administration)

Harold H. Scott, Adjunct Professor (Health Services Administration)

Tim Stettheimer, Adjunct Professor (Health Services Administration)

Program Information

Program Admission

The optimum size of the Health Informatics (HI) program is conditioned by several resource constraints, particularly faculty availability, physical space, and staff support. The maximum size of each entering class should be approximately 20 to 25 students. However, because most students in the HI program are part-time, it is anticipated that the program enrollment may be larger.

Admission to the program is usually in the fall semester. Application to the program may be made in 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.

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. If you are still in school, a transcript showing the first three years of undergraduate work is acceptable; you need not delay your application until the first semester (or quarter) that grades of your final year are available. Before matriculation, entering students must have received a final transcript for each degree received.

All applicants, except those holding a professional doctoral degree (e.g., M.D., J.D., D.D.S.) from a U.S. accredited school, must submit scores for a standardized admission test. Scores for the general test of the Miller Analogies Test (MAT), the Graduate Record Examination (GRE), or the Graduate Management Admission Test (GMAT) are acceptable. A score of 50 on the MAT, a combined score of at least 1000 on the two sections (verbal and quantitative) of the GRE or a score of at least 480 on the GMAT is required for unconditional admission.

The applicant should include a carefully drafted statement about his or her personal interests, career goals, and relevant background experience.

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.

Program applicants should have completed three hours of undergraduate course work in event-driven programming (e.g., Visual Basic, C++, Java) prior to the fall of the student's first year, if planning to enroll full-time, or prior to their second year, if planning to enroll part-time.

The Health Informatics Program offers a visual basic course, HI 585, in the summer semester that fulfills this prerequisite.

Admission to the HI program is determined by a 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	GRE, GMAT, or MAT (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=24900**

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 twelve (12) Core Courses, an Administrative Internship (or a Thesis Project or a Non-thesis Project) and 9 credit hours of elective credit for a total program of 60 semester credit hours. Elective courses are identified by (E) at the end of the course title in the following course list.

Health Informatics (HI)

585. **Making the Computer Work for You: An Introduction to VBA and Visual Basic**. Applications in Visual Basic for Applications (VBA) and Visual Basic development; concepts of rapid prototyping for building dynamic applications. Microsoft Office tools will be used and integrated with Front Page for Web-enabled environments. Satisfies Computer Prerequisite for HI Program Admission. 3 hours.

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: HI 585 or two undergraduate computer courses including visual programming. 4 hours.

601. **Databases and Data Modeling**. Concepts of data modeling, data architectures, and data administration. Study of various models with application to current health information projects. One hour required weekly in Health Informatics Computer Lab applying database skills. Prerequisite: HI 600 or permission of instructor. 4 hours.

602. **Clinical and Administrative Systems**. Foundations of clinical information use starting with information collection, processing (e.g., decision making) and recording. All aspects of clinical information use in inpatient and outpatient facilities. Special emphasis on the clinician's work to support enterprise-wide health care delivery. Prerequisites: HI 605, and 640 or permission of instructor. 4 hours.

605. **Communications and Networks**. Architecture of enterprise-wide voice, data, and video communication systems of healthcare organizations and its implications for information systems. Fundamental concepts of local and wide-area networks using various transmission media including copper, glass (optical), and wireless technologies. Transmission and switching components; network security and fault-tolerance; emerging high-speed data access to the Internet. One hour required weekly in Health Informatics Computer Lab applying communication/networking skills. Prerequisites: HI student or permission of instructor. 4 hours.

610. **Health Care Information Resources Management**. Concepts and techniques in health care enterprises for information resources management through case study. Resource allocation, techniques for prioritization and control, project management, system installation, and operational fundamentals for information services. Prerequisites: HI 640 or permission of instructor. 4 hours.

612. **Organizational Behavior and Leadership**. Systematic examination of human behavior in organizational settings with special application to health care organizations. Emphasis on study of individuals and small groups; personality, perception, attitudes, motivation, communication, and leadership. Case discussions and textbook readings. Prerequisite: Permission of instructor. 3 hours.

615. **Administrative and Clinical 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.

616. **Knowledge Discovery and Data Mining (E)**. Concepts and strategies for the design, development, and implementation of data warehouses and repositories to enable their exploitation by knowledge discovery and data mining technologies. Various models of data warehouse and repository design, and of the various methodologies associated with data mining and machine learning. Applications are made to the healthcare organization. Prerequisites: HI 615 and advanced statistics, or computer science course work, 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. Prerequisites: HI 602, 605, and 640, or permission of instructor. 3 hours.

622. **Financial Management for Health Professionals**. Financial statements, cost allocation, capital budgeting, time value analysis, reimbursement, financial risk and return, long-term debt financing, capital structure, cost of capital, and analysis of financial performance. Prerequisite: Graduate level health profession student 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 realize these benefits. 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.

632. **Quantitative Methods**. Selected mathematical, statistical, and computer applications and statistical techniques applied to decision making in hospitals and health care organizations. Prerequisite: HI student or permission of instructor. 3 hours.

640 & 640Q (online version of 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.

644Q. **Health Informatics Ethical and Legal Issues**. **(E)** Overview of major ethical issues in health informatics. Preparation of future informatics leaders in developing a course of action relative to these ethical and legal issues. Forum for discussion of various viewpoints is provided. Electronic form. Prerequisite: permission of instructor. 3 hours

645. **Project Management**. **(E)** IT project management in a healthcare setting. Formal project management techniques, specific case studies, as well as, organizational dynamics. The course will cover the requirements necessary for formal certification. 3 hours

655. **Synthesis of Health Informatics. (E)** Topics in Health Informatics not covered in other courses. Introductory tutorials and state-of-the-art overviews. How to lead and facilitate discussions of complex health informatics issues and integrate material with remainder of HI program. Prerequisites: HI 600, 601, 602, 605, 620, and 640; or permission of instructor. 3 hours.

692. **History of Health Informatics (E)**. Systematic and chronological overview of significant events associated with the development of medical and health informatics and a chronological picture of why and how information technology has been applied to meet problems in medicine and health care delivery. Prerequisite: HI 640. 3 hours.

694. **Special Topics in Health Informatics (E)**. Study of selected topics in health informatics. May be repeated for credit. 3 hours. Prerequisite: Permission of instructor. 3 hours.

695. **Independent Study in Health Informatics (E)**. Opportunity to investigate, perform activities and/or conduct a project related to a narrow topic in Health Informatics that corresponds with the current research of HI faculty, including medical informatics, nursing

informatics, computer and communication sciences, library science, etc. May be repeated for credit. Prerequisite: Permission of instructor. 1-4 hours.

696. **Seminar Health Informatics**. (E) Knowledge of key issues in informatics, health care and business is important to the professional development of the health informaticist. Gaining access to the wide variety of resources required to stay abreast of each of these areas is difficult without guidance. This seminar course is offered as a weekly noon discussion group and will cover important topics of interest to health informatics professionals. Each session will consist of a brief presentation followed by a discussion period. 1 credit hour.

Thesis, Project, or Administrative Internship: Each student must complete an administrative internship, thesis, or non-thesis research project. Each student, in consultation with Program Faculty, chooses the most appropriate option. Prior to enrolling for the thesis or project, it is recommended that you prepare for it by first enrolling in an independent study to do preparatory research. It is also recommended that you enroll for the thesis or project twice, i.e., 4 credits in one semester, and 4 credits in the following semester to give you ample time to complete your work. **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 information resource management theory and strategies. 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**. 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.

699. **Master's Level Thesis Research**. Original research in health informatics and interpretation of results. Demonstrates student's acquaintance with literature of field and competency in proper selection and execution of research methodology. Recommended for students planning to pursue a doctoral degree. May be repeated for credit (8 hours maximum credit allowed). Prerequisite: Permission of instructor. 4-8 hours.

Elective Courses

The latter should be selected by the student from the following list of recommended elective courses. Other courses require approval of the program director.

HI 616. **Data Mining**. 3 hours.

HI 644Q. **Health Informatics: Ethical & Legal Issues**. 3 hours.

HI 645 **Project Management**. 3 hours.

HI 655. **Synthesis of Health Informatics**. 3 hours.

HI 692. **History of Medical and Health Informatics**. 3 hours.

HI 694. **Special Topics in Health Informatics**. 3 hours.

HI 695. **Independent Study in Health Informatics**. 4 hours.

HI 696. **Seminar Health Informatics**. 1 hour

Financial Management: The HI curriculum requires a minimum of one course in financial management (HI 622). Students who plan a career in the fiscal management of health care organizations, or the health care insurance may choose additional courses.

HA 620. **Health Care Financial Management I (E)**. Application of financial management techniques to decision making for health care providers. Financial management functions and organizations, financial statement analysis, working capital management, present value analysis, capital budgeting, cost of capital, variance analysis, financing techniques, and financial analysis case studies. 3 hours.

HA 621. **Health Care Financial Management II (E)**. Analytical and synthetic aspects of financial management tools. Project method and case studies use to supplement theory. Prerequisite: HA 620. 3 hours.

Research Methods and Statistics Alternatives:

Courses in quantitative and qualitative methods and scientific inquiry may be taken from courses offered in Health Services Administration, Biostatistics, or Public Health, with the approval of the HI Program Director.

BST 619. **Data Collection and Management (E)**. Basic concepts of study design, forms design, quality control, data entry, data management and data analysis. Hands-on experience with data entry systems and data analysis software. 3 hours. Prerequisites: BST 601-602 or consent of instructor. (Fall offering-School of Public Health)

EPR 607 & 608. **Microcomputer Applications to Statistical Analysis**-1 credit (607) Use of microcomputers in computations of descriptive statistics and **Statistical methods in Research and Education**-3 credits (608). 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. EPR 607 and 608 must be taken concurrently. (Fall and Spring offering-School of Education)

Organizational Behavior alternatives:

The following options are available for organizational theory/behavior credit and statistics credit respectively:

HCOW 609. Organizational Concepts Applied to Health Programs. (Public Health-Fall) 3 hours.

MPA 661. Administrative Theory and Behavior. (Social and Behavioral Sciences-Fall) 3 hours.
MBA 632. Organizational Behavior (Business-Fall & Spring) 3 hours.

Nurse Anesthesia (M.N.A)

Degree Offered:	M.N.A.
Director:	Dr. Charles P. Kendrick (Interim Director)
Phone:	(205) 934-7635
E-mail:	**shrp-naaa@uab.edu**
Web site:	**www.uab.edu/shrp**

Faculty

Chad A. Epps, Assistant Professor (Medicine) Critical Care

Michael Humber, Assistant Professor (Nurse Anesthesia) General Anesthesia

Charles Phillip Kendrick, Assistant Professor (Nurse Anesthesia) General Anesthesia

Ingrid D. Oakley, Assistant Professor (Nurse Anesthesia) General Anesthesia

E. Laura Wright , Assistant Professor (Nurse Anesthesia), General 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 ten years of full accreditation by the Council on Accreditation of Nurse Anesthesia Educational Programs.

Admission Requirements

Admission to the Master of Nurse Anesthesia (M.N.A.) program will be based on the assessment of the candidate's academic ability, work experience, and aptitude for a career in nurse anesthesia. In addition to meeting the admission requirements of the Graduate School, applicants must be graduates of an accredited nursing program and have earned a baccalaureate degree in nursing or in an appropriate science concentration; have a current professional R.N. license within the United States and be eligible for licensure within the State of Alabama; have a minimum of one year experience as an R.N. in a critical care area; have official exam results with minimum acceptable score of at least 900 combined on the verbal and quantitative sections of the GRE test or a score of 395 on the MAT exam; submit satisfactory letters of reference to include an immediate nursing supervisor; and complete a personal interview with the program admission committee. The deadline to apply for admission is October 1st.

Curriculum

The Master of Nurse Anesthesia Program begins in the fall semester of each year. It comprises 63 semester hours of didactic instruction and 46 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 nine months of enrollment. The curriculum does not permit enrollment on a part-time basis.

Additional Information

Deadline for Entry Term(s):	Fall
Deadline for All Application Materials to be in the Nurse Anesthesia Office:	October 1
Number of Evaluation Forms Required:	Two
Entrance Tests	GRE or MAT (TOEFL and TWE also required for international applicants whose native language is not English.)
Comments	Additional application for admission is required by the program. October 1 deadline. Application materials will be forwarded to the Graduate School by the Nurse Anesthesia Program upon applicant's acceptance.
Graduate Catalog Description	**http://main.uab.edu/show.asp?durki=24916**

For detailed information, contact Dr. Charles P. Kendrick, Interim Program Director, Master of Nurse Anesthesia Program, UAB School of Health Professions, SHPB 230, 1530 3rd Avenue South, Birmingham, AL 35294-1212.

Telephone 205-934-7635

E-mail **shrp-naaa@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.

Nurse Anesthesia (NA)

NA 600Q 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 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 hours.

NA 610. Medical Physiology . This course will introduce the student to the fundamental and advanced concepts of medical physiology. Topics will include all major physiology systems with emphasis placed on those that are more pertinent to the practice of anesthesia.
5 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.
3 hours

NA 620Q Anesthesia Pharmacology I . Online version of the standard NA 620 is for the post professional component of the nurse anesthesia program. This course will provide student with knowledge of various non-anesthetic pharmacological agents and their anesthetic implications.
3 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 hours

NA 621Q Anesthesia Pharmacology II. Online version of the standard NA 621. This course is for the post professional component of the nurse anesthesia program. The students will be provided with a basic pharmacologic foundation of medications used during an anesthetic.
3 hours

NA 630. **Biochemistry for Anesthetists.** Chemistry and metabolism of biologically important compounds and common pathways of metabolism. Regulation and chemical structure of electrolytes, pH balance, and biochemical nutrition.
3 hours

NA 640. **Principles I.** Principles and theories of anesthesia practice. Topics will include mechanisms of anesthesia equipment, methods of patient monitoring and fundamental concepts of related to the practice of anesthesia .
2 hours

NA 641. Principles II. The study of basic principles and monitoring techniques as they relate to the delivery of anesthesia. Topics includes a review of airway and various patient monitoring techniques the nurse anesthesia student will need in order to provide anesthesia.
3 hours

NA 645. **Professional Aspects**. Psychosocial, ethical, and legal aspects, department organization and management and history of anesthesia.
2 hours

NA 645Q Professional Aspects. Online version of the standard NA 645. This course is for the post professional component of the nurse anesthesia program. This course will include psychosocial, ethical, legal aspects, department organization and management and history of anesthesia.
2 hours

NA 646. Legal Issues & Practice Management. Malpractice and quality assurance concerns in the practice of anesthesia. Emphasis on how to avoid malpractice suits through appropriate departmental quality assurance programs.
1 hour

NA 646Q. Legal Issues & Practice Management. Online version of the standard NA 646. This course is for the post professional component of the nurse anesthesia program. This course covers malpractice and quality assurance concerns in the practice of anesthesia. Emphasis on how to avoid malpractice suites thorough appropriate departmental quality assurance programs.
1 hour

NA 650. **Regional Anesthesia**. Commonly used regional techniques including spinals, epidurals, supper extremity blocks to include brachial plexus and bier blocks, ankle blocks and retrobulbar blocks in relation to technique, positioning and pharmacology of local anesthetics
2 hours

NA 660. **Obstetrical Anesthesia**. Basic concepts concerning physiological changes that accompany pregnancy and their implication on anesthesia management of pregnant patients
1 hour

NA 660Q. Obstetrical Anesthesia. Online version of NA 660 for post professional component of the nurse anesthesia program. This course consist review of basic concepts and changes concerning anesthesia management of pregnant patients.
1 hour

NA 661. Anesthesia for Extremes of Age. Principles of anesthetic management in the pediatric and geriatric patient.
3 hours

NA 661Q. Anesthesia for Extremes of Age. Online version of NA 661 for post professional component of the nurse anesthesia program which covers principles of pediatric and geriatric patient anesthetic management.
3 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 hours

NA 670Q. **Anesthesia Pathophysiology I.** Online version of NA 670. This course is for the post professional component of the nurse anesthesia program. Detailed review of disease and major systems with emphasis on pulmonary and cardiovascular systems.
3 hours

NA 671. **Anesthesia Pathophysiology II.** Continuation of NA 670 Major system emphasis on renal endocrine, neurological, musculoskeletal, and gastrointestinal systems.
3 hours

NA 671Q. **Anesthesia Pathophysiology II**. Online version of NA 671 for post professional component. Detailed review of major system with emphasis on renal endocrine, neurological, musculoskeletal, and gastrointestinal systems.
3 hours

NA 672, 673, 674, 675 and 676 Clinical Practicum I ,II, III, IV & V - Operating room experience providing for application of theoretical principles of anesthesia management. Clinical course sequence provides anesthesia care for more complex surgical procedures 672 & 675 (8 hours each) 673,674,676 (10 hours each).
NA 678. **Advanced Electrocardiography**. Supplements content from pathophysiology and advanced practice courses relative to cardiovascular electrophysiology and its implication in perioperative period.
2 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 hours

NA 680Q. Anesthesia and Surgical Specialties Online version of NA 680 for post professional component . Detailed review of major surgical specialties and advanced anesthetic management technique for specialize surgical procedures.
3 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 hours

NA 698Q Graduate Project. Online version of the standard NA 698. This course is for the post professional component of the nurse anesthesia program. The course will provide 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 hours

NA 695 - 697 Special Topics. Review of specialty concepts as presented in NA 670,671, and 680 3 hours each

Nutrition Sciences (Ph.D., M.S.)

Degree Offered:	Ph.D.
Director:	Dr. Jose Fernandez
Phone:	(205) 934-2029
E-mail:	**jose@uab.edu**
Web site:	**www.uab.edu/nutrition**

Faculty

For additional courses in epidemiology and other public health areas, see the catalog of the School of Public Health.

David B. Allison, Professor (Biostatistics); Obesity (causes; effects on longevity; treatment), caloric Restriction & Longevity, Statistical Genetics

Jamy Ard, Assistant Professor (Nutrition Sciences); Culturally appropriate Dietary Interventions, Hypertension

Joseph E. Baggott, Assistant Professor (Nutrition Sciences); Folate and Antifolate Metabolism, One-Carbon Metabolism, Purine Biosynthesis

Marcas M. Bamman, Associate Professor (Physiology and Biophysics); Skeletal Muscle Hypertrophy, Resistance Training, Aging

C. Michael Brooks, Professor (School of Health Related Professions); Nutrition Education; Cancer Education, Prevention and Control; Asthma/COPD Self-Management

M. Amanda Brown, Assistant Professor (Nutrition Sciences); Dietetics Education.

Pi-Ling Chang, Associate Professor (Nutrition Sciences); Vitamin D and Cancer, Osteoporosis, Bone-Matrix Proteins, Osteoblast Differentiation

Maria De Luca, Assistant Professor (Nutrition Sciences); Genetics of fat storage and innate immune function, Obesity, Aging.

Isao Eto, Associate Professor (Nutrition Sciences); Nutritional Biochemistry, Folate Metabolism and Interactions, Cancer Biology and Biochemistry

Jose R. Fernandez, Assistant Professor (Nutrition Sciences); Gene Mapping, Genetic Admixture, Racial Differences, Obesity, Diabetes

Frank A. Franklin, Professor (Pediatrics); Gastroenterology, Lipids, Nutrition

Yuchang Fu, Assistant Professor (Nutrition Sciences); Gene Expression and Regulation Related to Lipid Metabolism in Atheroslcerosis and Diabetes

W. Timothy Garvey, Professor and Chair (Nutrition Sciences); Molecular, Metabolic, and Genetic Pathogenesis of Insulin Resistance, Type 2 Diabetes, and Obesity

Barbara A. Gower, Associate Professor (Nutrition Sciences); Endocrinology, Body Composition, Postmenopausal Hormone Replacement Therapy, Insulin Sensitivity

Douglas C. Heimburger, Professor (Nutrition Sciences); Clinical Nutrition Support and Assessment, Nutrition and Cancer

Gary Hunter, Professor (Human Studies); Exercise Physiology

Mohammed A. Khaled, Professor (Nutrition Sciences); Body Composition, Energy Metabolism, Oxidants and Antioxidants, International Public Health

Robert Kesterson, Assistant Professor (Genetics); CNS Regulation of Feeding

Carlos L. Krumdieck, Professor Emeritus (Nutrition Sciences); Folic Acid Metabolism, Carcinogenesis, Homocysteine Metabolism

Sarah L. Morgan, Professor (Nutrition Sciences and Medicine); Nutrition and Rheumatic Diseases, Folate and Antifolates, Osteoporosis

Tim R. Nagy, Professor (Nutrition Sciences); Regulation of Energy Expenditure; Body Fat/Caloric Restriction/Cancer; Small Animal Phenotyping

Chandrika Piyathilake, Associate Professor (Nutrition Sciences); Lung Cancer and Biomarkers

Charles W. Prince, Professor (Nutrition Sciences); Bone Metabolism, Vitamin D Function; Osteopontin, Orthopedic Implant Biocompatibility, Cellular Transduction of Mechanical Load

Bonnie A. Spear, Associate Professor (Pediatrics); Pediatric and Adolescent Nutrition

Marie-Pierre St-Onge, Assistant Professor (Nutrition Sciences); Obesity, Body Composition, Appetite, Functional Foods, Metabolic Syndrome.

Tsunenobu Tamura, Professor (Nutrition Sciences); Folate Metabolism, Trace Element Nutrition, Metabolic Inborn Errors

Philip A. Wood, Professor (Genetics); Fatty-acid Metabolism

Nancy H. Wooldridge, Assistant Professor (Pediatrics); Pediatric Nutrition, Nutrition Management of Patients with Pediatric Disease

M.S. Program in Clinical Nutrition

The program leading to the Master of Science degree with a major in clinical nutrition is designed to provide training and experience related to 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, general clinical research, exercise science, health education, health services administration, and public health.

Admission

The Clinical Nutrition 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 500 on each section of the GRE General Test.

Additionally, eligible students must be registered dietitians, registration-eligible dietitians, or have a baccalaureate degree from an American Dietetic Association-approved Didactic Program in Dietetics. A nutrition laboratory sciences option is offered to nondietetics students with strong chemistry backgrounds.

Degree Requirements

The graduate program in clinical nutrition offers the Plan I (thesis) option only. Candidates for the M.S. degree 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.

Curriculum Core Requirements

Successful completion of the M.S. degree will require completion of a minimum of 20 semester hours in Clinical Nutrition core courses, 6 semester hours of thesis research, and additional courses to be selected from departmental offerings.

Additional Information

Deadline for Entry Term(s):	Fall (preferred)
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 Dr. Amanda Brown, 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 212, 1675 University Boulevard, Birmingham, AL 35294-3360.

Telephone 205-934-3006

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

Web **www.uab.edu/nutrition**

Dietetic Internship

The Dietetic Internship Program is accredited by the Commission on Accreditation of Dietetics Education of the American Dietetic Association and is designed to prepare entry-level dietitians for careers in a variety of health care 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 Clinical Nutrition above) and are required to enroll in a full graduate course load each term during the internship.

A full-time (9-month) internship with a general emphasis is offered in Birmingham, and a part-time (11-month) internship is offered in each of the following cities in Alabama: Dothan, 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. Full-time interns will have 12 hours of graduate credit, and part-time interns will have 9 hours of graduate credit which may be applied toward the requirements for the M.S. in Clinical Nutrition. Students may elect to continue in the M.S. program in Clinical Nutrition to complete requirements for the M.S. degree on a full or part-time basis.

Additional Information

For detailed information, contact Dr. Amanda Brown, 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 212, 1675 University Boulevard, Birmingham, AL 35294-3360.

Telephone 205-934-3006

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 is rather traditional in structure and combines required and elective didactic

coursework in basic sciences and nutrition with 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 two papers that are publishable in peer-reviewed journals.

Additional Information

For detailed information, contact Dr.Tim R. Nagy, 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 419, 1675 University Boulevard, Birmingham, AL 35294-3360.

Telephone 205-975-9640

E-mail **tnagy@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)

589. **Internship Practicum**. Clinical experience in food service management and clinical nutrition. Fall, spring, summer.

601. **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. Fall.

604. **Principles and Practice of Nutrition Support**. Nutrition support for critically ill patients; theory integrated with clinical practice.

611. **Advanced Food Service Systems Management**. Management systems, application to hospital food service. Prerequisite: Permission of instructor.

618. **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 problems. Spring. 6 hours.

622. **Nutrition, Obesity, and Prevention of Cardiovascular Disease and Cancer**. 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.

633. **Laboratory Instruments and Methods in Nutrition Research**. Operation, capabilities, and limitations of laboratory instruments. Prerequisite: Permission of instructor. 1-3 hours.

636. **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.

650. **Body Composition and Energy Metabolism**. Methods of measurement and relationship to human health and disease. Prerequisite: Permission of instructor.

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.

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.

711. **Clinical Nutrition**. Nutritional aspects of growth, development, pregnancy, chronic diseases, nutrient requirements, sources, toxicities. Malnutrition in, and nutritional support of, hospitalized patients. Prerequisites: Biochemistry and permission of instructor. Spring. 4 hours.

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 problems. Spring. 6 hours.

722. **Nutrition, Obesity, and Prevention of Cardiovascular Disease and Cancer**. 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. Fall.

723. **Assessment of Nutritional Status in Populations**. Theoretical and hands-on instruction in methods of assessment of dietary intakes, body composition, and biochemical levels of macro- and micronutrients. Proper techniques for collecting measurements and review of computer software packages that specialize in analysis of specific measurements.

733. **Laboratory Instruments and Methods in Nutrition Research**. Operation, capabilities, and limitations of laboratory instruments. Prerequisite: Permission of instructor. Fall, spring, summer. 1-3 hours.

734. **Laboratory Methods in Vitaminology**. Vitamin determinations in clinical and other specimens. Prerequisite: Permission of instructor. Fall, spring, summer.

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.

750. **Body Composition and Energy Metabolism**. Methods of measurement and relationship to human health and disease. Prerequisite: Permission of instructor. Fall.

778. **Special Topics in Nutrition Sciences**. Fall, spring, summer. 1-5 hours.

788. **Advanced Nutrition Seminar**. Fall, spring, summer. 1 hour.

791. **Advanced Clinical Nutrition, Diagnosis, and Treatments**. Clinical rounds with nutrition support team; approximately 12 hours weekly. Limited enrollment. Prerequisite: NTR 711 or equivalent. 4 hours.

798. **Doctoral Nondissertation Research**. 1-12 hours.

799. **Doctoral Dissertation Research**. Prerequisite: Admission to candidacy. 1-12 hours.

Occupational Therapy (M.S.) *

Degree Offered:	M.S.
Director:	Dr. Penelope Moyers
Phone:	(205) 934-3568
E-mail:	**pmoyers@uab.edu**
Web site:	www.uab.edu/ot

Faculty

Elizabeth A. Barstow, Assistant Professor (Occupational Therapy); Low-Vision Rehabilitation, Neurodevelopmental Intervention, Functional Capacity Evaluations, Driver's Assessment

Jo Ann Clelland, Professor Emerita (Physical Therapy); Pain Management, Facilitation and Inhibition of Motor Activity

Stephanie C. DeLuca, Assistant Professor (Occupational Therapy)

Christopher Eidson, Assistant Professor (Occupational Therapy), Academic Coordinator of Fieldwork Education

Kathleen Foley, Assistant Professor (Occupational Therapy); Physical Dysfunction, Gerontology, Pathophysiology

Penelope A. Moyers, Professor and Chair (Occupational Therapy); Continuing Competence, Substance Use Disorders, Mental Health Practice, Upper Extremity Intervention, Biomechanics

Jan A. Rowe, Associate Professor (Occupational Therapy); Pediatrics, Community: Family Centered Practice and Assistive Technology

Laura K. Vogtle, Professor (Occupational Therapy); Pediatrics, Research Methods, Program Evaluation, Outcomes Research

Mary Warren, Assistant Professor (Occupational Therapy); Low-Vision Rehabilitation, Neurology, Physical Dysfunction

Program Information

MSOT Occupational Therapy

The Department of Occupational Therapy at the University of Alabama at Birmingham offers two master's degree programs and a graduate certificate in low vision. The professional program is an entry-level program in occupational therapy for individuals who hold a baccalaureate degree in a field other than occupational therapy. The postprofessional program provides advanced learning for the individual who already holds a degree in occupational therapy. In addition to the master's degrees, the department offers a graduate

certificate in low vision rehabilitation for those who are already an occupational therapist or for those who are in the MSOT entry-level program.

Professional Degree Program

The MSOT entry-level or professional program is a full-time day program. A portfolio or thesis is required for graduation.

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, PO Box 31220, Bethesda, MD 20824-1220; 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). 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

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

Applications can be accepted at anytime. Early submission of application for admission is recommended. Prerequisites and/or degrees do not have to be completed before the application process is initiated. Prerequisites and degrees must be completed before enrollment. Rolling admission begins September 1st and concludes July 15th before the

expected date of fall semester enrollment. Applications received after July 15th will be reviewed and admission will occur on a space-available basis. If space is not available, the application at the student's request will remain on file for consideration for the next year.

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: $35.00
    - International: $60
- Request one (1) official transcript to be mailed by the issuing institution to the UAB Graduate School:
- Submit official GRE test score
    - GRE Institutional code: 1856
- Submit official TOEFL test score (for international applicants only):
    - Institution code: 1856
- Mail Financial Affidavit of Support (for international applicants only)
- 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.

Received by UAB Department of Occupational Therapy

Department of Occupational Therapy (Entry Level)
1705 University Boulevard; RMSB 351
1530 3rd Avenue South
Birmingham, Alabama 35294-1212

- Complete and submit the Department of Occupational Therapy application
- Request one (1) official transcript to be mailed by the issuing institution to the Occupational Therapy-Entry Level program.

- See instructions (Graduate School requirements) regarding letters of recommendation

Contact the Department of Occupational Therapy or the OT website **(www.uab.edu/ot)** for an application packet, including the occupational therapy application. The OT application form and the recommendation letter forms can be downloaded from the OT website but cannot be submitted electronically.

International Students

Note the requirements outlined under Application Procedures. Additionally:

- UAB Graduate School international application form and the Department of Occupational Therapy application form.
- A transcript evaluation by an external agency prior to the submission of application materials. It is the student's responsibility to have the transcripts evaluated. Please contact the UAB Graduate School (205-934-8227) for information regarding agencies that will complete a transcript review.
- Students from countries where English is not the official and primary language must also take and receive an acceptable score on the TOEFL.

Requirements for Admission

Selection into the program will be based on the student's academic performance record and aptitude for a career as an occupational therapist. 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.
- have a minimum overall undergraduate GPA of 3.0 (A = 4.0)
- have a minimum undergraduate GPA of 3.0 (A = 4.0) in the prerequisite coursework;
- have a minimum GRE score of 1000 (500 in each verbal and quantitative) GRE scores must be within the last five years;
- participate in a personal interview with members of the faculty of the Department of Occupational Therapy . The interview is scheduled once the application is received; and
- complete steps outlined under Application Procedures.

Variations in these requirements are considered. In cases where applicants do not meet the principle requirements for admission, they may be admitted on probation with approval of the Dean of the Graduate School.

Procedures Following Acceptance

Once admitted, students will be allowed to enroll into the program in the desired entry year only if the following has been received by the dates designated in the Enrollment Information Packet.

Received by UAB Student Health

- completed UAB Medical History Questionnaire and physical examination, including proof of required immunizations with satisfactory screening by the UAB Medical Center Student Health Service
- proof of health insurance coverage,
- Received by the Department of Occupational Therapy
- updated transcripts indicating successful completion of prerequisites and proof of degree completion,
- signed Letter of Intent
- $300 nonrefundable tuition deposit to reserve a seat in the program (deposit will be applied to tuition)

Essential Requirements
Fundamental tasks, behaviors, and abilities necessary to successfully complete the academic and practice/fieldwork 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 Disability Support Services. For information: **http://students.uab.edu/services/show.asp?durki=40136**; or phone 205-934-4205.

Program Prerequisites - UAB Equivalents*

(Course requirements are listed in semester credit hours)
The applicant must have completed successfully (minimum grade of C, courses taken pass/fail are not accepted) prerequisite coursework in addition to, or in conjunction with the baccalaureate degree. The professional occupational therapy program is a progressive and challenging curriculum. These prerequisites are designed to prepare the applicant for success once admitted into the program. To that end, applicants should pursue the highest level of preparation possible.

Written & Verbal Communications to include any combination of (8-9 Hours)

English Composition - EH 101, 102	3
Literature – EH 216, 217 or 218	3
Public Speaking – CM 101	3
Medical Terminology * (required)	2-3

Natural Sciences and Mathematics (20 - 23 hours) to include

Human Anatomy * - BY 115	4
Human Physiology * - BY 116	4
Statistics - MA 180, PY 214, or SOC 110*	3-4
Physics * - PH 100 or 201+L (may have Math pre-requisite)	3-4
Computer Science * - CS 101+ L	3
Electives (e.g., Chemistry ** - CH 105 or 115+L, or Biology ** - BY 123+L)	3-4

Social and Behavioral Sciences (15 hours) to include

Abnormal Psychology * - PY 218	3
Developmental Psychology * - PY 212 (Human Development/Lifespan)	3
Electives ** (e.g., psychology, sociology, anthropology)	9

*Course must be completed within the last seven years; basic science coursework taken more than seven years ago must be repeated.
**Course must be completed within the last 10 years.

Typical Program
(Course requirements are listed in semester credit hours)

Fall Semester I	
OT 607 Analysis of Occupational Performance	(4)
OT 609 Barriers to Occupational Performance	(3)
OT 610 Mental Health Diagnoses Across the Lifespan	(3)
OT 620 Gross Anatomy + Lab	(4)
OT 675 History and Theory of Occupation	(3)
OT 698 Master's Level Non-Thesis Research	(1)
Spring Semester II	
OT 606 Occupation Based Practice Models	(4)
OT 623 Human Neuroscience I + Lab	(3)
OT 624 Occupations of Infants, Children, and Adolescents	(4)
OT 631 Biomechanics of Occupation	(4)
OT 667 Research Methods	(4)
OT 698 Master's Level Non-Thesis Research	(1)
Summer (12 week session) Semester III	
OT 605 Therapeutic Skills	(3)
OT 608 Human Neuroscience II	(3)
OT 632 Fieldwork Seminar I	(1)
OT 674 Technology Applications	(3)
OT 698 Master's Level Non-Thesis Research	(1)
Electives (2-3)	
Fall Semester IV	
OT 625 Occupations of Adults and Older Adults I	(5)
OT 633 Fieldwork Seminar II	(1)
OT 653 Using the Literature for Evidence Based Practice	(3)
OT 668 Mental Health Practice in Adulthood	(4)
OT 698 Master's Level Non-Thesis Research	(1)

Electives (2-3)	
Spring Semester V	
OT 634 Seminar in Professional Readiness	(1)
OT 662 Upper Extremity Function in Occupation + Lab	(3)
OT 664 Ethics of Management and Practice	(4)
OT 665 Occupations of Adults and Older Adults II	(5)
OT 688 Advanced Practice Topics	(4)
OT 698 Master's Level Non-Thesis Research	(2)
Electives (2-3)	
Summer Semester VI	
OT 685 Advanced Field Experience I	(10)
Fall Semester VII	
OT 686 Advanced Field Experience II	(10)

A total of six credit hours of electives AND six credit hours of Master's Level Non-Thesis Research must be completed to meet graduation requirements.

ELECTIVES are offered as scheduled:

OT 613 Sensory Integration Theory Applied in OT	(2)
OT 615 Infant/Toddler Mental Health: OT Intervention	(3)
OT 616 OT Role in Early Intervention and School System	(3)
OT 660 Seminar: Interdisciplinary Svcs/Developmental Disabilities	(2)
OT 677 Foundations in Low Vision Rehabilitation I	(4)
OT 679 Foundations in Low Vision Rehab II	(4)
OT 688 Advanced Practice Topic (Massage)	(2)
OT 689 Foundations in Treatment/Brain Injury	(3)

Additional Information

Deadline for entry term(s):	Fall semester
Deadline for all application materials to be in the graduate school office:	July 5 preceding the expected date of enrollment. Rolling admission begins September 1 and concludes July 15
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	**http://main.uab.edu/show.asp?durki=**95281

description	

Postprofessional Degree

Deadline for entry term(s):	Summer semester
Deadline for all application materials to be in the graduate school office:	April 5th of the spring term for summer 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
Graduate catalog description	**http://main.uab.edu/show.asp?durki=95281**

For further information contact:
Program Director
Master of Science in Occupational Therapy
School of Health Professions
RMSB 353
1530 3 rd Avenue South
University of Alabama at Birmingham
Birmingham, AL 35294-1212
Telephone 205-934-3568
E-mail **msot@uab.edu**
Web **www.uab.edu/OT**

Postprofessional Occupational Therapy Program

The program offers postprofessional education to occupational therapists who wish to learn advanced theoretical, practice, and research skills. Currently two online specialization options exist for the postprofessional – low vision and pediatrics. An on-campus gerontology specialization also exists. 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 in all three specialties guides the student through coursework for the areas indicated including theory, specialty practice application, research methodology, and a project or thesis. Elective coursework from related departments may be approved to satisfy degree requirements. 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

Minimum of four semesters (16 months) for the full-time student and approximately seven semesters for part-time students. Both the pediatric and low vision options were designed specifically for part-time students.

Program Entrance Date

Summer semester of the academic year.

Application Deadline

April 5th of the spring semester for summer enrollment.

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: $35.00
    - International: $60
- Request one (1) official transcript to be mailed by the issuing institution to the UAB Graduate School:
- Submit official GRE test score
    - GRE Institutional code: 1856
- Submit official TOEFL test score (for international applicants only):
    - Institution code: 1856
- Mail Financial Affidavit of Support (for international applicants only)
- 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.

Received by UAB Department of Occupational Therapy

Department of Occupational Therapy (Postprofessional program)
1705 University Boulevard; RMSB 351

1530 3rd Avenue South
Birmingham, Alabama 35294-1212

- Complete and submit the Department of Occupational Therapy application

- Request one (1) official transcript to be mailed by the issuing institution to the Occupational Therapy-Postprofessional program.

- See instructions (Graduate School requirements) regarding letters of recommendation

NOTE: Materials used in the low vision rehabilitation application process can be used for postprofessional master's application; however, three (3) letters of recommendation and GRE scores are also required.

International Students

Note the requirements outlined under Application Procedures

- UAB Graduate School international application and appropriate Department of Occupational application
- Non-refundable Graduate School application processing fee;
- A transcript evaluation by an external agency prior to the submission of application materials. It is the student's responsibility to have the transcripts evaluated. Please contact the UAB Graduate School (205-934-8227) for information regarding agencies that will complete a transcript review.
- Students from countries where English is not the official and primary language must also take and receive an acceptable score on the TOEFL.
- 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,
- a score of at least 500 on each section (verbal and quantitative) of the GRE general test,
- completed application for admission to the UAB Graduate School,
- three letters of reference,
- if accepted, 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.

Essential Requirements

Fundamental tasks, behaviors, and abilities necessary to successfully complete the academic and practice/fieldwork requirements of the program and to satisfy

licensure/certification, 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 Disability Support Services. For information: **http://students.uab.edu/services/show.asp?durki=40136**; or phone 205-934-4205).

Typical Program (Course requirements are listed in semester credit hours)

All students must specify a specialty area prior to entering the program. Course requirements for each of the three specialties are listed below.

Students interested in the postprofessional master's in low vision need to complete the 17 hours of coursework for the low vision certificate which can be viewed at (**http://main.uab.edu/shrp/default.aspx?pid=76987**). The following courses must be taken in addition:

OT 658	Foundations of Professional Education (4)
OT 667	Research Methods (3)
OT 653	Using the Literature for Evidence Based Practice (3)
OT 698	Non-Thesis Research (6) or
OT 699	Thesis Research (6)

Students interested in the postprofessional master's in pediatrics need to complete the following courses:

OT 658	Foundations of Professional Education (4)
OT 613	Sensory Integration Theory Applied in Occupational Therapy (2)
OT 615	Infant-toddler Mental Health Course (3)
OT 616	OT Role in Early Intervention and School Setting (3)
OT 641	Pediatric Theory Development and Practice (3)
OT 671	The Advanced Theory of the Assessment Process (3)
OT 667	Research Methods (3)
OT 653	Using the Literature for Evidence Based Practice (3)
OT 698	Non-Thesis Research (6) or
OT 699	Thesis Research (6)
OT 682	Advanced clinical Practicum (1-3)
OT 683	Practicum in Teaching (1-4)
OT 692	Directed Readings (1-3)
OT 681	Practicum in Consultation (1-2)
OT 655	Qualitative Research Methods for Health Professionals (2)

Students interested in completing the on-campus geriatric program will complete the 15 hour UAB Gerontology Certificate (see courses at **http://www.aging.uab.edu/**) plus the following coursework:

OT 692	Directed Readings (1-3)
OT 658	Foundations of Professional Education (4)
OT 667	Research Methods (3)
OT 653	Using the Literature for Evidence Based Practice (3)

OT 698	Non-Thesis Research (6) or
OT 699	Thesis Research (6)

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 courses 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.

For further information contact:

Laura K. Vogtle, PhD, OTR/L
Program Director
Occupational Therapy Postprofessional Program
UAB School of Health Professions
RMSB-338
1530 3rd Avenue South
Birmingham, AL 35294-1212
Telephone 205-934-3568
E-mail **lvogtle@uab.edu**

Low Vision Rehabilitation, Postbaccalaureate Certificate

The Graduate Certificate in Low Vision Rehabilitation prepares occupational therapists with bachelors, masters, or doctoral degrees and current professional-level occupational therapy students to work in one of the top 10 emerging practice areas identified by the American Occupational Therapy Association. Occupational therapists obtaining the certificate acquire the skills to provide comprehensive, competent intervention to persons with visual impairment from various conditions including brain injury.

Credentials Conferred

The Graduate Certificate in Low Vision Rehabilitation awarded by the University of Alabama at Birmingham.

Length of Study

Students who are already occupational therapists complete the graduate certificate in low vision rehabilitation in eight semesters. The certificate can be combined with the online post professional master's degree program enabling students to complete both degrees with just 16 additional credit hours of coursework.

Program Entrance Date

Spring Semester (begins in January)

Application Deadline

Beginning 2008

Applications can be accepted anytime. Early submission of application for admission is recommended. Rolling admission begins February1st and concludes September 1st before the expected date of Spring Semester enrollment. Applications received after September 1st will be reviewed and admission will occur on a space-available basis. If space is not available, the application at the student's request will remain on file for consideration for the next year.

Requirements for Admission

Students are selected based on a combination of factors including practice experience, desire, ability to successfully complete the coursework in the timeframe allotted, commitment to completion of the certificate and potential for employment in the low vision rehabilitation field.

To be considered for acceptance into the program, the student who is already an occupational therapist must satisfy the following requirements:

- A baccalaureate degree, master's or doctorate in occupational therapy from an educational program with ACOTE accreditation or WFOT recognition;
- Eligibility for licensure as an occupational therapists;
- Completed applications for admission to the UAB Graduate School and the Department of Occupational Therapy Low Vision;
- If accepted, provide proof of required immunizations to the UAB Medical Center Student Health Service.

Essential Requirements

Fundamental tasks, behaviors, and abilities necessary to successfully complete the academic and practice 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 Disability Support Services. For information: http://students.uab.edu/services/show.asp?durki=40136 (phone 205 934-4205).

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: $35.00
    - International: $60
- Request one (1) official transcript to be mailed by the issuing institution to the UAB Graduate School:

- Submit official TOEFL test score (for international applicants only):
    - Institution code: 1856
- Mail Financial Affidavit of Support (for international applicants only)
- Letters of recommendation are not required for the Low Vision Rehabilitation Certificate program.

Received by UAB Department of Occupational Therapy
Department of Occupational Therapy (Low Vision)
1705 University Boulevard; RMSB 351
1530 3rd Avenue South
Birmingham, Alabama 35294-1212

- Complete and submit the Department of OT Low Vision Rehabilitation application
- Request one (1) official transcript to be mailed by the issuing institution to the Department of OT-Low Vision Rehabilitation
- Documentation of state licensure or foreign equivalent

Current UAB Occupational Therapy professional program students should contact the Low Vision Rehabilitation Program Director in the Department of Occupational Therapy for application information.

Note the requirements outlined under Application Procedures.

- UAB Graduate School international application and Department of OT Low Vision application
- A transcript evaluation by an external agency prior to the submission of application materials. It is the student's responsibility to have the transcripts evaluated. Please contact the UAB Graduate School (205-934-8227) for information regarding agencies that will complete a transcript review.
- Students from countries where English is not the official and primary language must also take and receive an acceptable score on the TOEFL.

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. Direct access to a medical library is not required for the core courses and most electives; but the student must have consistent access to the internet. A high-speed connection (DSL, cable, satellite) is strongly recommended.

Two Tracks Are Available:

Students who are already an occupational therapist can enroll in the certificate program only or combine completion of the certificate program with a postprofessional master's degree in occupational therapy.

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. One course per semester is completed. Because one course builds on another, students must take the core courses in sequence. These courses provide the foundation needed for completion of the elective courses and must be completed before the elective courses can be taken. Following completion of the core courses, the student will select one of two electives offered during the next two semesters. Following completion of the core courses and the electives, the student will complete an advanced intervention application course. All courses must be satisfactorily completed before the intervention application course is scheduled. The final course requires that the student come to the UAB campus for one weekend seminar and performance skill checkout. 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 8 semesters.

Low Vision Rehabilitation/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 10 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 Sequence

NOTE: OT 677, 679 and 689 may be taken on campus without application to the graduate certificate with the permission of the instructor. Online courses can only be taken by students accepted into the graduate certificate program.

Spring Semester	3 credits
OT 677 Foundations in Low Vision Rehabilitation-I	
Summer Semester	
no classes, complete clinical observations	
Fall Semester	
OT 679 Foundations in Low Vision Rehabilitation-II	3 credits

Spring Semester	
OT 689 Foundations in Treatment of Visual Impairment from Brain Injury	3 credits
Summer Semester	
OT 690 Treatment Design and Application in Vision Rehab	2 credits
Fall Semester	
Electives **OT 694 Selected Topics in Low Vision Rehabilitation** or **OT 695 Foundations in Treatment Visual Impair from Brain Injury II**	2 credits
Spring Semester	
Electives **OT 693 Design & Implementation of LVR Prog in Healthcare System** or **OT 696 Evaluation & Treatment of Children with Visual Impairment**	2 credits
Summer or Fall	
OT697 Advanced Treatment Application	2 credits
Total Credits	17 credits

For further information contact:

Program Coordinator
Occupational Therapy Low Vision Rehabilitation Certificate Program
UAB School of Health Professions
RMSB 353
1530 3rd Avenue South
Birmingham, AL 35294-1212
Telephone 205-934-3568
E-mail **lvrcert@uab.edu**
Web **www.uab.edu/OT**

Course Descriptions

Occupational Therapy (OT)

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. 4 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. 4 hours. PREREQUISITE: Admission to OT Program.

608. **Human Neuroscience II** . Underlying neuroanatomical and neurophysiological principles as basis for evaluation and intervention of clients with neurological disorders; study of current research in selected areas of applied neurophysiology. 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 Diagnosis 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. **Gross Anatomy**. 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. **Human Neuroscience I.** 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. 5 hours. PREREQUISITE: Admission to OT Program.

631. **Biomechanics of Occupation** . 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. 1 hour. 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.

662. **Upper Extremity Function in Occupation**. Biomechanical principles in the service delivery of orthopedic conditions for the upper extremity are taught. Skills in evaluating orthopedic conditions are developed, involving assessments of musculoskeletal and sensory body functions and occupational performance. Intervention strategies including sensory re-education, edema reduction, range of motion, pain control, muscle strengthening, scar management, and splinting and orthotics are taught. Therapeutic occupations appropriate for remediating orthopedic conditions are analyzed. 3 hours. PREREQUISITE: Admission to OT Program.

664. **Ethics of Management and Practice** . Introduction to basic principles of organization and administration of occupational therapy programs related to practice in variety of settings. 4 hours. PREREQUISITE: Admission to OT Program.

665. **Occupations of Adults and Older Adults II**. 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 contexts and how these areas affect occupational performance. 4-5 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 psychiatric 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.

674. **Technology Applications**. Acquaints students with laws affecting the availability of assistive technology; assessments used in evaluation of clients for technology prescriptions, seating and wheelchairs, computer input devices, augmentative communication, and environmental controls systems. 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 have articulated occupation and used occupations in the therapeutic applications. 3 hours. PREREQUISITE: Admission to OT Program.

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. **Advanced Practice Topics**. Exploration of topics related to contemporary practice areas in occupational therapy. Specific focus varies according to the current and future trends in the practice environment. 2-4 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.

OTHER / ELECTIVE COURSES

611. **Occupation Centered Assessment**. A focus on assessment with activities and adaptation of tasks and environments to facilitate meeting needs of individuals and specific populations. 6 hours. PREREQUISITE: permission.

613. **Sensory Integration Theory Applied in OT**. Sensory processing is the ability to take in, organize and process a variety of sensory information on a daily basis. This class will illustrate how children with a variety of disorders, but in particular those with autism, have difficulties with the processing of sensory information. 2 hours (online). PREREQUISITE: permission.

614. **Role of Occupational Therapist in School Setting**. Explores legislation which mandates “a free and accessible public education”. Will discuss frequently used evaluations and intervention strategies in the school setting and the evidence which supports/refutes both. Coursework will be supplemented by “hands-on” experience in a variety of ways. 3 hours (online). PREREQUISITE: permission.

615. **Infant/Toddler Mental Health: OT Intervention**. Infant and toddler mental health is central to the work of an occupational therapist, both individually and with the treatment

team. The field of mental health for infants and toddlers has expanded greatly over the past ten years. OT clinicians are exposed to neglected, abused, and even abandoned babies/children but the depth of mental health problems is more extensive. This course will provide an overview and in-depth look at these problems and designated evaluation and intervention. 3 hours (online). PREREQUISITE: permission.

616. **OT's Role in Early Intervention & School Setting.** Babies, toddlers, and school age children with developmental disabilities may qualify for services (state and federal) which include occupational therapy. It is important to thoroughly understand state and federal legislation which applies to children with special needs for those wanting to practice in pediatrics. In addition, a thorough understanding of evaluations and interventions are needed. This course provides the student with knowledge and experience. 3 hours (online). PREREQUISITE: permission.

630. **Occupational Performance**. Critical review of approaches to evaluating occupational performance including conceptual models, frames of reference, practice applications, and development of assessment tools. Emphasis on documentation of practice outcomes. 3 hours. PREREQUISITE: permission.

636. **Principles of Applied Forces in Upper Extremity**. Anatomical and biomechanical concepts of normal and pathological movement in the arm or hand; principles of dynamic assist, remodeling analysis, and evaluation of upper extremity performance. 3 hours. PREREQUISITE: permission.

641. **Pediatric Theory Dev/Practice**. Students will explore various models which support pediatric practice. The models will include developmental, behavioral and occupational therapy domains. Through course text and readings from referred literature, students will engage in online discussions to better their understanding of theory development conceptual order, theoretical assumptions, and applicability to practice. 3 hours (online). PREREQUISITE. permission.

655. **Qualitative Research Methods for Health Professionals**. Explores the paradigm of qualitative research, including the role it has in the development of a deeper understanding of client populations and the development of theory in occupational therapy. Research design, data collection strategies, and methods of analysis will be discussed. 2 hours. PREREQUISITE: permission.

656. **Data Management for Clinical Research**. Strategies for collecting, storing, and analyzing data; methods for managing qualitative and quantitative data gathered and introduction to the use of SPSS and MS Word for analysis. 3 hours. PREREQUISITE: permission.

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.

660. **Seminar in Interdisciplinary Services for Infants, Children, and Youth with Development Disabilities** . Synthesis of team-based approaches to intervention for infants,

children, and youth with known or suspected disabilities. 1-2 hours. PREREQUISITE: permission.

671. **The Advanced Theory of the Assessment Process in OT**. Rationale for pediatric assessment, to include legislative mandates as found in school system and early intervention settings. Changes in concepts of disability and the OT Practice Framework will be reviewed and their impact on assessment discussed. The assessment process and goals of assessment will be reviewed. Assessment tools and decisions regarding assessment tools will be discussed, as well as the impact of practice models on these decisions. Individual and team assessment will be reviewed as they relate to practice setting. 3 hours (online). PREREQUISITE: permission.

676. **Health in the Context of Occupation.** Course based on problem based critical inquiry. Problem solving is explored in practice from the perspective of the client using action research methods. 3 hours. PREREQUISITE: permission.

677. **Foundations in Low Vision Rehabilitation I**. This course is the first of a two-course sequence. Topics covered include contribution of vision to occupational performance, demographics of the low vision population, service providers of low vision rehabilitation, reimbursement structure 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 and strategies for facilitating performance in reading and writing. 3-4 hours. PREREQUISITE: permission.

678. **Animal Therapy**. Fundamental knowledge of the role of animals (dogs & horses) in occupational therapy; the basic anatomy and diseases of these species; methods for minimizing exposure of patients to zoonotic diseases. Emphasis on animal assisted therapy and therapeutic riding/hippotherapy. Introduced to the key organizations which govern these areas of practice and their certification processes. 2 hours. PREREQUISITE: permission.

679. **Foundations in Low Vision Rehabilitation II**. Building on the information provided in Foundations in Low Vision Rehabilitation I, 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: completion of activities of daily living with and without vision, functional mobility, influence of the environment on visual performance, diabetes self-management and assistive technology and adjustment issues. 3-4 hours. PREREQUISITE: permission.

680. **Clinical Education and Supervision**. Departmental management and supervision of employees with secondary focus on occupational therapy fieldwork supervision. 3 hours. PREREQUISITE: permission.

681. **Practicum in Consultation**. Supervised consultation experience within area of specialized interest. 1-2 hours. PREREQUISITE: permission.

682. **Advanced Clinical Practicum**. Supervised clinical experience within area of specialized interest. 1-3 hours. PREREQUISITE: permission.

683. **Practicum in Teaching**. Supervised teaching experience. 1-4 hours. PREREQUISITE: permission.

689. **Foundations in Treatment of Visual Impairment from Brain Injury I**. This course addresses evaluation and treatment strategies for persons experiencing occupational limitations secondary to visual processing impairment from brain injury. Topics covered: neuroanatomy of the visual processing system, evaluation and treatment strategies for deficits in visual acuity, visual field integrity, oculomotor function, visual attention, visual cognitive processing. 3 hours. PREREQUISITE: permission.

690. **Treatment Design and Application in Vision Rehabilitation**. This course requires applications of the knowledge gained in the first three foundation courses to designing treatment plans for persons with various visual impairments. Students work through case studies, analyzing evaluation results, writing appropriate goals and designing appropriate treatment interventions. 2 hours (online). PREREQUISITES: permission.

692. **Directed Readings**. Readings for in depth study of specialized topics. 1-3 hours. PREREQUISITE: permission.

693. **Design and Implementation of Low Vision Rehabilitation Programs in the Health Care System**. In this course, students complete steps to implement a viable low vision rehabilitation program using the medical rehabilitation model. Topics covered: procedures and issues unique to low vision programs; identifying the treatment population and services; establishing a program structure; developing the rehab team, evaluation tools and treatment materials, space, billing, documentation, budgeting and marketing. 2 hours (online). PREREQUISITES: permission.

694. **Selected Topics in Low Vision Rehabilitation**. This course is designed to provide students with a greater depth of knowledge in specific aspects of low vision rehabilitation. Three instructors each teach a 4-week module in their area of expertise. Topics vary by semester but may include optics, diabetes self-management, psychosocial adjustments for client and family. 2 hours (online). PREREQUISITIES: permission.

695. **Foundations in Treatment of Visual Impairment From Brain Injury II**. Builds on information provided in OT 689 to explore evaluation and treatment strategies for persons experiencing visual processing impairment from brain injury. Topics covered include: deficiencies in focusing, visual vestibular dysfunction, and low functioning clients. Projects include multiple case studies, development of decision trees to guide evaluation and intervention, and critique of treatment interventions. 2 hours (online). PREREQUISITES: 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.

697. **Advanced Treatment Application in Low Vision Rehabilitation**. Required for completion of the graduate certificate, the course is designed around the AOTA Standards for Continuing Competence. Student demonstrates competence in five key areas of low vision practice: knowledge, performance skills, critical reasoning, ethical reasoning, and interpersonal abilities. Requires attendance at one weekend seminar at UAB. Half will take the course one semester and half in the next semester 2 hours (online). PREREQUISITE: permission.

699. **Master's Level Thesis Research**. Elements of proposal and development of thesis/project; thesis and institutional review board procedures; student presentation, group discussion, recommendations, and critique. 1-6 hours. PREREQUISITE: Admission to candidacy.

ELECTIVES are available as scheduled.

Physical Therapy (DPT; D.Sc.P.T.)

Degrees Offered:	D.P.T.; D.Sc.P.T.
Director (D.P.T.):	Dr. Sharon Shaw
Phone:	(205) 934-3566
E-mail:	**sshaw@uab.edu**
Web site:	**www.uab.edu/pt**
Director (D.Sc.P.T.):	Dr. Cecilia Graham
Phone:	(205) 934-5949
E-mail:	**cgraham@uab.edu**
Web site:	**www.uab.edu/pt**

Primary Faculty

Cara C. Adams , Associate Professor (Physical Therapy); Exercise and Postural Deviations

Joan Bergman , Professor Emerita (Physical Therapy); Developmental Disabilities

C. Scott Bickel , Assistant Professor (Physical Therapy); Skeletal Muscle Function, Electrotherapeutics

Jennifer Braswell , Assistant 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

Matthew Ford , Assistant Professor (Physical Therapy); Motor Control Dysfunction

Kennon T. Francis , Professor Emeritus (Physical Therapy); Exercise in Health Promotion; Delayed Muscle Soreness

Cecilia Graham , Associate Professor (Physical Therapy); Education, Acute Care

Robert S. Harden , Associate Professor Emeritus (Physical Therapy); Ethical and Legal Dimensions of Physical Therapy

Terry R Hoobler , Professor Emeritus (Physical Therapy); Applied Physiology and Isokinetics, Prosthetics, Thermal Modulities Exercise

Cheryl J. Knowles , Associate Professor (Physical Therapy); Cardiopulmonary Physical Therapy

John Lowman , Assistant Professor (Physical Therapy); Cardiopulmonary Physical Therapy

John McCarthy , Assistant Professor (Physical Therapy); Exercise Physiology

David M. Morris , Associate Professor (Physical Therapy); Aquatic Physical Therapy, Clinical Education

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

Dorothy Pinkston , Professor Emerita (Physical Therapy); History of Physical Therapy, Curriculum Development

Sharon E. Shaw , Associate Professor (Physical Therapy); Health Outcomes Assessment, Rehabilitation Management of Neurological Conditions

Carolyn Sherer , Assistant Professor (Physical Therapy); Orthopedic Rehabilitation, Cultural Diversity in Disability

Program Information

Two courses of study are available in the Department of Physical Therapy. The Doctor of Physical Therapy (DPT) is the professional program, which is designed for individuals without prior qualifications in physical therapy; and the postprofessional program, the Doctor of Science in Physical Therapy (DScPT) which is designed for those who already hold degrees in physical therapy.

Doctor of Physical Therapy

Physical therapists provide services to patient/clients who have impairments, functional limitations, disabilities, 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 professional. Finally physical therapists also function in consultative, educator, 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 : Diploma–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/licensing/index.asp**

Length of Study : Eight semesters.

Program Entrance Date : Spring semester.

Application Deadline : All material must be sent to the Admissions Office of the Department of Physical Therapy and received no later than January 15 preceding the expected term of enrollment.

Application Procedure : The following materials must be submitted directly to the Department of Physical Therapy:

- Department of Physical Therapy Application
- two official transcripts from each college attended,
- test scores (GRE), and GRE Writing Assessment scores, and
- three evaluation forms (references).

The following must be submitted online, directly to the Graduate School

UAB Graduate School Application

a non-refundable $35.00 application fee.

Requirements of 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:

- have a minimum GRE score of 1,100 (minimum 550 verbal and minimum 550 quantitative),
- GRE Writing Assessment , minimum score of 3.5
- have a minimum 3.0 (A=4.0) overall GPA and on the last 60 semester hours of course work,
- have a minimum academic average performance of 3.0 in the biological sciences, 3.0 in the physical sciences, 3.0 in 6 semester hours of English composition, and at least a C in each of the other prerequisite courses,
- complete a personal interview with the Department of Physical Therapy faculty, and
- if accepted, 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.
- document current certification of Basic Life Support for Health Care Providers,
- complete the required course in Medical Terminology as specified by the Department of Physical Therapy.
- A criminal background check specified by the Department of Physical Therapy

Because state law regulates the practice of Physical Therapy, 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
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 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)

**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.*

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 (3)
PT 702 Functional Anatomy (4)
PT 730 Essentials of Human Physiology (2)
PT 711 PT Examination I (2)
PT 713 PT Intervention I (3)
PT 760 PT Professional Practice I (2)
PT 790 Scientific Inquiry I (1)

Summer
PT 701 Human Gross Anatomy II (2)
PT 706 Neuroscience I (4)
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 791 Scientific Inquiry II (1)

Fall
PT 707 Neuroscience II (3)
PT 704 Analysis of Human Movement (4)
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 740 PT Management of Musculoskeletal Dysfunction I (5)
PT 743 PT Management of Cardiopulmonary Dysfunction (3)
PT 761 PT Professional Practice II (3)
PT 772 Clinical Education III (2)
PT 798/799 Scholarly Activity Project (1-3)

Fall
PT 741 PT Management of Musculoskeletal Dysfunction II (5)
PT 744 PT Management of Neuromuscular Dysfunction I (4)
PT 762 PT Professional Practice III (3)
PT798/799 Scholarly Activity Project (1-3)

Third Year
Spring
PT 746 PT Management of Neuromuscular Dysfunction II (4)
PT 763 PT Professional Practice IV (2)
PT 793 Scientific Inquiry IV (1)
PT 798/799 Scholarly Activity Project (1-3)
PT 773 Clinical Education IV (8)

Summer
PT 745 Complex Clinical Management Seminar (2)
PT 774 Clinical Education V (9)

Fall
PT 775 Clinical Education VI (9)

Total Credit Hours for Program: 119-121

Additional Information

For detailed information, contact Betsy Coleman, Physical Therapy Department, School of Health Professions, RMSB, Room 333, 1705 University Boulevard (mailing address: SHPB 333, 1530 3rd Ave S), Birmingham, Alabama 35294-1212.
Telephone 205-934-4363
E-mail **becol@uab.edu**

DScPT – Postprofessional Program

The post professional Doctor of Science in Physical Therapy (DScPT) program offers a 61 to 66-semester hour advanced curriculum for practicing physical therapists. The curriculum is composed of core courses and a choice of concentration in musculoskeletal, neuroscience or clinical outcomes research. The program may be completed on a part-time or full-time basis. This program provides the graduate with the advanced knowledge and skills to serve as a leader within health care and educational environments through examination and revision of current practice guidelines and through the development and implementation of new programs.

Accreditation : The University of Alabama is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award degrees at the bachelor's, master's, specialist, and doctor's levels.

Credentials Conferred : Diploma – The Doctor of Science in Physical Therapy degree is awarded by the University of Alabama at Birmingham.

Length of Study : 2 ½ to 3 years for full-time students

Program Entrance Date : Primarily in the fall semester; spring admission may be considered

Application Deadline : Rolling admissions

Application Procedure : The following materials must be submitted directly to the Department of Physical Therapy

- Two official transcripts from each college attended
- Official GRE scores
- Three recommendation forms
- Current resume
- Copy of current U.S. physical therapy license

The following must be submitted online, directly to the Graduate School

UAB Graduate School Application

A non-refundable $35.00 application fee

Requirements of Admission : The applicant must hold a Master's degree in Physical Therapy or a Bachelor's degree in Physical Therapy and a Master's degree in a related field. Minimum admissions requirements include:

- GRE scores: 550 verbal, 550 quantitative, and 4.5 analytical writing
- GPA: 3.00/4.00 in all previous work
- Complete a personal interview with Department of Physical Therapy faculty
- If accepted, provide proof of required immunizations and proof of current certification in BCLS for Healthcare Providers

*Typical DScPT Curriculum for a Full-Time Student**

Year 1 Fall
PTDS 702: Advanced Movement Science (3)
PTDS 710: Health Promotion in Physical Therapy (3)
PTDS 720: Introduction to PT Clinical Outcomes (3)

Year 1 Spring
PTDS 703: Issues in Movement Science (3)
PTDS 711: Health Promotion Planning and Administration (3)
PTDS 721: Foundations for PT Outcomes Research I (3)

Year 1 Summer
PTDS 704: Principles of Clinical Decision Making (3)
PTDS 712: Program Evaluation and Health Policy (3)
PTDS 722: Foundations for PT Outcomes Research II (3)

Year 2 Fall
PTDS 700: Essentials in Medical Screening I (3)
PTDS 705: Clinical Decision Making in Physical Therapy (3)
PTDS 713: Field Experience in Health Promotion (1)
PTDS 708: Professional Development Seminar I (1)**

Year 2 Spring
PTDS 701: Essentials in Medical Screening II (3)
PTDS 798: Dissertation Proposal (3)

Elective (3)**

Year 2 Summer
Comprehensive Exam***
PTDS 798/799: Proposal/dissertation (1–6)
PTDS 709: Professional Development Seminar II (1)

Year 3 Fall
PTDN/M/C 730: Advanced focus course I (3-4)
PTDS 799: Dissertation (1-6)

Year 3 Spring
PTDN/M/C 731: Advanced focus course II (3-4)
PTDS 740: Practicum (3-6)
PTDS 799: Dissertation (1-6) (continue as needed)

** Alternative degree plans are available for students wishing to enroll in fewer courses per semester*

***Elective courses may be taken any semester*

****The comprehensive exam is taken upon completion of the core coursework and research sequence*

Course Descriptions

Physical Therapy (PT)

700, 701. **Human Gross Anatomy I, II**. A study of the gross anatomical structure of the human body includes the 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. Includes lecture, dissection of the human body, and demonstrations. PT 700-3 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. 4 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. 4 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. **Introduction to 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 I**. This course covers procedures and techniques for the design and implementation of fundamental therapeutic exercise. By recognizing impairments and functional 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 electrodiagnositic 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. 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 the pulmonary, cardiovascular, and skeletal muscle systems, as well a thermoregulation of the body. Both cellular and systemic issues are addressed with an emphasis on a mechanistic and integrative approach to understanding function. 2 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, 746. **PT Management of Neuromuscular Dysfunction I, II**. Application, analysis, and synthesis of principles of neurophysiologic rehabilitation in physical therapy examination, evaluation, diagnosis, and intervention. PT 744 – 4 hours, PT 746 – 4 hours

745. **Complex Clinical Management Seminar**. Integration of all previous course work applied to complex cases reflective of the scope of PT practice: direct patient/client physical therapy care; case management, clinical pathways, consultation, reimbursement issues, critical inquire, administration and management. Develop and presents portfolio reflecting personal & professional growth and accomplishments. 2 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 payment. 3 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. This course is taught in two parts extending over two semesters. Part One relates information and experiential training in strategic planning, marketing, financial planning and other management issues. Part Two provides discussion of these topics as they relate to various practice environments.. 2 hours

770. **Clinical Education I.** Part-time clinical experience. Supervised clinical education in basic patient care skills and an introduction to practice issues. 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). These students have completed all academic course work except a one-month “mini-term” consisting of a synthesis seminar and presentation of their scholarly activity project. However, this is the first full-term clinical experience for these students. 8 hours

774. **Clinical Education V** Continuation of PT 773. 12 week full-time clinical education. Integration of all patient care techniques; evaluation of patient progress and appropriate progression of patients in therapeutic programs; includes experiences in supervision, consultation, research, management, and teaching. 9 hours

775 **Clinical Education VI.** Continuation of PT 774. Final, 12 week, full-time clinical education . Integration of all patient care techniques; evaluation of patient progress and appropriate progression of patients in therapeutic programs; ;includes experiences in supervision, consultation, research, management, and teaching. 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. 1-3 hours

799. Scholarly Activity Presentation. Oral presentation of scholarly project activity/results. 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.

Physical Therapy (DScPT)

PTDS 700 – 701 **Essentials in Medical Screening I and II.** Provides the physical therapist with knowledge and skills for recognizing systemic disease that may appear as/or in addition to movement-related dysfunction to enable the practicing therapist to appropriately determine the need for medical referral. Basic principles underlying pharmacological management of movement related pathologies commonly encountered by the physical therapist. Includes background information on laboratory tests, imaging studies and other common diagnostic procedures.

PTDS 702 **Advanced Movement Science.** Current theory and principles of movement and movement dysfunction including: study of tissue basis of movement, biomechanics, motor control, energy demands, and analysis of movement 3 hours

PTDS 703 **Current Issues in Movement Science** Use of technology (motion analysis, biofeedback, energy expenditure) for analyzing problems of movement across a variety of pathologies commonly encountered by the physical therapist. Current areas of research in movement science will be discussed. 3 hours

PTDS 704 **Principles of Clinical Decision Making** Overview of clinical decision making in other disciplines (particularly medicine/health), the evolution of clinical decision making in physical therapy, models of clinical decision making and their application to elements of patient/client management in physical therapy practice. Students will consider decision analysis, cost-effectiveness, and development of critical/clinical pathways. 3 hours

PTDS 705 **Clinical Decision Making In Physical Therapy** Provides physical therapists with understanding of principles of clinical decision making applies to the practice of physical therapy. Examination of statistical properties of specific tests and selection of appropriate tests used in the diagnostic process of classifying signs and symptoms to assign diagnoses used by physical therapist that reflect the impact of a condition on the individual's function. Students will apply the diagnostic process, develop prognosis and intervention plans based upon evaluation of findings. Multiple patient problems will be addressed. 3 hours.

PTDS 708 **Professional Development Seminar I** Provides students with the context of settings and roles in which an advanced doctoral degree in physical therapy may be used. Addresses topics such as professional ethics, leadership skills, and development of effective presentations and publications. 1 hour

PTDS 709 **Professional Development Seminar II** Provides students with an overview of academia and the roles and responsibilites of academic and clinical faculty members. Addresses job search and negotiation strategies,, portfolio development, and strategies for balancing personal and professional demands. 1 hour

PTDS 710 **Health Promotion in Physical Therapy** . Concepts of health promotion and the role of physical therapist in health promotion. Theoretical basis for health behaviors and application of theories to physical therapy practice. 3 hours

PTDS 711 **Health Program Planning and Administration.** Methods/techniques for health program assessments, evaluation, program planning. Communication skills/techniques unique to health program planning and implementation will be emphasized. 3 hours.

PTDS 712 **Program Evaluation and Health Policy** Study of program evaluation strategies and advocacy; includes utilization of evaluations and strategies to influence health policy as a clinician, consultant, and/or educator 3 hours

PTDS 720 **Introduction to Physical Therapy Clinical Outcomes** Concepts of biostatistics relative to evidence-based practice and foundation for outcome based clinical rehabilitation approaches. Overview of generic measures, domains of health, condition specific measures, satisfaction, treatment effect measures, severity, comorbidity, demographic and psychosocial factors. 3 hours

PTDS 721 **Foundations for Physical Therapy Outcomes Research I** Study of measurement theory characteristics, conceptualization, usefulness, sensitivity, specificity, and interpretation. Data management issues: selection, collection, display, information systems and organization of data. 3 hours

PTDS 722 **Foundations for Physical Therapy Outcomes Research II** In-depth study of strategies and issues specific to outcomes research in clinical physical therapy settings. Case based seminar intergrating knowledge from PT 720 and PT 721 3 hours

PTDS 740 **Practicum** Individually designed, directed experience in focus area appropriate to student's background, needs, and goals under guidance of faculty preceptor 3-6 hours

PTDS 713 **Field Experience in Health Promotion** Individually planned experience in community based setting. Intergration and application of principles and theory of health behavior/health education, policy analysis and advocacy 1 hour

PTDS 798 **Clinical Research/Dissertation Proposal** Development of clinical research proposal 1-3 hours

PTDS 799 **Clinical Research/Dissertation** Prerequisite: admission to candidacy 1-6 hours

Focus area courses: Students may elect course work offered within the university and/or larger community which will enhance the individual's long-range career goals. All students will select a focus area. Each focus area will have a required practicum. When students have completed the didactic course work for their focus area, they will then complete a practicum which is individually based upon experience and professional goals.

Focus area courses offered within the program:

PTDM 730 **Advanced Musculoskeletal I** An in-depth learning experience in the examination and treatment of individuals with musculoskeletal dysfunction involving the lower quarter. Previous coursework in medical screening, movement science, and clinical decision making in specifically applied to the musculoskeletal system. 4 hours

PTDM 731 **Advanced Musculoskeletal II** A continuation of PTDM 730 wit application to the upper quarter and thoracic region. 4 hours

PTDN 730 **Advanced Neuromuscular I** An in-depth learning experience focused on examination of individuals with neuromuscular dysfunction. Previous coursework in medical screening, movement science, an clinical decision making is specifically applied to the neuromuscular system 3 hours

PTDN 731 **Advanced Neuromuscular II** A continuation of PTDN 730 with emphasis on intervention strategies for neuromuscular dysfunction 3 hours

PTDC 730 **Advanced Clinical Outcomes I** In-depth study of strategies and issues specific to outcomes research in clinical physical therapy settings 3 hours

PTDC 731 **Advanced Clinical Outcomes II** Continuation of PTDS 730 content with integration on content from PT 712. Case based seminar series. 3 hours.

Surgical Physician Assistant Studies (M.S.P.A.S.)

Degree Offered:	M.S.P.A.S.
Director:	Herbert Ridings, MA, PA-C
Phone:	(205) 934-4605
E-mail:	**hridings@uab.edu**
Web site:	**www.uab.edu/shrp**

Faculty

William R. Drace, Instructor (SHRP).

John J. Gleysteen, Professor (Surgery).

Paul M. Harrelson, Instructor (Surgical Physician Assistant); Pain Management.

Patricia R. Jennings, , Associate Professor (SHRP); Infectious Diseases.

Doris A. Rapp, Associate Professor (SHRP).

Herbert D. Ridings, Associate Professor (SHRP); Family Medicine.

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 out-patient 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 are required to successfully complete the Physician Assistant National Certifying Examination sponsored by the National Commission on Certification of Physician Assistants.

Essential Requirements for the M.S.P.A.S. Degree

Fundamental tasks, behaviors, and abilities necessary to successfully complete the academic and clinical 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.

Program Curriculum
(Course requirements are listed in semester credit hours)

Fall Semester
PA 602 Human Physiology (5)
PA 603 Pharmacology I (3)
PA 605 Pathology (3)
PA 610 Clinical Laboratory Medicine (3)
PA 613 Surgical Techniques (2)
PA 615 Introduction to the PA Profession (1)

Spring Semester
PA 601 Human Gross Anatomy (4)
PA 604 Pharmacology II (3)
PA 606 Clinical Medicine I (4)
PA 608 Surgical Disease I (3)
PA 611 History and Physical Examination I (3)

Summer Semester

PA 614 Operating Room Techniques (2)
PA 616 Electrocardiography (1)
PA 619 Fundamental of Clinical Research (3)
AHS 530 Health Admin. & Management (3)

Fall Semester, 2

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 Literature Evaluation (2)

Clinical Year Required Rotations

PA 621 Cardiovascular Surgery (4)
PA 622 Emergency Medicine (4)
PA 623 General Surgery (4)
PA 624 Inpatient Medicine (4)
PA 625 Obstetrics and Gynecology (4)
PA 626 Outpatient Medicine (4)
PA 627 Orthopedics (4)
PA 628 Pediatrics (4)
PA 629 Psychiatry / Geriatrics (4)

Clinical Year Elective Rotations

PA 630 Neurosurgery (4)
PA 631 Outpatient Surgery (4)
PA 632 Plastic Surgery (4)
PA 633 Renal Transplantation (4)
PA 634 Surgical Oncology (4)
PA 635 Thoracic Surgery (4)
PA 636 Trauma Surgery (4)
PA 637 Other (4)

Other Requirements

PA 698 Master's Project (1)
PA 638 Senior Seminar I (2)
PA 639 Senior Seminar II (2)
PA 640 Senior Seminar III (2)

Admission

- Baccalaureate degree from an accredited college/university
- A minimum score of 1000 on the GRE
- A minimum cumulative undergraduate grade point average of 3.0 (A=4.0)
- A minimum cumulative grade point average of 3.0 in the program prerequisite courses, with a minimum grade of C in each
- Proof of current American Heart Association CPR certification
- Technical ability to complete the program
- Interview with faculty
- Satisfactory health screening by the UAB Medical Center Student Health Service.
- The following prerequisites:

    6 semester hours of Biology (for science majors)
    3-4 semester hours of Microbiology (lab preferred but not required)
    3-4 semester hours of Human Anatomy
    3-4 semester hours Human Physiology
    8-9 semester hours of General Chemistry
    3-4 semester hours of statistics (lab recommended but not required)
    9 semester hours of psychology (general, developmental, abnormal)

Appication Procedure:

This program participates in the Central Application Service for Physician Assistants (CASPA). Please consult www.caspaonline.org for more information regarding specific application procedures and fees. Requirements for the initial application are specified in the CASPA application materials. Applicants should not submit any materials related to the CASPA application to the UAB Surgical PA Program. CASPA will send the applicant's materials directly to the program. Following the program's receipt of the applicant's CASPA materials, the UAB Surgical PA Program will send a secondary program application to qualified applicants. Qualified applicants must complete and return the program's secondary application along with a $25 check payable to the UAB Surgical Physical Assistant Program. Students accepted to the professional phase will need to apply to UAB Graduate School.

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 October 15 preceding the expected term of enrollment.
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL is required for international applicants whose native language is not English.)

Financial Support

Scholarships exclusively 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 SHRP 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:
Program Director
Surgical Physician Assistant Program
School of Health Related Professions
University of Alabama at Birmingham
Birmingham, Alabama 35294-1270
Telephone: (205) 934-4605
E-mail:kpeoples@uab.edu

Web address: **www.uab.edu/surgicalpa**

Course Descriptions

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 teaches strategies that should be incorporated 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)

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)

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 may utilize guest lecturers and program faculty. (1 credit)

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)

PA 606. **Clinical Medicine I.** This is an introductory course in human disease and is designed to describe the pathologic processes involved in common

disorders and diseases. It introduces students to the principles of clinical medicine and clinical problem solving as well as providing them with the background needed for the clinical courses taught later in the curriculum. (4 Credits)

PA 607. **Clinical Medicine II.** This course presents the diagnosis and management of the most common clinical problems seen by primary care practitioners. This last course employs an organ systems approach incorporating relevant anatomy, physiology, pharmacology, pathology, radiology and nutrition into each section. (6 Credits)

PA 610. **Clinical Laboratory Medicine.** An introduction to laboratory diagnostics with an emphasis on pathology, microbiology, hematology, and clinical chemistry. This course utilizes a lecture format, specimen handling in a clinical laboratory as well as cost effective diagnostic algorithms in problem-based case scenarios. (3 Credits)

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)

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)

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)

PA 618. **Risk Management.** This course provides an introduction to the legal, political and professional issues affecting physician assistant practice. (1 credit)

PA 603. **Pharmacology I.** and PA 604. **Pharmacology II.** These 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 intermittent case studies requiring students to critically evaluate medical conditions and choose safe and effective medications in treating those conditions. (3 credits each)

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)

PA 617. **Applied Behavioral Medicine.** This course introduces students to human behavior, strategies and issues surrounding health education and theoretical models of how to change human behavior. 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 608. **Introduction to Surgical Diseases I.** This course introduces students to common surgical disorders with early emphasis on physiologic changes, medical requirements and evaluation of patients before, during, and after surgery. It also provides basic instruction in the diagnosis, management, and complications associated with common surgical gastrointestinal and urogenital disorders. (3 credits)

PA 609. **Introduction to Surgical Diseases II.** This course is delivered via didactic instruction and focuses on the preoperative evaluation and diagnosis, and post-operative management and treatment of common disorders of the heart, lungs, and vascular systems. (3 credits)

PA 613. **Surgical Care Techniques I.** PA 614. **Operating Room Techniques.** These are two in a series of courses providing didactic instruction and applied technical skills in surgical techniques and various invasive medical procedures. An animal surgery laboratory, using live pigs, is an essential component of PA 613. PA 614 places students in operating rooms in Birmingham area hospitals where they are taught the basics in surgical first assisting. (2 credits each)

PA 638, PA 639, PA 640. **Senior Seminar Series.** These courses focus on a review of primary care medicine topics to prepare students for the PA National Certification Examination (PANCE). They also require students to orally present two 30-minute presentations to the class on pre-assigned topics and prepare 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. (6 credits total)

PA 621-PA 637. **Clinical Services I-XII.** The 12 month clinical phase is composed of 9 required and 3 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. Clinical year students return to campus each week to participate in a seminar series and evaluation exercises. (4 credits/rotation)

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)

MEDICINE

Gerontology

Certification Program

Director:	Dr. Patricia L. Sawyer
Phone:	(205) 934-4399
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

Curtis, Angela R.; Geriatric Education Manager (Division of Gerontology and Geriatric Medicine)

Drentea, Patricia; Associate Professor (Sociology); Socioeconomic Aspects of Aging, Health and Disability, and Work and Family, Research Methods

Fordham, Pamela; Assistant Professor with Doctorate; (Nursing) End of life issues for patients and family.

Galvin, Melissa; Associate Professor (Health Behavior); Community-Based Interventions, Health Promotion

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

Wadley, Virginia; Assistant 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

Deadline for Entry Term(s):	Each semester
Graduate Catalog Description	**http://main.uab.edu/show.asp?durki=24894**

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 205-934-4399

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. >

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**. Medical and health issues related to older adults. Physical and psychological aspects of normal aging, principles of geriatric medicine, including clinical presentation and functional assessment of older adults, age-related diseases, and geriatric syndromes. 3 hours.

GRD 603: **Spirituality in Late Life**. This course will examine theories of aging as related to spiritual development in late life, research on spirituality and aging, practical methods for addressing spirituality in work with older persons and the community, and policy implications of including spirituality in aging services. A multidisciplinary approach will be utilized along with an emphasis on personal and professional development within the context of each student's primary discipline. 3 hours.

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.

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.

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. Robinna Lorenz
Phone:	(205) 934-0676 or 934-4092
E-mail:	**rlorenz@uab.edu**
Web site:	**http://www.uasom.uab.edu/mdphd/**

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 broad areas of biochemistry, biomedical engineering, cell biology, molecular genetics, epidemiology, cell biology, microbiology, neurobiology, pathology, pharmacology, and physiology.

Individuals admitted to this highly competitive program must have excellent undergraduate academic record and MCAT score. 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 7.5 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.uasom.uab.edu/mdphd/admissions.html**.

Students who have initiated study in the School of Medicine may also apply to the MD/PhD Program. Please contact the MSTP Director for further information.

NATURAL SCIENCES AND MATHEMATICS

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

Degree Offered:	Ph.D., M.S.
Director:	*Watts*
Phone:	(205) 934-8308
E-mail:	**sawatts@uab.edu**
Web site:	**www.uab.edu/uabbio**

Faculty

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

Robert A. Angus, Professor (Biology); Population Biology, Genetics of Fish, Environmental Biology

Richard B. Aronson, Adjunct Professor (DISL); Marine Communities and Dynamics

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

Larry R. Boots, Adjunct Professor; Reproductive Endocrinology

George F. Crozier, Jr., Adjunct Professor (Biology); Physiology and Biochemistry of Marine Organisms

Joseph J. Gauthier, Associate Professor (Biology - Retired); Applied and Environmental Microbiology

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

Thomas S. Hopkins, Adjunct Professor (Biology); Marine Biology

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

Daniel D. Jones, Professor Emeritus (Biology); Microbial Ecology, Plant Physiology

David W. Kraus, Associate Professor (Biology); Comparative Invertebrate Physiology

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

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

Timothy R. Nagy, Associate Professor (Nutrition Sciences); Ecophysiology, Energetics, and Body Composition

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

Trygve Tollefsbol, Associate Professor (Biology); Developmental Biology and Molecular Biology of DNA Methylation

R. Douglas Watson, Professor (Biology); Endocrinology, Neuroendocrinology, Insect Development

Stephen A. Watts, Professor (Biology); Nutrition, Physiology and Growth of Marine and Aquatic Organisms; Aquaculture

Thane Wibbels, Associate 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 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, thesis or comprehensive review paper (Plan II), 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 205-934-8308

Fax 205.975.6097

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

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

Physical Address

UAB Department of Biology, Campbell Hall, Room 109, 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. **Advanced Biology for Teachers I.** Basic genetic principles; recent research developments. Prerequisite: Permission of instructor.

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

503. **Advanced Biology for Teachers III**. Laboratory supplementing lecture (BY 502) through use of human specimens, models, and demonstrations. Corequisite: BY 502. 1 hour.

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**. Principles of chemical communication in animals. Use of invertebrate and vertebrate systems. Prerequisite: BY 309 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.

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.

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.

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.

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. **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.

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

*596. **Special Topics in Biology II**. Lecture, laboratory, or both. 1-2 hours.

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**. Special physical and chemical processes occurring at cell tissue, and organ levels. Independent projects required. Prerequisite: BY 309 or permission of instructor.

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.

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.

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.

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 104 and either BY 330, BY 450, and CH 462, or permission of instructor. Lecture and laboratory. 4 hours.

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.

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.

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.

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.

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. 1-2 hours.

*696. **Special Topics in Biology II**. Lecture, laboratory, or both. 1-2 hours.

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

*698. **Nonthesis Research**. 1-10 hours.

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

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

771. **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.

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.

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.

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:	*Graves*
Phone:	(205) 975-8094
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.

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. I have actively pursued 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, Assistant Professor (Chemistry); Chemical Education, development of novel methods for enhancing organic chemistry instruction and student retention.

William K. Nonidez, Associate Professor (Chemistry); Analytical Chemistry, Applying Matrix Assisted Laser Desorption Ionization Time of Flight Mass Spectrometry (MALDI-TOF-MS) to the study of polymers and oligomers, Novel Flow System Detectors, Electrochemistry, Chemiluminescence, X-ray Fluorescence.

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, Assistant 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.

Charles L. Watkins, Professor (Chemistry); Physical Chemistry, study of the reaction chemistry of group 13, 14, and 15 element - containing compounds by application of NMR spectroscopic, x-ray structural , and theoretical calculation techniques.

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.

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**.

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
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.

555. Analytical Chemistry II for Graduate Study. General operating principles and quantitative applications of commonly used analytical instruments. Prerequisite: CH 550. Spring.

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.

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.

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.

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.

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

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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.

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.

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.

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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.

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

Degree Offered:	Ph.D., M.S.
Director:	*Johnstone*
Phone:	(205) 934-2213
E-mail:	**jkj@uab.edu**
Web site:	**www.cis.uab.edu/graduate/**

Faculty

Purushotham V. Bangalore, Assistant Professor (Computer and Information Sciences); Grid Computing, High Performance Computing

Barrett R. Bryant, Professor and Associate Chair (Computer and Information Sciences); Programming Languages, Compiler Design, Object-Oriented Technology

Jeffrey G. Gray, Assistant Professor (Computer and Information Sciences); Software Engineering, Model-Driven Engineering, Aspect-Oriented Software Development, Generative Programming

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

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

Kevin D. Reilly, Professor (Computer and Information Sciences); Cognitive Modeling, Neural Nets, Expert Systems

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

Kenneth R. Sloan, Associate Professor (Computer and Information Sciences); Computer Graphics, Anatomy of the Retina

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

Chengcui Zhang, Assistant 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.

Opportunities are available for a Ph.D. specialization in bioinformatics in collaboration with the UAB Academic Health Center.

Additional Information

Deadline for Entry Term(s):	February 1 for Fall; September 15 for Spring.

Contact Information

For detailed information, contact Dr. Tony Skjellum, Professor and Chair, UAB Department of Computer and Information Sciences, Campbell Hall, Room 115-A, 1300 University Boulevard, Birmingham, Alabama 35294-1170.

Telephone 205-934-2213

E-mail **tony@cis.uab.edu**

Web **www.cis.uab.edu**

Course Descriptions

Computer and Information Sciences (CS)

All courses require permission of the student's academic advisor. All 500-level and 600-level courses carry 3 semester hours of credit, unless otherwise specified. All 700-level courses carry 2 or 3 hours of credit, unless otherwise specified.

505. **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. BB. Prerequisites: CS303 and CS350 (with grades of C or better). 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. BB. Prerequisite: CS 303 (with grade of C or better). 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. JG. Prerequisite: CS 303 (with grade of C or better). 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 allocatioin, file and directory management, file/user security and file access methods. AB. Prerequisites: Graduate Standing. 3 hours.

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. RH. 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. RH. Prerequisite: Graduate Standing. 3 hours.

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. AS. Prerequisites: CS 250, CS 302 & MA 125 (with grades of C or better). 3 hours.

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

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

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. JG. Prerequisites: CS 250. 1 hour.

598. **Practical Work Experience**. Credit for Working in the computer science field. Does not count toward M.S. degree BB. 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. BB. 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. BB. 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. BB. Prerequisite: CS 505 or equivalent. 3 hours.

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

608. **Programming Languages Seminar**. Pass/Fail. BB. 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. CZ. 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. CZ. 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. CZ. 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. CZ. 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. CZ. 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. CZ. Prerequisites: CS 510. 3 hours.

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

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

621. **Software Development II**. Design techniques for large-scale systems, portability, life-cycle cost considerations, maintenance, software design methodologies. JG. Prerequisites: Graduate Standing. 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). JG. Prerequisites: CS 303. 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. BB. Prerequisites: CS 505. 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. KR. Prerequisites: Graduate Standing. 3 hours.

628. **Software Development 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. JG. 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. JG. 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. RH. Prerequisites: CS 303& 330 with a grade of C or better. 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. PB. Prerequisites: CS 330 with a grade of C or better. 3 hours.

632. **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. PB. Prerequisites: CS 304 & CS 330 with a grade of C or better or MA 360. 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. PB. Prerequisites: CS 361 & CS 362. 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. TS. Prerequisite: Graduate Standing. 3 hours.

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

638B. **Computer Systems Seminar**. Lectures & discussion on advanced topics in Computer Systems. PB. 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. PB. 1-3 hours.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

671. **Shape Design**. Shape design for graphics, game design, bioinformatics and CAD/CAM. Bezier curves and surfaces, B-splines, interpolation, polygonal meshes, subdivision surfaces, implicit curves and surfaces, swept surfaces, boundary representation, contour reconstruction. JJ. Prerequisites: Graduate Standing or Permission of Instructor. 3 hours.

672. **Motion Design**. Motion design for graphics, animation, game design, and robotics. Orientation control, quaternion splines, basics of Bezier curves and surfaces, camera control, motion planning, collision detection, cinematography, visibility analysis. JJ. Prerequisites: Graduate Standing or Permission of Instructor. 3 hours.

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

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

678. **Graphics and Image Processing Seminar**. Pass/Fail. KS. 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. JJ. Prerequisites: Permission of Instructor. 3 hours.

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

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

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

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

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

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

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

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

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

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

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

700. **Topics in Programming Language Semantics**. BB. Prerequisites: Graduate Standing. 2-3 hours.

701. **Topics in Program Verification**. BB. Prerequisites: Graduate Standing. 2-3 hours.

702. **Topics in Compiler Design**. BB. Prerequisites: Graduate Standing. 2-3 hours.

703. **Topics in Compiler Design**. BB. Prerequisites: Graduate Standing. 2-3 hours.

708. **Topics in Programming Languages Seminar**. BB. Prerequisites: Graduate Standing. 2-3 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. CZ. Prerequisites: Cs 510 or equivalent. 2-3 hours.

711. **Topics in Database Systems**. CZ. Prerequisites: Graduate Standing. 2-3 hours.

712. **Topics in Knowledge-Base Systems**. CZ. Prerequisites: Graduate Standing. 2-3 hours.

713. **Topics in Object-Oriented Database Systems**. CZ. Prerequisites: Graduate Standing. 2-3 hours.

714. **Topics in Distributed Database Systems**. CZ. Prerequisites: Graduate Standing. 2-3 hours.

715. **Topics in Multimedia Database**. CZ. Prerequisites: Graduate Standing. 2-3 hours.

718. **Topics in Database Systems Seminar**. CZ. Prerequisites: Graduate Standing. 2-3 hours.

720. **Topics in Software Development I**. JG. Prerequisites: Graduate Standing. 2-3 Hours.

721. **Topics in Software Development II**. JG. Prerequisites: Graduate Standing. 2-3 Hours.

722. **Topics in Reflective and Adaptive Systems**. JG. Prerequisites: Graduate Standing. 2-3 Hours.

724. **Topics in Formal Specification of Software Systems**. BB Prerequisites: Graduate Standing. 2-3 hours.

725. **Topics in Metrics & Performance**. KR Prerequisites: Graduate Standing. 2-3 hours.

728. **Topics in Software Development Seminar**. JG. Prerequisites: Graduate Standing. 2-3 hours.

730. **Topics in Computer Systems**. RH. Prerequisites: Graduate Standing. 2-3 hours.

731. **Topics in Distributed Computing**. PB. Prerequisites: Graduate Standing. 2-3 hours.

732. **Topics in Parallel Computing**. PB. Prerequisites: Graduate Standing. 2-3 hours.

733. **Topics in Grid Computing**. PB. Prerequisites: Graduate Standing. 2-3 hours.

736. **Topics in Computer Security**. TS. Prerequisites: Graduate Standing. 2-3 hours.

738A. **Topics in Computer Systems Seminar**. PB. Prerequisites: Graduate Standing. 2-3 hours.

738B. **Topics in Computer Systems Seminar**. PB. Prerequisites: Graduate Standing. 2-3 hours.

740. **Topics in Bioinformatics**. TS. Prerequisites: Graduate Standing. 2-3 hours.

741. **Topics in Bioinformatics**. TS. Prerequisites: Graduate Standing. 2-3 hours.

748. **Topics in Bioinformatics Seminar**. TS. Prerequisites: Graduate Standing. 2-3 hours.

750. **Topics in Automata Theory**. AS. Prerequisites: Graduate Standing. 2-3 hours.

751. **Topics in Formal Language Theory**. BB. Prerequisites: Graduate Standing. 2-3 hours.

752. **Topics in Design and Analysis of Algorithms**. AS. Prerequisites: Graduate Standing. 2-3 hours.

753. **Topics in Computational Geometry**. AS. Prerequisites: Graduate Standing. 2-3 hours.

758. **Theoretical Foundations Seminar**. AS. Prerequisites: Graduate Standing. 2-3 hours.

760. **Topics in Artificial Intelligence**. KR. Prerequisites: Graduate Standing. 2-3 hours.

761. **Topics in Expert Systems**. KR. Prerequisites: Graduate Standing. 2-3 hours.

762. **Topics in Natural Language Processing**. BB. Prerequisites: Graduate Standing. 2-3 hours.

763. **Topics in Knowledge Discovery & Data Mining**. AS. Prerequisites: Graduate Standing. 2-3 hours.

764. **Topics in Knowledge Representation**. KR. Prerequisites: Graduate Standing. 2-3 hours.

765. **Topics in Neural Networks**. KR. Prerequisites: Graduate Standing. 2-3 hours.

768. **Artificial Intelligence Seminar**. KR. Prerequisites: Graduate Standing. 2-3 hours.

770. **Topics in Computer Graphics**. JJ. Prerequisites: Graduate Standing. 2-3 hours.

771. **Topics in Shape Design**. JJ. Prerequisites: Graduate Standing. 2-3 hours.

772. **Topics in Motion Design**. JJ. Prerequisites: Graduate Standing. 2-3 hours.

773. **Topics in Computer Vision**. KS. Prerequisites: Graduate Standing. 2-3 hours.

775. **Topics in Computer Visualization**. KS. Prerequisites: Graduate Standing. 2-3 hours.

778. **Graphics and Image Processing Seminar**. KS. Prerequisites: Graduate Standing. 2-3 hours.

780. **Topics in Numerical Computing Foundations**. JJ. Prerequisites: Graduate Standing. 2-3 hours.

781. **Topics in Simulation Models and Animations**. KR. Prerequisites: Graduate Standing. 2-3 hours.

782. **Topics in Simulation, Methodology, and Application**. KR. Prerequisites: Graduate Standing. 2-3 hours.

788. **Topics in Geometric Modeling Seminar**. JJ. Prerequisites: Graduate Standing. 2-3 hours.

790. **Special Topics**. BB. Prerequisites: Graduate Standing. 2-3 hours.

791. **Special Topics**. BB. Prerequisites: Graduate Standing. 2-3 hours.

792. **Special Topics**. BB. Prerequisites: Graduate Standing. 2-3 hours.

793. **Special Topics**. BB. Prerequisites: Graduate Standing. 2-3 hours.

794. **Special Topics**. BB. Prerequisites: Graduate Standing. 2-3 hours.

796. **Directed Readings and Research**. JJ. Prerequisites: Permission of Instructor. 1-6 hours.

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

Mathematics (M.S.)

Degree Offered:	Ph.D., M.S.
Director:	*Karpechina*
Phone:	(205) 934-2154
E-mail:	**karpeshi.uab.edu**
Web site:	**www.math.uab.edu**

Faculty

Alexander Blokh, Professor (Mathematics); Dynamical Systems.

James J. Buckley, Associate Professor (Mathematics); Analysis, Econometrics, Operations Research

Nikolai Chernov, Professor (Mathematics); Dynamical Systems, Ergodic Theory

Louis Dale, Professor (Mathematics); Ring Theory

Christian Hainzl, Assistant Professor (Mathematics); Mathematical Physics

Marcel Griesemer, Associate Professor (Mathematics); Mathematical Physics

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 (Mathematics); Differential Equations, Spectral Theory

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 (Mathematics); Scattering Theory, 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 (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
Graduate Catalog Description	M.S.**http://main.uab.edu/show.asp?durki=24908**
Graduate Catalog Description	Ph.D.**http://main.uab.edu/show.asp?durki=24909**

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 **www.math.uab.edu**

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 513-519 and 540-541 may not be counted toward a graduate degree in mathematics.

513. **Geometry for Teachers**. Topics may include foundations of Euclidean and non-Euclidean geometry, construction problems, elementary theory of area, projective geometry, Klein's Erlanger Programme. Prerequisite: MA 141.

514. **Real Number System**. Axiomatic development of properties of real number system for development of mathematical maturity. Prerequisite: MA 141.

515. **Set Theory and Logic**. Basic principles of elementary logic and naïve set theory. Prerequisite: MA 141.

517. **Theory of Equations**. Existence, properties, and methods of finding solutions to polynomial equations. Prerequisite: MA 142.

518. **Statistics for Teachers**. Descriptive and inferential statistics, probability distributions, estimation, hypothesis testing. Prerequisite: MA 102.

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.

531. **Linear Algebra II**. Characteristic polynomials and roots, Jordan canonical form, inner product spaces. Prerequisite: MA 330.

534. **Algebra I**. 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**. 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.

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.

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.

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.

580, 581. **Statistical Analysis I, II**. Applications of statistical techniques, tests of significance and confidence intervals, analysis of variance, analysis of covariance, orthogonal contrasts and multiple-range procedures, simple and multiple linear regression, design of experiments. Prerequisite: MA 243.

585. **Introduction to Probability**. Sample spaces, combinatorics, absolute and conditional probability, discrete and continuous random variables, probability distributions and density functions. Prerequisite: MA 244.

590. **Math Seminar**. Topics vary; may be repeated for credit. Prerequisites vary with topics. 1-3 hours.

591-597. **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**. Graduate program or permission of instructor 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; L^p 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 MA 645 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.

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, 662**. Numerical Differential Equations I, II**. Finite difference methods, consistency, stability and convergence for linear multistep methods for ODE, Runge-Kutta methods linear second-order PDE, parabolic equations, Crank-Nicholson and ADI, von Neumann stability analysis, method of lines, first-order hyperbolic systems, method of characteristics, CIR method, Lax-Wendroft schemes, shooting methods for ODE boundary value problems, invariant embedding, finite element methods, introduction to Sobolev spaces, Gateaux derivative and optimization of functionals, variational formulation of boundary value problems, Euler-Language equation, Lax-Milgram lemma, Ritz and Galerkin methods. Prerequisite: MA 660 or 632.

663-665. **Operations Research I-III**. Mathematical optimization techniques. Formulation, solution, and analysis of problems arising from business, engineering, and science. Prerequisite: MA 244.

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 I**. 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.

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.

Degree Offered:	Ph.D., M.S.
Director:	*Karpechina*
Phone:	(205) 934-2154
E-mail:	**karpeshi.uab.edu**
Web site:	**www.math.uab.edu**

Faculty

Alexander Blokh, Professor (Mathematics); Dynamical Systems.

James J. Buckley, Associate Professor (Mathematics); Analysis, Econometrics, Operations Research

Nikolai Chernov, Professor (Mathematics); Dynamical Systems, Ergodic Theory

Louis Dale, Professor (Mathematics); Ring Theory

Christian Hainzl, Assistant Professor (Mathematics); Mathematical Physics

Marcel Griesemer, Associate Professor (Mathematics); Mathematical Physics

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 (Mathematics); Differential Equations, Spectral Theory

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 (Mathematics); Scattering Theory, 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 (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 **www.math.uab.edu**

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.

790-797. **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:	*Vohra*
Phone:	(205) 934-6662
E-mail:	**ykvohra@uab.edu**
Web site:	**www.phy.uab.edu**

Faculty

David G. Agresti, Professor "Emeritus" (Physics); Mössbauer Spectroscopy, Planetary Materials, Computer Data Fitting, Mars Surface Data Analysis

Ivan A. Brezovich, Professor (Radiation Oncology); Physics of Radiation Oncology, Hyperthermia

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.

Aaron Catledge, Research Assistant Professor (Physics); Materials Science. Synthesis and properties of nanostructured super-hard materials; Chemical vapor Deposition (CVD) of diamond films and novel nanostructured coatings for biomedical implants; mechanical properties Electrospun scaffolds for bone regeneration.

Herbert C. Cheung, Professor (Biochemistry and Molecular Genetics); Time-Resolved Fluorescence Spectroscopy and Rapid Kinetics of Proteins, Mechanism of Muscle Contraction

Perry A. Gerakines, Associate Professor (Physics); Infrared Astronomy, Laboratory Astrophysics, Interstellar Dust and Ices, Comets, Astrobiology

Gary J. Grimes, Professor (Electrical and Computer Engineering); Photonic Switching and Fiber Optics, Polymer Waveguides, Integrated Optics

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.

Rakesh Kapoor, Assistant Professor (Physics); Biophotonics, Biophysics; Bioimaging; Up Converting Materials; Biosensors and Nanostructured Biomaterials.

Ryoichi Kawai, Associate Professor (Physics); Condensed Matter Physics Theory, Computational Physics, Science of Complexity

N. Rama Krishna, Professor (Biochemistry and Molecular Genetics); High-Field NMR Studies of Biomolecules, Biomolecular Structure and Function, Motional Dynamics of Proteins, Development of NMR Methodologies for Structure Refinement.

Chris M. Lawson, Professor (Physics); Nonlinear Optics, Fiber Optics, Optical Sensor

James C. Martin, Associate Professor (Physics); Conformations of Biological Macromolecules, Laser Light Scattering, Fluorescence Photobleaching

Sergey B. Mirov, 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); Laser Beam Shaping Optics, Optical System Design, Theoretical Optics, High Performance Computing, Internet2

Andrei Stanishevsky, Assistant Professor (Physics); Nanomaterials, thin films, nanostructures, biomedical and optical applications of nanomaterials and nanodevices

Georgiy Tsoi, Research Assistant Professor (Physics); Magnetic Nanomaterials: Synthesis, Properties, and Applications.

Yogesh K. Vohra, Professor & University Scholar (Physics); High Pressure Materials Research, Growth and Characterization of Synthetic Diamond and Biomaterials, Laser Spectroscopy and Synchrotron X-ray Diffraction in Materials Characterization

Thomas J. Wdowiak, Associate Professor “Emeritus” (Physics); Laboratory Astrophysics, Interstellar Matter, Meteorites, Early Solar System

Edward L. Wills, Research Associate Professor (Physics); Experimental Nuclear Physics, Biomedical Applications, Mössbauer Spectroscopy

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, and the letters of evaluation, usually from former instructors. For international students, a TOEFL score of 570 is required for admission.

Beginning the Program

All students must take an oral placement examination on basic physics concepts before registering for any courses. Upon arrival at UAB, international students will be required to take English as a Second Language course or Scientific Communication courses at UAB during their first year of study until a score equivalent to 570 on the TOEFL is achieved.

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

All students are required to pass an oral and written qualifying examination covering the areas of classical mechanics, electromagnetic theory, quantum physics, and one selected topic from astrophysics, optics, or solid-state physics, or topics recommended by the graduate committee. This examination is to be taken within two terms of completing six 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 student's Graduate Study Committee, chaired by the major advisor, will outline a program of study including at least four graduate courses and appropriate tools of research, such as computer and/or foreign language competency. After the student completes these specialization courses and tools of research, the Graduate Study Committee 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. Then, 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.

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**.

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
Graduate Catalog Description	**http://main.uab.edu/show.asp?durki=24926**

For detailed information, contact Dr. Yogesh K. Vohra, UAB Department of Physics, CH 387, 1530 3rd Avenue South, Birmingham, AL 35294-1170.

Telephone 205-934-4736

E-mail **ykvohra@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. Prerequisite: PH222. 3 hours.

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. Prerequisite: PH222. 3 hours.

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. Prerequisite: PH 222 or equivalent.

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. Prerequisite: PH 222 or equivalent. Lecture and laboratory.

528. **Physical Optics**. Interference and diffraction phenomena; emission, propagation, and absorption of radiation; polarization and dispersion; stimulated emission. Prerequisite: PH 222 or equivalent. 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. Prerequisites: PH 222 and MA 444, or equivalent. 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 251 and PH 562, PH 252 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. Prerequisites: PH 222 and MA 252. 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. Prerequisites: PH 222. 3 hours each.

585. **Laser Spectroscopy**. Practical applications of lasers and modern techniques and instrumentation in laser spectroscopy. Prerequisites: PH 222.

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. Prerequisites: PH 222, MA 252. 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 331, 551. 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 546 and 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). Demonstrations on thin-film deposition and basic characterization of film microstructure and properties. Prerequisites: PH553/653 and PH554/654 or permission of instructor. Lecture and demonstration. 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 546, 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. **Physics Student Seminar.** Recent topics in physics presented by graduate students in order to provide experience in a seminar environment.

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.

NURSING

Nursing (Ph.D., M.S.N.)

Degree Offered:	Ph.D., M.S.N.
Director (Ph.D.):	*Pryor*
Phone:	(205) 975-7529
E-mail:	**erpphd@uab.edu**
Web site:	**http://www.uab.edu/son**

Faculty

Susan Appel, Assistant Professor (Nursing); Prevention of Cardiovascular Disease, Metabolic Syndrome, Diabetes Management, Health of Minority Women

Pamela Autrey, Assistant Professor (Nursing); Nursing Administration, Rural Healthcare Policy and Politics, Organizational Quality

Kathleen Brown, Professor (Nursing); Community Health Nursing, Occupational Health, Back Injury Prevention

Carol Dashiff, Professor (Nursing); Family Intervention, Parent-Adolescent Communication, Family Processes Influencing Adolescent Autonomy, and Self-Care in Health and Chronic Illness

Anne Foote, Associate Professor (Nursing); Aging, Neuroscience Nursing

Pamela Fordham, Assistant Professor (Nursing); Palliative Care, Death and Dying, Nursing Education

Joan Grant, Professor (Nursing); Family Caregiving, Stroke, Telehealth Interventions

Lynda Harrison, Professor (Nursing); Maternal-Child Health, Latino Health, Evaluation of Interventions for Preterm Infants, Parent/Adolescent Education Programs

Gail Hill, Associate Professor (Nursing); Health Systems, Acute Care

Jean Ivey, Associate Professor (Nursing); Adolescent Health, Adolescent Parenting, Health Promotion in Children and Adolescents, Obesity in Children and Adolescents

Vicki Johnson, Assistant Professor (Nursing); Urinary Dysfunction, Muscle Adaptation to Exercise

Angela Jukkala, Assistant Professor (Nursing); Neonatal Outcomes in Rural Hospitals

Duck-Hee Kang, Professor (Nursing); Psychoneuroimmunology, Immune Responses and Stress in Asthmatic Youth and Cancer Patients

Norman Keltner, Professor (Nursing); Psychopharmacology, Psychiatric Nursing

Alberta McCaleb, Professor (Nursing); Self-Care Activities in Adolescents, Health Promotion in Children, Nursing Workforce Development

Teena McGuinness, Professor (Nursing); Advanced Practice Psychiatric Nursing, Mental Health of Children and Adolescents, International Adoption, Community Mental Health

Rhonda McLain, Assistant Professor (Nursing); Family Issues in Acute Illness/Critical Care, Cardiovascular Disease, Nursing Education

Linda Moneyham, Professor (Nursing); Women's Health, Women with HIV/AIDS

Jacqueline Moss, Associate Professor (Nursing); Nursing Informatics; Determination, Organization, and Dissemination of Clinical Information

Erica Pryor, Assistant Professor (Nursing); Disaster and Emergency Preparedness, Epidemiology of Emerging Infectious Diseases

Marti Rice, Professor (Nursing); Effects of Individual, Psychosocial, and Behavioral Factors on Biological Responses and Health Outcomes in School-Age Children

Jill Ross, Assistant Professor (Nursing); Sexual Behavior in Adolescents, Rape and Domestic Violence, Violence towards Vulnerable Populations

Karen Hughes Saenz, Assistant Professor (Nursing); Child/Adolescent Obesity

Glenda Smith, Assistant Professor (Nursing); Child Health, Cultural Health Practices, Alternative Therapies, Health Promotion and Disease Prevention

Elizabeth Stullenbarger, Professor (Nursing); Nursing Education and Administration, Research Synthesis Techniques, Child Health

Anne Turner-Henson, Professor (Nursing); Children's Environmental Health (Asthma and Second-Hand Smoke), Children with Special Health Care Needs, Caregiving within Families

Mary Umlauf, Professor (Nursing); Gerontology and Adult Health, Sleep, International Nursing

David Vance, Assistant Professor (Nursing); Aging with HIV, Cognitive Training and Cognitive Aging, Successful Aging, Alzheimer's Disease and Dementia Care, Spirituality and Religiosity

Janice Vincent, Assistant Professor (Nursing); Caring Behaviors of Nurses and Parental Stressors with Critically Ill Children, Tool Development, Neuman Model, Health Promotion in Children

Michael Weaver, Professor (Nursing); Health Promotion, Occupational Health, Biostatistics, Statistical Genetics

Anne Williams, Assistant Professor (Nursing); Stroke Victims, Caregiving

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. 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.

Program Goals

The 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.

Admission Requirements

In addition to the requirements of the UAB Graduate School, admission to this program depends upon the following criteria:

- 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.

  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.

- A combined score of at least 1100 on the verbal and quantitative sections of the Graduate Record Examinations (GRE); plus an indication of writing skills. The scores must not be over 5 years old.

- 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.

- 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 that demonstrates the applicant's scholarship potential.

- A current curriculum vita.

- Three (3) references from individuals with expertise to comment on the applicant's capability for research and scholarship; at least one of the references must be from a doctorally prepared nurse.

- A personal interview.

Individuals who do not meet the above criteria will be considered on an individual basis.

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 in the School of Nursing;

- 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.

M.S.N. and Postmaster's Programs in Nursing

For information on the Master of Science in Nursing Program, and the Post MSN Advanced Study in Nursing for certification as a nurse practitioner, please see the UAB School of Nursing catalog or contact the office of Student Affairs, UAB School of Nursing, 1530 3rd

Avenue South, Birmingham, AL 35294-1210 (telephone 205-975-7529) or visit the School of Nursing web page available at: **http://www.uab.edu/son/.**

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. Special faculty strength supports postdoctoral study in the areas of physical exercise, functional status, psychoneuroimmunology, health promotion and family caregiving.

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://main.uab.edu/sites/nursing/9295/** or contact the Office of Development in the School of Nursing at (205) 975-8936.

Other Policies of the School of Nursing

All students enrolled in clinical nursing courses 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 online 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:	Three
Entrance Tests	Variable
Comments	See School of Nursing website for details
Graduate Catalog Description	

For detailed information regarding the PhD in Nursing program, contact Dr. Erica Pryor, Doctoral Program Coordinator, UAB School of Nursing, NB 235, 1530 3rd Avenue South, Birmingham, AL 35294-1210.
Telephone 205-975-7529
E-mail **erpphd@uab.edu**
Web **http://www.uab.edu/son/**

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.

NBB 760. **Biobehavioral Foundations in Nursing Research**. Biobehavioral interactions among psychological and cognitive domain, social and environmental domain, and biology as they affect health outcomes. The emphasis will be placed on theories and concepts of each domain of biobehavioral interactions. 3 hours. Fall

NBB 761. **Biobehavioral Research: State of the Science**. In-depth exploration and critical analysis of current biobehavioral interaction research including conceptual and methodological issues. In addition, the course will be focused on examining the effectiveness of interventions on biobehavioral domains and health outcomes and identifying future directions for research. 3 hours. Spring.

NFH 760. **Family Health and Caregiving Across the Lifespan**. A survey of current research related to the reciprocal relationship between the family and health and caregiving within the context of the family lifespan. The student develops an understanding of health and illness within a framework of human development, interaction and adaptation, as well as cultural and gender norms. 3 hours. Spring

NFH 761. **Theory Development in Family Health and Caregiving**. Skill development in evaluating selected family and caregiving theories for their current or potential relevance to research on family health and individual health in the context of the family, and family caregiving processes in health and illness. 3 hours. Summer

NFH 762. **Family Research Methods**. Skill development in the critical analysis and application of family research methods as a foundation for conducting 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 hours. Summer.

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 hours. Spring

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 hours. Spring.

NRM 770. **Designs for Nursing Studies I**. 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

supports an identified area of research, and the discussion of the type of research design. 3 hours. Fall.

NRM 771. **Methods/Measurement in Nursing Research**. Overview of the theories, principles, and techniques that yield reliable and valid measurement of human systems. 3 hours. Spring.

NRM 772. **Designs for Nursing Studies II**. Design, sampling, collection of data, data analysis plans, presentation of findings, conclusions in various research designs and the reintegration of these into the body of knowledge in an identified focal area of research. Ethical and cultural issues related to the conduct of research will be addressed. Students will develop a research proposal. 3 hours. Spring

NRM 773. **Qualitative Research Methods**: This is a survey course, which focuses on the analysis of research traditions that guide the collection and analysis of qualitative data in the development of nursing science. Included are naturalistic, conceptual, interpretive and analytical research methods such as phenomenology, grounded theory, ethnography and narrative analysis. In addition, the course includes an analysis of strategies for mixed method designs. 4 hours. Spring.

NST 776. **Linear Models for Clinical Nursing Research**. Survey course on the application of advanced General Linear Model and related techniques in health care research. 3 hours. Spring.

NST 777. **Multivariate Statistical Methods for Clinical Nursing Research**. 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 hours. Summer.

NUR 706. **Theory Building in Nursing**. The nature of knowledge in practice disciplines with an emphasis on critical analysis of selected theories and concepts, approaches to theory and conceptual development, and criteria for evaluation of theory. 4 hours. Fall.

* NUR 730. **Special Topics**. A special topic seminar with variable focus. 1-3 hours. Each Term. (TBA)

* NUR 790. **Independent Study in Nursing**. Pass/Fail. 1-9 hours.

* NUR 791. **Independent Study in Nursing Practice**. Pass/Fail. 1-9 hours.

* NUR 798. **Research Practicum**. A series of course credits taken throughout the student's doctoral coursework to provide continuous research experience under the supervision of the mentor. Credits may vary by term, from a minimum of one hour credit to a maximum of nine hours credit. Offered every term. Pass/Fail. 1-9 hours.

* NUR 799. **Dissertation Research**. Prerequisites: Comprehensive Exam, admission to candidacy and IRB approval. Pass/Fail. 1-9 hours.

PUBLIC HEALTH

Public Health (including M.P.H., M.S.P.H., and Dr. P.H.)

MPH Concentrations:	Biostatistics Environmental Health/Toxicology Industrial Hygiene Industrial Hygiene/Hazardous Substance Occupational Health & Safety Epidemiology Health Behavior Health Care Organization Public Health Preparedness Management General Theory & Practice Health Policy Maternal & Child Health International Health & Global Studies
MSPH Concentrations:	Environmental Health/Toxicology Clinical Research Epidemiology Outcomes Research
PhD Concentrations:	Biostatistics Environmental Management & Policy Environmental Research Industrial Hygiene Epidemiology Health Education/Health Promotion
DrPH Concentrations:	Environmental Health International Health Health Care Organization Maternal and Child Health
Degree Offered:	MPH, MSPH, MS, DrPH, PhD
Phone:	(205) 934-4993
E-mail:	**soph@uab.edu**
Website:	**www.soph.uab.edu**

In addition to the M.S. in Biostatistics, and the Ph.D. programs in Biostatistics, Environmental Health Sciences, Epidemiology, and Health Behavior (Health Education/Health Promotion) that are described in this catalog, several professional degree programs are offered through the School of Public Health. The Master of Public Health (M.P.H.) degree programs are Biostatistics, Environmental Health/Toxicology, Industrial Hygiene, Occupational Health and Safety, Industrial Hygiene/Hazardous Substance, Epidemiology, International Health and Global Studies, Health Behavior, Health Care Organization and Policy, General Theory and Practice, Health Policy, Public Health Preparedness Management, Maternal & Child Health Advanced Leadership, and Maternal & Child Health Enhanced Skills. In addition, several joint degree programs are available that enable students to pursue two degrees simultaneously. These are the M.P.H.-M.D., M.P.H.-D.V.M. (Auburn), M.P.H.-Ph.D. (Psychology or Sociology at UAB), M.P.H.-M.B.A., M.P.H.-M.P.A., M.P.H.-J.D., M.P.H.-O.D., M.S.P.H.-Ph.D. (Psychology at UAB or the University of Alabama), M.P.H.-M.S.W., M.P.H.-M.S.N. The Master of Science in Public Health (M.S.P.H.) includes degree programs in

Clinical Research, Environmental Health Toxicology, Epidemiology, and Outcomes Research. The Doctor of Public Health (Dr.P.H.) degree program options are Environmental Health, International Health, Health Care Organization, and Maternal and Child Health.

Additional Information

Deadline for Entry Term (s):	The deadline for submission of an application for admission for the MPH and MSPH degree programs in the School of Public Health is **April 1**. The application deadline for DrPH degree programs vary by department. **PhD and MS degree application deadlines**
Deadline for all Application Materials to be in the Graduate School Office:	**Master's students** (MPH and MSPH) should plan to begin studies only in the fall semester of each year. Some programs allow spring admission. **Doctoral students** (DrPH) may apply for admission anytime but are strongly encouraged to matriculate in the fall.
Entrance Test:	**Master's Degree Programs** **Doctoral Degree Programs**
Number of Evaluation Forms Required:	Three
School of Public Health Catalog:	**School Catalog**

For detailed information about the M.P.H., M.S.P.H., and Dr.P.H. programs, please consult the School of Public Health web site at **http://www.soph.uab.edu/** or visit the UAB School of Public Health, Ryals Public Health Building, Room 130, 1665 University Boulevard, Birmingham, AL 35294-0022.

Telephone 205-934-4993

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Biostatistics (Ph.D., M.S., M.P.H.)

Degree Offered:	M.P.H., M.S., M.S.P.H., Ph.D.
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Faculty

Inmaculada (Chichi) Aban, PhD (Bowling Green State), Assistant Professor. Clinical Trials, Model Diagnostics, Survival and Reliability Analysis, Inference for Heavy Tail Distributions.

David B. Allison, PhD (Hofstra), Professor and Head of the Section on Statistical Genetics. Statistical Genetics, Meta Analysis, Analysis of Clinical Trials Data, Applied Survival Analysis.

J. Jackson Barnette, PhD (Ohio State), Professor and Senior Associate Dean for the Office of Student and Academic Affairs. Effect Size Indices and Association, Error Control Procedures, Likert Survey Design, Technology in Teaching Statistics.

Alfred A. Bartolucci, PhD (SUNY - Buffalo), Professor. Clinical Trials, Survival Analysis, Bayesian Statistics, Longitudinal Data Analysis.

T. Mark Beasley, PhD (Southern Illinois - Carbondale), Associate Professor. Linear Models, Linkage and Association with Quantitative Traits, Nonparametric Methods, Microarray Analysis.

Christopher S. Coffey, PhD (North Carolina - Chapel Hill), Associate Professor and Director of Graduate Studies. Linear Models, Power Analyses, Adaptive Designs, Sample Size Re-estimation.

Stacey S. Cofield, PhD (Virginia Commonwealth), Assistant Professor. Mixed-Effects Models, Statistical Methods for Microarray Data, Clinical Trials, Statistical Consulting.

Xiangqin Cui, PhD (Iowa State), Research Assistant Professor). Microarray Analysis, Quantitative Trait Locus Analysis.

Gary Cutter, PhD (U. Texas Medical Center - Houston), Professor and Head of the Section on Research Methods and Clinical Trials. Clinical Trials and Community Studies, Chronic Disease Epidemiology, Large Scale Data Bases, Multiple Sclerosis, Neonatal Trials, Behavioral Studies.

Rui Feng, PhD (Yale), Assistant Professor. Genetic Linkage Analysis, Microarrays, Longitudinal Data Analysis.

Jose Fernandez, PhD (Pennsylvania State), Assistant Professor. Statistical Genetics, Admixture Modeling, Obesity.

Naomi Fineberg, PhD (Boston University), Research Professor. Small Medical Studies, Consulting.

Guimin Gao, PhD (Sun Yat-sen University), Research Assistant Professor.

George Howard, DrPH (North Carolina - Chapel Hill), Professor and Chair. Design and Analysis of Multi-center Clinical Trials, Linear Models.

Charles R. Katholi, PhD (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.

Ann E. Loraine, PhD (California - Berkeley), Assistant Professor. Bioinformatics and Computational Biology, Genomic Data Visualization, Data-Mining and Management of Biological Databases, Genome-Based Analysis of Expression Microarray Data.

Nianjun Liu, PhD (Yale), Assistant Professor. Genetic Linkage and Association Analysis, Disequilibrium Mapping, Population Genetics, Bioinformatics, Machine Learning Methods, Longitudinal Data Analysis.

Leslie A. McClure, PhD (Michigan), Assistant Professor. Clinical Trials with Multiple Outcomes, Interim Analysis.

Solomon K. Musani, Ph.D. (Guelph, Ontario). Instructor. Genetic Linkage and Association Analysis, Disequilibrium Mapping, Population Genetics, Animal Models of Genetics.

Grier Page, PhD (Texas Health Science Center - Houston), Assistant Professor. Microarrays, Proteomics, Bioinformatics, Meta-Analysis.

Sharina D. Person, PhD (UAB), Assistant Professor. Time Series Analysis, Epidemiology, Missing Data.

Suzanne Perumean-Chaney, PhD (SUNY - Albany), Research Assistant Professor. Missing Data, Spatial Analysis, Hierarchical Linear Models.

David T. Redden, PhD (Alabama), Associate Professor. Regression Diagnostics, Admixture, Association Studies.

David L. Roth, PhD (Kansas), Research Professor. Structural Equations Modeling, Psychometric Analysis, Longitudinal Growth Curve Analysis.

Ella Temple, PhD (Alabama), Research Assistant Professor. Nonparametric Statistics, Survey Research Methodology, Cardiovascular Disease Epidemiology, Data Collection, Psychosocial Outcomes.

Hemant K. Tiwari, PhD (Notre Dame), Associate Professor. Genetic Linkage and Association Analysis, Haplotype Analysis, Disequilibrium Mapping, Population Genetics, Molecular Evolution, Bioinformatics.

O. Dale Williams, PhD (North Carolina - Chapel Hill), Professor. Public Health Education, Cardiovascular Disease Epidemiology, Clinical Trials.

Nengjun Yi, PhD (Zhejiang), Assistant Professor. Statistical Genetics/Genomics, Bayesian Statistics, MCMC Algorithms.

Kui Zhang, PhD (Peking), Research Assistant Professor. Statistical Methods for Molecular Biology and Genetics, Linkage and Disequilibrium Analysis, Functional Genomics.

General Information

The Department of Biostatistics at the University of Alabama at Birmingham (UAB) 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 graduate program in biostatistics was created to be a balanced program covering both theoretical and applied aspects of biostatistics. As such, the main objectives of the programs are to provide students with an in-depth understanding of statistical theory and methodology, to train them to become effective statistical consultants and collaborators in scientific research, and to train them to do teaching and independent statistical research.

The MPH and MSPH degrees are offered through the School of Public Health. These are school-wide degrees allowing a concentration in biostatistics rather than being degrees in biostatistics per se. For example, the MSPH in Clinical Studies is intended to provide researchers already having a medical degree with the statistical and epidemiological background required to work effectively as members of interdisciplinary teams conducting modern clinical research.

The MS and PhD degrees are offered through the Graduate School. Students entering these programs are expected to have a strong foundation in mathematics. At the very minimum, they should have had a semester of Advanced Calculus, a semester of Advanced Matrix Algebra, and they should be proficient in computer programming skills.

The department has over 29 faculty members and 37 staff. Research includes investigations in diverse areas such as latent variable models to adjust for unobserved confounders in statistical analysis, statistical methods for genetic admixture mapping, microarray data analysis, QTL analysis in experimental crosses, understanding the cause of the excess stroke mortality in the southeastern US, and advancing techniques to determine the number of patients needed in randomized clinical trials using data from nested pilot studies.

The MPH Program

The MPH degree is intended primarily for those who are interested in graduate studies in Public Health with emphasis in biostatistical methodology. These can include persons who are from decision-making positions in health care settings, as well as persons interested in data management, statistical analysis and interpretation, and clinical investigators.

The MPH is a professional degree that includes coursework in all areas of Public Health, and emphasizes the application of statistical models in biomedical and public health settings.

For all MPH degrees, the School of Public Health utilizes an integrated core curriculum in which there are no separate core courses offered by different disciplines. Under this format, there is a single 9 credit hour core course taught in the fall semester and a single 6 credit hour core course taught in the spring. The approach is problem oriented and the course is

taught in modules with each discipline discussing the applications problems from its own point of view in conjunction with the others. There is no way for a student to take the core materials as several separate courses from the different public health disciplines.

Required Courses: MPH in Biostatistics

SOPH Core:	MCH 610	Introduction to Public Health	3 Credit hours
	EPI 600	Introduction to Epidemiology	3 Credit hours
	OR		
	EPI 610	Principles of Epidemiology Research	4 Credit hours
	HB 600	Social and Behavioral Sciences Core	3 Credit hours
	ENH 600	Fundamentals of Environmental Health Sciences	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 624 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

All MPH students must register for a minimum of 3 credit hours of BST 697, spent in an internship situation. The exact nature of the internship will differ from student to student. It may consist of time spent away from the department in a sponsoring institution such as the Centers for Disease Control in Atlanta or the Jefferson County Health Department. Alternatively, the student might work for a coordinating center on campus, with the Biostatistical Unit at the Comprehensive Cancer Center, or elsewhere within the SOPH on grant-sponsored research. Whichever is the case, the student will have an advisor or mentor within the biostatistics department and a supervisor at the internship location. In some cases, this might be the same individual. There must be agreement among the student, the faculty member, and the on-site supervisor regarding the duties that the student will be asked to perform during the internship period. Such experience may require any or all of the following: working with a research team, participating in study design, participating in form design, planning and implementing data entry and database management procedures, implementation of quality control procedures, data analysis, generation of presentation

graphics, and a write-up to describe data analyses. It will be important for each student to stay in touch with their advisor and the Graduate Program Director during this period even if the location is not at UAB.

A written summary of these activities must be presented to the faculty advisor, the Graduate Program Director, and the on-site supervisor following the completion of the internship. This allows a grade to be produced for the internship hours (Pass or Fail) and documents the internship for CEPH, which is the accrediting group for the SOPH. The project summary should contain a description of the project and the role that the student played. The format will vary from student to student, but should reflect a thoughtful, careful report of the internship activities written in good English.

The MSPH Program

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 (CREP), environmental health (CREH), and health behavior (CRHB). 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

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. Scores of 550 or better on each of the three sections of the general test (verbal, quantitative, and analytical writing) are preferred. 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 Biostatistics, Epidemiology, Environmental Health, or Health Behavior, and take at least 9 hours of directed (699 level) Masters research to fulfill the MSPH requirement for conducting a research project.

Coursework		**Credit Hours**
Required Core Courses		**14**
BST 611*	Biostatistics I	3
BST 612*	Biostatistics II	3
EPI 607	Epidemiology of Clinical Research	3
BST 625	Design and Conduct of Clinical Trials	3
EPI 680	Topics in Clinical Research (P/NP)	2
Masters Research Electives †		**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
EPI 625/625L	Quantitative Methods in Epidemiology	5
EPI 626 & 627	Introduction to SAS (2 hours)	
OR		2 or 3
BST 626/626L	Data Management/Reporting with SAS (3 hours)	
EPI 703	Special Topics in the Epidemiology of Chronic Disease (This course focuses on writing proposals for funding)	3
EPI 709	Theoretical Basis of Epidemiology	3
HB 678	Advanced Theory and Practice in Behavioral Science	3
HCO 677	Patient-Based Outcomes Measurement	3
ENH 650	Essentials of Environmental and Occupational Toxicology and Diseases	5
Focus Specific Electives		**9**
9 hours of electives in field of study (selected by faculty advisor and student). With approval of the 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.		
Masters Projfect Research		**9**
9 hours of directed research in a clinical setting BST 699, EPI 699, HB 699, or ENH 699		

* Students who want to focus their degree on Biostatistics should take BST621/622 rather than BST611/612 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 BST621/622 for BST611/612.

† 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.

The MS Program

The Department of Biostatistics offers an MS degree in biostatistics. This program provides a balance between theory and application, the perspective being the role of statistics and modeling in scientific research. The objective is to produce research-oriented scientists who can advance statistical and modeling theory and can interact effectively with scientists in other disciplines to advance knowledge in those fields. For admission to the MS program, a student's undergraduate curriculum must include a complete calculus sequence, linear matrix algebra, and proficiency in computing. It is preferred that students have additional advanced mathematics courses, e.g., differential equations, advanced calculus including special functions, and complex analysis. Some background in the natural sciences would be helpful. Interested students should contact the department of Biostatistics.

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	3 Credit hours
	BST 632	Statistical Theory II	3 Credit hours
	BST 655	Categorical Data Analysis	3 Credit hours
	BST 690	Biostatistical Consulting	0 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 PhD, it is a good idea to take more advanced biostatistics courses as electives.

Outside Electives: A minimum of 6 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.

The departmental handbook and/or the Graduate School Catalog should be consulted for information regarding research advisor, comprehensive examinations, thesis and dissertation proposal and defense.

The PhD Program

The Department of Biostatistics offers a PhD degree in biostatistics. This program provides a balance between theory and application, the perspective being the role of statistics and modeling in scientific research. The objective is to produce research-oriented scientists who can advance statistical and modeling theory and can interact effectively with scientists in other disciplines to advance knowledge in those fields. For admission to the program, a student's undergraduate curriculum must include a complete calculus sequence, linear matrix algebra, and proficiency in computing. It is preferred that students have additional advanced mathematics courses, e.g., differential equations, advanced calculus including special functions, and complex analysis. Advanced calculus and a prior MS in statistics or biostatistics are required for admission to the PhD program. Some background in the natural sciences would be helpful. Interested students should contact the department of Biostatistics.

Required Courses: PhD in Biostatistics

All students entering the PhD program must complete 33 credit hours of regular course work and the consulting course required for the MS degree. In addition to this MS course work, PhD students are required to take the following courses:

Biostatistics Core:	*BST 723*	*Theory of Linear Models*	*3 Credit hours*
	BST 726	*Advanced Computational Methods*	*3 Credit hours*
	BST 735	*Advanced Inference*	*3 Credit hours*
	BST 760	*Generalized Linear and Mixed Models*	*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.

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.

The departmental handbook and/or the Graduate School Catalog should be consulted for information regarding research advisor, comprehensive examinations, thesis and dissertation proposal and defense.

Admission

Students in the Graduate program are admitted in the Fall semester of each academic year. Applicants for the MS/PhD program are expected to have a strong foundation in Mathematics. At the very minimum, they should have had a semester of Advanced Calculus and a semester of Advanced Matrix Algebra, and they should be able to demonstrate

proficiency in programming skills. The MPH applicants should also be quantitatively oriented with background in calculus and linear algebra.

Admission requirements include 550 or better on each of the three sections (verbal, quantitative and analytic) of the GRE General Test and a GPA 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

Fellowships, Traineeships, and/or Assistantships are awarded to well-qualified students, and continued contingent on satisfactory progress toward the degree. Should a student fail to meet the academic standards of the Department of Biostatistics or the Graduate School, he/she forfeits the award. Appeals and grievances should be directed to the Graduate Program Director. (See the UAB Graduate Student Handbook for other grievance procedures.)

A research assistantship entails 20 hours of work a week on the average. No student should be devoting more time to this at the expense of his/her studies. Faculties in other departments sometimes support the research assistantships, and students are expected to perform professionally and to account for their time to the faculty member overseeing the work. A student is expected to fulfill all of the duties assigned in a timely and professional manner at all times.

A student on Fellowship is required to take 12 credit hours of coursework during the regular semesters and 6 credit hours during the summer semester.

MS/PhD Examinations

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, and his/her potential for conducting independent research in statistical methods. 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.

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 either part of the exam at either level, one additional chance will be given to retake the part of the exam that was failed. The MS degree requirements include passing this exam at least at the Masters level. A full time student must pass this examination at the PhD level within the first two years of study in order to continue in the PhD program.

Please note that receipt of an “A” in all individual courses may not constitute adequate preparation for this exam. The purpose of the qualifying exam is to test your ability to connect the information across courses, to choose appropriate analysis methods, and to display a working knowledge of the tools used in probability and inference.

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 statistics. That means 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 committee may approve unconditionally, approve conditionally, or disapprove the proposal. All but no more than one member must approve the proposal. The oral presentation also represents the oral doctoral 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 disapproved, 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.

Upon approval of the dissertation proposal by the dissertation committee, the student must file an “Admission to Candidacy” form with the Graduate School. It is at this point that the student is officially admitted to candidacy for the PhD degree. For this form to be signed, you must have (1) passed the qualifying exam at the doctoral level, (2) written a formal dissertation proposal, and (3) had your dissertation proposal approved by your PhD committee. Continuation of candidacy status is dependent on continued satisfactory evaluation of the student by the faculty and the Dean. You must be registered for at least 3 hours in the semester in which you present your project proposal to your committee and are “admitted to candidacy”.

The dissertation research must include an original contribution to the body of knowledge in statistics and should be of sufficient quality to be published in the statistical literature. The dissertation may be arranged in either the standard format or the three paper model. Under the standard format, the body of the dissertation should include the following components:

1) Introduction and statement of the research problem
2) Literature review
3) Presentation of research results
4) Example of application of results to biomedical data
5) Conclusions and outline of future research on the topic

If a student chooses to use the alternative three paper model, sections (3) and (4) above should be replaced with three papers of sufficient quality to be submitted to statistical journals.

Computer programs and the listing of large data sets used in the dissertation should be put in appendices. Care must be taken to fully document all computer programs used in the dissertation.

PhD Final Exam

After the student has completed all formal requirements for the PhD degree, the dissertation committee administers the final oral examination. 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. The dissertation committee will evaluate the student's performance in the final exam. All but no more than one member 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. It is the responsibility of the student to schedule the defense convenient to all parties involved.

You must be registered for at least 3 hours of Dissertation Research (BST 799) during the semester in which you expect to graduate. When you are nearing completion of your research, you must file an "Application for Degree" with the Graduate School. This must be done by the appropriate date for the semester in which you expect to graduate. Note that the wise student obtains the printed rules for dissertation formats from the Graduate School as soon as he/she begins to write and sticks closely to them. This will save everyone much time and frustration at the end of the process.

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:
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Web site: **www.soph.uab.edu/default.aspx?id=9**

Course Descriptions

Unless otherwise noted, all courses are of 3 credit hours. Courses in italics are only proposals.

BST 600. Biostatistics for Public Health. To provide non-biostatistics students with the ability to understand and utilize basic biostatistical concepts and tools and to facilitate their capacity to seek and utilize biostatistical expertise as may be required when conducting their own research or reviewing that done by others. This course is required for most MPH degree program students. 4 hours.

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

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

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., PC-SAS. Exposure to other software packages as time permits. Prerequisites: BST 600; Previous computer experience or workshop on microcomputers highly recommended. 3hours.

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.

BST 621/622. Statistical Methods I and II.- 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 and multiple linear regression; analysis of variance; use of contrasts and multiple comparisons procedures; introduction to survival analysis; simple and multiple logistic regression. Prerequisites: A year of calculus sequence for BST 621 and BST 621 for BST 622. 3 hours each.

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.

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: BST 623. 3 hours.

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.

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. 3 hours. Concurrent registration in BST 626 and BST 626L is required.

BST 631 & 632. Statistical Theory I & II. Fundamentals of probability; independence; distribution and density functions; random variables; moments and moment generating functions; discrete and continuous distributions; exponential families, marginal and conditional distributions; transformation and change of variables; convergence concepts, sampling distributions. Point and interval estimation; hypothesis and significance testing; sufficiency and completeness; ancillary statistics; maximum likelihood and moment estimators; asymptotic properties of estimators and tests; introduction to Bayesian inference. Prerequisite: Advanced Calculus for BST 631 and BST 631 for BST 632. 3 hours each.

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.

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 612 or equivalent recommended. 3 hours.

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.

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.

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, parametric survival 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.

BST 671. Meta Analysis. Statistical methods and inference through meta analysis. Prerequisite: BST 623, BST 632. 3 hours.

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 622. 3 hours

BST 676. Statistical Bioinformatics.- This class will teach graduate students the algorithms and methods that underlie the analysis of high dimensional biological data, as well as issues in the design and implementation of such studies. High dimensional biology includes micro arrays, proteomic, genomic, protein structure, biochemical system theory and phylogenetic methods. Prerequisites: Some knowledge of statistics (MTH 180 or BST 621) also some bioinformatics/high dimensional biology training (CS 640, MIC 753, or BST 675), is required. Interested students are urged to contact the instructors with concerns regarding assumed knowledge. 3 hours.

BST 690. Biostatistical Consulting. Implementation of statistical theory and application in scientific research. Systematic formulation of problem; data collection procedures; design of study; analysis of data; interpretation and communication of results. Pass/No Pass. 0 hours.

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. 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 loglinear models. Prerequisite: BST 632. 3 hours.

BST 725. Advanced Clinical Trials I.- Students will develop a basic understanding of the fundamental statistical principles involved in the design and conduct of clinical trials. Prerequisites: BST 611, 612 and 625. 3 hours.

BST 726. Advanced Clinical Trials II.- Students will develop a more thorough understanding of the basic methodology behind important statistical concepts used in the design and analysis of large, randomized clinical trials. Prerequisites: BST 621, 622, 625, 631, 632 and 725. 3 hours

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 723. 3 hours.

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

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

BST 760. Generalized Linear and Mixed Models. Generalized linear models; mixed models; and generalized estimating equations. Prerequisite: BST 723. 3 hours

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.

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.

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.

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. 1-3 hours.

BST 798. Non-dissertation Research. Pass/No Pass. 1-6 hours.

BST 799. Dissertation Research. Prerequisite: Admission to candidacy for PhD. Pass/No Pass. 1-12 hours.

Environmental Health Sciences (Ph.D.)

Degree Offered:	Ph.D.
Director:	*Bailey*
Phone:	205-934-7070
E-mail:	**sbailey@uab.edu**
Web site:	**http://www.soph.uab.edu/default.aspx?id=15**

Faculty

Shannon M. Bailey , Associate Profess or and Program Director, Molecular Mechanisms of Chronic Alcohol and Obesity Induced Liver Diseases; Mitochondrial Dysfunction in Disease; Molecular Bioenergetics; Functional Proteomics; Free Radical Biology

Carol Ballinger, Research Instruct or, Environmental Toxicants and Free Radical Biology

Steven M. Becker, Associate Professor and Vice Chair, Environmental Management and Policy; Disaster Preparedness and Response; Chemical/Biological/Radiological/Nuclear Incidents; Terrorism and Public Health Preparedness; Psychosocial Aspects of Radiation; Risk Perception; Crisis and Emergency Risk Communication.

Dale A. Dickinson, Assistant Professor, 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

Jeannette E. Doeller, Research Associate Professor, Protective Role of Hydrogen Sulfide in Metabolic, Vascular and Hepatic Physiology; Real-Time Measurements of Hydrogen Sulfide in Conjunction with Functional Assays of Intact Tissues, Cells, and Isolated Mitochondria

Michelle V. Fanucchi, Associate Professor - Childhood lung disease and its etiology; Pulmonary cell biology and toxicology of air pollutants, including particulates, ozone, and various polyaromatic hydrocarbons; Cell-to-cell interactions in the developing lung as well as in repair after lung injury and disease in children.

Mark D. Garfinkel, Research Assistant Professor, Environmental Toxicology; Drosophila Developmental Biology, Genetics and Epigenetics; Computational Genomics; Nutrigenomics

Rui-Ming Liu, Associate Professor, Oxidative Stress/Antioxidants in Lung Fibrotic and Neurodegenerative Diseases; Glutathione Metabolism during Aging and Age-Related Diseases

Claudiu Lungu, Assistant Professor, 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, Assistant Professor, Reduction of Work-Related Injuries and Illnesses Through Effective Training; Expanding the Capacity of Environmental Public Health Practitioners in Working Within Communities to Address Environmental Health Problems; Prevention of Workplace Violence.

Melissa W. Norman, Assistant Professor, Noise-Induced Hearing Loss; Evaluation of Hearing Conservation Program Effectiveness; Relationship Between Noise Exposure and Non-Auditory Effects; Relationship Between Hearing Loss and Chemical Exposures; Development of Training Methods to Improve Hearing Protection Device Compliance

R. Kent Oestenstad, Associate Professor; Aerosol Science; Exposure Assessment; Noise and Hearing Loss; Respiratory Protection

Edward M. Postlethwait, Professor and Chair, Pulmonary Toxicology and Free Radical Biochemistry

Giuseppe L. Squadrito, Research Associate Professor, Free Radical Chemistry and Biochemistry, Analytical Chemistry, Thermodynamics and Kinetics of Chemical Reactions; Oxidants and Antioxidants; Smoke, Smog, and Combustion Products

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, and Environmental Disasters and Environmental Management.

The objectives of the program leading to a PhD in Environmental Health Sciences are to prepare students for scientific careers in academia, industry, government, and non-governmental organizations. A combination of didactic, laboratory experience, and/or field-based training will be provided to achieve the specific goals for each student. This degree is granted on the basis of distinctive academic achievement, scholarly proficiency, and original research. The Department offers training in three areas of concentration: (1) Basic Science of Environmental Toxicology, (2) Environmental Management and Policy, and (3) Industrial Hygiene/Occupational Safety.

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 nationally-recognized Integrative Biomedical Sciences (IBS) program during their first year of study. The IBS 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 IBS program, providing students with the opportunity to grow academically and professionally with a diverse network of faculty. More information on the IBS program can be found at:
http://peir.path.uab.edu/ibiosci/cat_index_29.shtml

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. Individuals interested in the Environmental Management and Policy concentration should have a Masters degree in an appropriate health, environmental or related field; or significant relevant professional experience. 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 combined score of at least 1100 on the verbal and quantitative sections is required; consideration will also be given to performance on the analytical section. Deadline for applications to be admitted into the program is May 1, although basic science applicants are encouraged to apply no later than March 1.

Curriculum

PhD students are expected to complete the department course requirements as well as those courses necessary to prepare them to conduct their dissertation research. The department's PhD program offers training in three areas of concentration: (1) Basic Science of Environmental Toxicology; (2) Environmental Management and Policy; and (3) Industrial Hygiene/Occupational Health and the curriculum requirements can be found **here**.

Additional Information

Deadline for Entry Term(s):	May 1
Deadline for All Application Materials to be in the Graduate School Office:	February 1
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=24889**

For detailed information, contact Ms. Cherie Hunt, 1665 University Boulevard, University of Alabama at Birmingham, School of Public Health, Room 530, Birmingham, Alabama 35294-0022.

Telephone 205-934-8488

E-mail **ehs@crl.soph.uab.edu**

Course Descriptions

Environmental Health Sciences (ENH)

700. **Scientific Basis of Environmental Health**. Environmental problems encountered by public health professionals, including water pollution, water resources, air pollution, industrial hygiene and occupational safety, and toxicology. Case studies used in examining environmental problems.

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.

702. **Advanced Topics in Environmental Management**. Course will combine lectures, case study discussions, and special topic presentations by students to apply principles and methods of environmental management. Instruction will feature case studies for assessments under the Toxic Substance Control Act (TSCA), the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Non- indigenous species and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Students will receive instruction on planning processes and structuring of interdisciplinary teams, and will demonstrate their independent and comprehensive understanding of environmental management tools (advisory, economic and regulatory).

705. **Special Topics (Readings) in Environmental and Occupational Health**. Topics taught on request on individual basis: radiological health, air pollution, systems safety, advanced toxicology, toxicokinetics, environmental science related to risk assessment process.

710. **Grant Proposal Writing in the Biomedical Sciences.** Introduction to writing grant proposals and fellowship applications. Topics include scientific ethics, funding sources, electronic databases, organization and format of proposals and applications, submission and review processes, use of secondary sources, and guidelines for effective proposal writing.

711. **Risk Assessment of Environmental Hazards.** Principles of risk assessment and management as applied to various environmental issues. Examination of theoretical aspects of epidemiology, toxicology, and environmental science related to risk assessment process.

720. **Integrated Biomedical Science for Environmental Health I.** The purpose of this course is to provide students with a rigorous background in the principles of biological chemistry and cellular physiology. Students should master and include the application of these principles to research protocols and performance. The knowledge acquired can then be applied to organ-system physiology, pathophysiology, pharmacology, and genomics in ENH 721 and ENH 722. (Course is scheduled with IBS 700).

721. **Integrated Biomedical Science for Environmental Health II.** The purpose of this course is to integrate the anatomic, physiologic, pathophysiologic and pharmacologic principles of molecular, cellular, whole tissue and organ physiology. The material mastered in this course builds upon the basic principles learned in ENH 720 and will facilitate the understanding of cellular and whole-organism physiology and the role of the breakdown of these processes in human disease . (Course is scheduled with IBS 701).

722. **Integrated Biomedical Science for Environmental Health III.** The purpose of this course is to integrate the anatomic, physiologic, pathophysiologic and pharmacologic principles of molecular, cellular, whole tissue and organ biology. The material mastered in this course builds upon the principles learned in ENH 720 and 721 and will facilitate understanding in genetic-based disorders and genetically generated animal models of disease provided in this course. (Course is scheduled with IBS 702).

763. **Aerosol Technology**. Properties and behavior of aerosols from industrial hygiene and environmental perspectives. Fundamental particle descriptions and critical fluid properties affecting particle behavior. Methods of defining particle size and size distribution and theories of particle kinetics and their application to particle deposition and collection. Prerequisite: ENH 661-662.

764. **Signal Transduction in Environmental Health and Toxicology**. One of the major challenges in environmental health is determination of the underlying mechanisms through which toxicants act. Many of the adverse effects of toxicants are mediated through interaction with the processes whereby tissues and cells communicate with each other or respond to external stimuli. Some toxicants may interfere with normal signaling while others may mimic endogenous stimulants and mediators. Another major mechanism for the action of toxicants is the stimulation of inflammatory processes.

770. **Advanced Topics in Environmental Disasters and Public Health**. This course 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. Students engage in an advanced in-class group exercise based on a realistic disaster or emergency scenario. Prerequisite: Successful completion of ENH 610: Environmental Disasters or the equivalent

780. **Seminars in Free Radical Biology and Medicine.** The purpose of this course is to provide a forum in which students are directly exposed to the most recent findings in free radical biology and medicine from national and international experts in these fields. Students will be expected to become comfortable asking questions in scientific setting.

781. **Journal Club: Mechanisms of Redox Cell Signaling and Disease.** The purpose of this course is to provide a forum in which students become comfortable critically reviewing recent refereed publications in the fields of redox cell signaling, physiology and pathology. Students will also be expected to become comfortable answering and asking questions in a scientific setting. Prerequisite: Permission of instructor.

782**. Free Radical Chemistry and Biochemistry.** This course will use chemical and biochemical principles to thoroughly understand how free radical species mechanistically function in vivo. This course is designed for doctoral students admitted to campus-wide PhD programs in the biomedical and basic sciences with research interests in free radical

chemistry, biology and medicine. Prerequisite: successful completion of the IBS or CMB first year program; co-registering in ENH 783 is strongly encouraged. Offered January/February.

783. **Free Radicals in Health and Disease.** The primary focus of this course will be a critical examination of how free radical species mechanistically function to promote human health or contribute to disease, and will build on the material taught in ENH 782. Emphasis will be placed on debunking some common beliefs found in the lay and scientific communities that are not supported by rigorous scientific research. Prerequisite: successful completion of the IBS or CMB first year program and completion of ENH 782. Offered March/April.

790. **Seminar: Current Topics in Environmental Health Sciences Research**. Interactive forum in which students and faculty discuss topics related to the field of Environmental Health Science research through student presentations of dissertation research and relevant scientific journal articles. This course is designed to develop oral communication and presentation skills needed for presenting scientific material to peers. Presentations by graduate students are followed by discussion and questions. Prerequisite: Permission of Instructor.

791. **Advanced Environmental Health and Toxicology Seminar**. This seminar course will expose students to diversified subjects and cutting edge research from national and international experts in Environmental Health Sciences. Prerequisite: Permission of Instructor.

796. **Environmental Health Sciences Research Rotation**. First year PhD candidates in Environmental Health Sciences are required to complete at least three mentored-research rotations approved by the PhD/DrPH Program Director.

798. **Doctoral-Level Directed Research**. Independent study with guidance of appropriate faculty mentor. Pass/No Pass. Prerequisite: Permission of PhD/DrPH Program Director.

799. **Dissertation Research**. Prerequisite: Admission to candidacy.

Epidemiology (Ph.D.)

Degree Offered:	Ph.D.
Director:	*McGwin*
Phone:	(205) 325-8117 or 975-3036
E-mail:	**mcgwin@uab.edu**
Web site:	**www.soph.uab.edu/default.aspx?id=16**

Faculty

Donna Arnett, Professor (Epidemiology); Cardiovascular Genetic Epidemiology, Pharmacogenetics

Brahim Aissani, Assistant Professor (Epidemiology); Genetic Epidemiology ; Infectious Disease Epidemiology

Eric Chamot, Assistant Professor (Epidemiology); Infectious Disease Epidemiology, Screening, International Health

Hong Cheng, Assistant Professor (Epidemiology); Occupational Epidemiology, Epidemiologic Methods

Philip Cole, Professor Emeritus (Epidemiology); Cancer Epidemiology, Epidemiologic Methods, Ethics, History of Public Health

Elizabeth Delzell, Professor (Epidemiology); Occupational Epidemiology, Chronic Disease Epidemiology Including Cancer

Rodney Go, Professor (Epidemiology); Population Genetics, Chronic Disease Epidemiology, Molecular Epidemiology

Virginia Howard, Assistant Professor (Epidemiology); Cardiovascular Disease Epidemiology

Pauline Jolly, Professor (Epidemiology); Infectious Disease Epidemiology, International Health

Edmond Kabagambe, Assistant Professor (Epidemiology); Nutritional Epidemiology, Chronic Disease Epidemiology

Richard Kaslow, Professor (Epidemiology); Infectious Disease Epidemiology, Immunogenetics

Mirjam-Colette Kempf, Assistant Professor (Epidemiology); Infectious Disease Epidemiology

Sibylle Kristensen, Assistant Professor (Epidemiology); Infectious Disease Epidemiology, Maternal and Child Health

H. Michael Maetz, Professor Emeritus (Epidemiology); Infectious Disease Epidemiology, Surveillance, Bioterrorism

Gerald McGwin, Associate Professor (Epidemiology); Injury Epidemiology, Ophthalmic Epidemiology; Epidemiologic Methods

Rodney Perry, Assistant Professor (Epidemiology); Molecular Epidemiology

Jeffrey Roseman, Professor Emeritus (Epidemiology); Chronic Disease Epidemiology Including Diabetes and Heart Disease; Injury Epidemiology

Nalini Sathiakumar, Associate Professor (Epidemiology); Occupational Epidemiology, Chronic Disease Epidemiology

Sadeep Shrestha, Assistant Professor (Epidemiology); Infectious Disease Epidemiology, Genetic Epidemiology

Jenifer Voeks, Assistant Professor (Epidemiology); Chronic Disease Epidemiology

John Waterbor, Associate Professor (Epidemiology); Chronic Disease Epidemiology, Cancer Control

Program Information

Admission Requirements

Applicants to the Ph.D. program in epidemiology must have earned a Master of Public Health degree or the equivalent, with a strong background in epidemiology and statistics.

Curriculum

One biostatistics course, three epidemiologic methods courses, two specialty courses, three doctoral seminars, one teaching practicum, and one outside elective are required (in addition to several master's level courses if they were not taken while earning an M.P.H.).

Additional Information

Deadline for Entry Term(s):	Fall semester
Deadline for All Application Materials to be in the Graduate School Office:	April 1 for Fall enrollment; February 1 to be considered for financial aid Fall semester
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=24890**

For detailed information, contact Dr. Gerald McGwin, EFH 609, 1530 3rd Avenue South, Birmingham, AL 35294-0009.

Telephone 205-325-8117 or 205-975-3036

Fax 205-325-8692

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

Course Descriptions

For additional courses in epidemiology and other public health areas, see the catalog of the School of Public Health. 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.

Epidemiology (EPI)

703. **Special Topics in the Epidemiology of Chronic Disease.** To provide the student with information about grant writing and practice in preparing a grant proposal for submission. The proposal must relate to an epidemiologic topic. Human subjects issues are discussed. (Faculty)

705. **The Epidemiology of Cardiovascular Disease.** An exploration of the breadth and depth of the epidemiology of cardiovascular disease including history, classification, surveillance, frequency, distribution, etiology, natural history, and control. It will also address the programmatic details of large-scale epidemiologic studies in cardiovascular disease and discuss in detail CVD epidemiologic papers relating to the use of various study designs. Prerequisite: EPI602 or permission of instructor. (Howard/Canto)

709. **Theoretical Basis of Epidemiology**. Statistical concepts underlying analysis of epidemiologic studies; interrelationship of epidemiologic measures; principles and analysis of matched study designs and of standardized ratio measures. Computer simulations and class presentations. Prerequisites: EPI625. (Funkhouser)

710. **The Analysis of Case-control Studies**. This course is designed to provide doctoral students in epidemiology with the theoretical basis of and practical experience in the analysis and interpretation of data from case-control studies. Prerequisites: BST603, BST655, EPI709. (Barbone)

711. **Nosocomial Disease Control Practicum.** Exposure to and involvement in hospital infection control. Student assigned to infection control practitioner at a

local hospital. Project required. Prerequisites: Permission of instructor, EPI610 and EPI605. (Maetz)

712. **Infectious Disease Epidemiology Practicum.** On-site exposure to epidemiology as applied in health department setting with emphasis on infectious disease control. Project required. Prerequisites: Permission of instructor, EPI610 and EPI605. 2 credit hours. (Maetz)

720. **The Analysis of Follow-up Studies.** Designed to provide doctoral students in epidemiology with the theretical basis of and practical experience in the analysis and interpretation of data from follow-up studies. Prerequisite: EPI710. (McGwin)

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. Prerequisite: Permission of instructor. (Go)

740. **Cancer Epidemiology.** Methodologic and substantive issues in cancer epidemiology. The course will consist of a series of lectures by the instructors and other faculty and of a series of presentations by students. Prerequisites: EPI625. 2 credit hours (Delzell)

788. **Principles and Methods in Molecular Epidemiology**. Molecular biology and its relevance to the epidemiology of human diseases, and the ability to apply this new molecular knowledge to epidemiologic research. The course will develop knowledge and skills in molecular biology and genetics, and demonstrate ways to apply this information in evaluating susceptibility, etiology, symptomatology, treatment, and eventual prevention of diseases. 4 credit hours. (Go)

790. **Doctoral Seminar in Epidemiology.** In depth study of several areas of epidemiologic methodology. Students responsible for selecting and presenting topics. Considerable reading and outside preparation required. Prerequisite: Permission of instructor. 2 hours. (Faculty)

797. **Analysis and Presentation of Epidemiologic Data.** To gain experience with the analysis, interpretation, and presentation of epidemiologic data by successfully analyzing a data set and presenting the results in the form of a publication quality manuscript. Restricted to PhD students in Epidemiology. Prerequisites: BST 655 and EPI625. 2 credit hours (Funkhouser/McGwin)

798. **Doctoral-Level Directed Research, Epidemiology.** Independent study with guidance of appropriate public health faculty. 1-6 hours.

799. **Dissertation Research, Epidemiology.** Research for dissertation under direction of dissertation committee. 1-6 hours.

Health Education/Health Promotion (Ph.D.)

*The program leading to the Ph.D. in Health Education/Health Promotion is offered jointly by the UAB School of Education (SOE), UAB School of Public Health (SOPH), and the University of Alabama (Tuscaloosa) College of Human Environmental Sciences, Department of Health Science (UA).

Degree Offered:	Ph.D.*
Director (School of Public Health, Department of Health Behavior):	*Connie Kohler*
Phone:	(205) 934-6020
E-mail:	**ckohler@uab.edu**
Web site:	**www.soph.uab.edu/healthbehavior**

Degree Offered:	Ph.D.*
Director (School of Education, Department of Health Education):	*David Macrina*
Phone:	(205) 934-2446
E-mail:	**dmacrina@uab.edu**
Web site:	**www.ed.uab.edu/healtheducation**

Degree Offered:	Ph.D.*
Director (College of Human Environmental Sciences, Department of Health Science):	*Stuart Usdan*
Phone:	(205) 348-8373
E-mail:	**susdan@ches.uab.edu**
Web site:	**http://130.160.212.112/health/PhD/**

Faculty

Wajih Ahmad, Assistant Professor, SOE, Health Education

Monica L. Baskin, Assistant Professor, SOPH, Health Behavior

John Bolland, Associate Professor, SOPH, Health Behavior

Huey Chen, Professor, SOPH, Health Behavior

Susan Davies, Associate Professor, SOPH, Health Behavior

Retta Evans, Associate Professor; SOE, Health Education

H. Russ Foushee, Adjunct Professor, SOPH, Health Behavior

Melissa Galvin, Associate Professor, SOPH, Health Behavior

Brian F. Geiger, Associate Professor, SOE, Health Education

Diane M. Grimley, Associate Professor, SOPH, Health Behavior

Connie Kohler, Associate Professor, SOPH, Health Behavior

Brad Lian, Assistant Professor, SOPH, Health Behavior

David M. Macrina, Professor, SOE, Health Promotion, Community Health, Planning and Administration

Mike Perko, Adjunct Professor, UA, Health Science

Cynthia J. Petri, Associate Professor, SOE, T Theory, Community Health Education

Jalie Tucker, Professor, SOPH, Health Behavior

Lori Turner, Adjunct Professor, UA Health Science

Stuart Usdan, Adjunct Professor; UA, Health Science

Additional Information

Deadline for Entry Term(s):	Fall semester
Deadline for All Application Materials to be in the Graduate School Office:	February 1
Number of Evaluation Forms Required:	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)
Comments	Information for students enrolling in the School of Public Health is available from Ms. Julie Brown, M.S (**jebrown@uab.edu**, phone 205-975-8075, fax 205-934-9325).

For more information, contact:

Health Education/Health Promotion Graduate Program Director (Education): David M. Macrina, Ph.D.

dmacrina@uab.edu

Health Education/Health Promotion Graduate Program Director (Public Health): Diane Grimley, Ph.D.

ckohler@uab.edu

Health Education/Health Promotion Graduate Program Director (Health Science): Stuart Usdan, PhD.

susdan@ches.ua.edu

Health Education and Health Promotion (Ph.D.)

The Ph.D. program in Health Education/Health Promotion has been designed to provide students with the academic and practical experience to become leading practitioners and researchers in health education and health promotion. The program combines the resources of academic units from the University of Alabama at Birmingham (School of Education and School of Public Health) and the University of Alabama (Tuscaloosa--College of Human Environmental Sciences).

Admission to Ph.D. program

Student applications are reviewed by a joint admissions committee composed of members of the participating academic units. 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 bachelor's or master's degree from an accredited institution in health education or a health-related field.

Program of Study

The Ph.D. 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. The requirements for the Ph.D. degree through the School of Public Health is a minimum of 67 credit hours: 43 hours of coursework, 12 hours of research internship and 12 hours of dissertation research.

Students entering the program with a master's degree may transfer appropriate coursework to this program, but 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 their advisor.

The specific components of the Ph.D. program in health Education and Health Promotion are outlined below.

Ph.D. through the School of Education

I. Health Education and Promotion Courses

(UA = HHE, UAB-Public Health = HB, UAB-Education = HE)

A. Advanced Theoretical and Scientific Bases of Health Education and Health Promotion (HHE 605, HB 750, HE 705)	3 hrs
B. Health Communications Research (HHE 607, HB 730, HE 701)	3 hrs
C. Planning and Administration of Health Education and	

Health Promotion (HHE 606, HB 760, HE 710)	3 hrs
D. Doctoral Studies Seminar (HHE 604, HB 770, HE 692a)	3 hrs
	12 hrs
II. Advanced Research and Statistical Methods	
A. Multivariate/Multiple Regression Analysis	3 hrs
B. Advanced Epidemiological Research Methods	3 hrs
C. Data Management/Computer Technology	3 hrs
D. Evaluation/Research Methods	3 hrs
	12 hrs
III. Coursework in the Social and Behavioral Sciences Minor	**12 hrs**
IV. Research Internship	**12 hrs**
V. Dissertation	**24 hrs**
	Total: 72 hrs

Ph.D. through the School of Public Health

I. Health Education and Promotion Courses	
(UA = HHE, UAB-Public Health = HB, UAB-Education = HE)	
A. Advanced Theoretical and Scientific Bases of Health Education and Health Promotion (HHE 605, HB 750, HE 705)	3 hrs
B. Health Communications Research (HHE 607, HB 730, HE 701)	3 hrs
C. Planning and Administration of Health Education and Health Promotion (HHE 606, HB 760, HE 710)	3 hrs
D. Doctoral Studies Seminar (HHE 604, HB 770, HE 692a)	3 hrs
	12 hrs
II. Advanced Research and Statistical Methods	
A. Advanced Epidemiological Research Methods	4 hrs
B. Data Management / Computer Technology	3 hrs
C. Intermediate Statistical AnalysisI/ Statistical Methods	3 hrs
D. Advanced Health Program Evaluation	3 hrs
E. Intermediate Statistical Analysis II/ Statistical Methods and Research in Education: Intermediate	3 hrs
	16 hrs
III. Program Evaluation/Research Methods/Statistics Electives	**6 hrs**
IV. Social and Behavioral Sciences Electives	**9 hrs**

V. Research Internship **12 hrs**

VI. Dissertation Research **12 hrs**

Total: 67 hrs

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

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. Course will be graded by letter. 3 hours

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.- 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. Prerequisite: HB 750. 3 hours

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 graded by letter. Prerequisite: HB 643 or other master's level evaluation course and a graduate level multiple regression or multivariate statistics course. Course will be graded by letter.

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.

Health Education (HE)

502. **Mental Health and Stress Management**. Fundamental concepts of mental health and mental illness, with emphasis on etiology, symptomology, treatment, and prevention of mental illness. Elementary skills, dynamics of stress, and contemporary methods of stress management.

508. **Drug Use and Abuse**. Emphasis on emotional, intellectual, psychological, and social aspects of drug use. Misconceptions about drugs. Attitudes toward drugs and drug prevention and treatment programs.

521. **Health Communication**. Skills appropriate for selected health problems; problem solving and referrals.

523. **Human Sexuality**. Biological, sociological, and cultural aspects of sexuality.

531. **Planning and Evaluation**. Program planning and curriculum development for school, agency, and health care settings. Need assessment, objective setting, methodology, and evaluation are emphasized.

532. **Administration of Health and Fitness Programs**. Administrative theory applied to health and fitness settings.

593. **Educational Gerontology**. Program preparation for generic consumers. Major health concerns facing many senior citizens and ways to communicate educational interventions. Prerequisite: Permission of instructor.

598. **Issues in Women's Health**. Historical and psychosocial factors that have and may continue to influence the potential health status of the American female. Major causes of morbidity and mortality as well as tips for health care system utilization.

601. **Current Readings in Health Education**. Review of literature in health education. Development of annotated bibliography pertinent to professional practice. Prerequisite: Permission of advisor.

602. **Alcohol and Society Seminar**. Effects of alcohol on individual health, family relations, and community life. Prerequisite: Permission of instructor.

606. **Issues in Disease Control**. Nature and distribution of disease; communicable and nutritional diseases of childhood; possibilities for prevention. Prerequisite: HE 223 or permission of instructor.

610. **Foundations of Health Education**. Issues in health education; school, community, or patient health education. Prerequisite: Permission of instructor.

611. **School Health Programs**. National, state, and local factors influencing school health programs; influences of official and nonofficial agencies. Historical perspective, present and future directions of profession and school health. Prerequisites: HE 342, 343, 431, and 489.

612. **Workshop in Health**. Concepts and methods to increase proficiency. Comprehensive health education K-6 or 7-12; health education in school, community, or both. 3 to 6 hours.

640. **Content Issues I .** 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.

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.

642. **Health Behavior and Health Education**. Students will examine multiple methods that are used in professional health education practice. Course content will include consideration of the nature of effective helping relationships. Prerequisite: HE 610.

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.

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.

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.

693. **Advanced Field Experience**. Professional practice and research supervised by qualified health education professionals in approved health education work setting. 3 or 6 hours.

695. **Junior/Secondary Health Education**. Student teaching. Prerequisite: HE 610, 689, and other courses identified by advisor. 9 hours.

698. **Nonthesis Research**. 1-6 hours.

699. **Thesis Research**. Supervised research project. Prerequisite: Admission to candidacy and permission of advisor. 1, 2, 3, or 6 hours.

700. **Seminar in Health Education**. Presentation of health education research.

701. **Special Topic 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.

702. **Supervised Research in Health**. Research problem based on school, community, or public health education needs. Prerequisite: Permission of advisor. 3 or 6 hours.

703. **Advanced Field Experience**. Professional practice and research supervised by qualified health education professionals in approved health education work setting. 3 or 6 hours.

705. **Advanced Theoretical and Scientific Basis of He**alth. Analysis of knowledge, attitude and behavior change strategies, and resulting effect on health status.

710. **Planning and Administration of Health Education/Health Promotion Programs**. Case study of school and community health education interventions. Decision making and development of program planning skills in designing interventions in a variety of health education settings.

720. **Evaluation of Health Education Programs**. Evaluation protocols in health education settings; needs assessments, process and formative evaluations, cost benefits, summary reports.

729. **Ed.S. Thesis Research**. Prerequisite: Admission to candidacy.

730. **Evaluation Research Methods**. Theory and application of behavioral evaluation research including preparation of research NIH type proposals.

731. **Health Education Planning and Promotion**.

732. **Evaluation of Health Education Programs**.

740. **Evaluation of Health Education Programs**.

* 798. **Nondissertation Research**.

* 799. **Dissertation Research**. Prerequisite: Admission to candidacy.

SOCIAL AND BEHAVIORAL 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/**

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

Degree Offered:	M.A.*
Director:	*Kyle*
Phone:	(205) 934-3508
E-mail:	**kyle@uab.edu**
Web site:	**www.sbs.uab.edu/Depts/Anthro/Anthropology/Anthrohome.html**

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

Christopher C. Taylor, Professor; Symbolic Anthropology, Medical Anthropology, Ethnohistory, Africa

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) archeology - 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 seminar in Research Methodology (ANTH 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 semester 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 three-hour 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 student must take the comprehensive exams before 20 credit hours of course work are completed. 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. A student should present a research project plan to the committee before twenty hours of course work have been completed. 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 and oral 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 15
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. Chris Kyle, Graduate Program Director, UAB Department of Anthropology, U 338, 1530 3rd Avenue South, Birmingham, Alabama 35294-3350.

Telephone 205-934-3508

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

Web **www.sbs.uab.edu/Depts/Anthro/Anthropology/Anthrohome.html**

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)

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.

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**.

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

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)

619. **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)

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.

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

Degree Offered:	M.S.C.J.
Director:	*Morgan*
Phone:	(205) 934-2069
E-mail:	**kmorgan@uab.edu**
Web site:	**www.uab.edu/criminaljustice**

Faculty

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

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

Tomislav V. Kovandzic , Associate Professor (Justice Sciences); Inequality and Crime; Firearms and Violence; Research Methods; Criminal Justice Policy; Police

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

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

Lynne M. Vieraitis , Assistant Professor (Justice Sciences); Criminological Theory; Gender Inequality and Crime; Labor Markets and Crime; Violence Against Women

Adjunct Faculty

Robert Berry ,Police Administration; Criminal Justice Policy

Foster Cook ,Research Professor (Psychiatry); Drugs and Crime; Addiction; Program Evaluation

Mark LaGory ,Professor (Sociology); Urban Sociology; Demography; Violence

Charles Lindquist , Associate Professor (Emeritus); Corrections; Comparative Criminal Justice Systems; Intentional Injury; Criminal Justice Policy

James Philips ,Criminal Law, Evidence, and Procedure; White Collar and Corporate Crime

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 May 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. Students failing to meet the minimum requirements for admission, but who are reasonably close, **may** be admitted to the M.S.C.J. program "on probation." Students admitted on probation will be given the opportunity to establish and maintain a minimum GPA of 3.0 for all graduate coursework undertaken. Failing to do so will result in dismissal from the program.

Degree Requirements

Plan I (Thesis)

Students selecting the Plan I option must (1) complete a minimum of 30 semester hours (24 of which are the required professional seminars JS 600, 601, 602, 604, 605, and 606) and (2) propose and then complete a major research project under the direction of a thesis committee chaired by the student's major advisor. 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 (Nonthesis)

Students selecting the Plan II option must (1) complete a minimum of 36 semester hours in coursework, 24 hours of which consist of the required professional seminars and (2) write a 20-25 page "research paper" in their area of substantive interest. The research paper must combine material covered in theory, research methods, data analysis, and social policy classes. This research paper is done under the guidance of the student's advisor. The student will enroll in a minimum of 6 credit hours of course work to satisfy this requirement. The student will prepare and submit this reserach 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.

White Collar and Corporate Crime Specialization

In conjunction with the M.B.A. program in the School of Business, students in the M.S.C.J. program may pursue a specialization in the investigation and prosecution of white collar and corporate offenders. Students choosing this specialization will take 15-18 elective hours in coursework. Information on the White Collar and Corporate Crime specialization is available from the M.S.C.J. Program Director.

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:	May 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. Kay Morgan, Department of Justice Sciences, University Boulevard Office Building (UBOB) room 210, 1530 3rd Avenue South, Birmingham, Alabama 35294-4562.

Telephone: 205-934-2069

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

Web **www.uab.edu/criminaljustice**

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

600. **Proseminar 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. **Nature of Crime**. Analysis of crime patterns and known correlates; theoretical explanations of criminality including classical, biophysiological, psychological, and sociological theories.

602. **Seminar in Criminological Theory**. Classic and contemporary structural explanations of crime; substantive focus on relationships between crime and cultural and institutional arrangements.

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

605. **Seminar in Criminal Justice Research Methods**. 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 Criminal Justice 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**. Analysis of illegal or deviant behavior occurring in organizational settings, including crimes committed by and against complex organizations.

541. **Terrorism and Social Control**. Analysis of the causes and consequences of terrorism; substantive focus on government response including investigation, prosecution, and punishment of terrorists.

542. **Race, Crime, and Justice**. An examination of how the subordinate status of minority groups (primarily African Americans, Hispanics, and Native Americans) affects their interaction with the justice system.

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

544. **Law and Society**. Origins and definition of law; overview of legal systems and their characteristics; use of law to facilitate or retard social control, social change, and social conflict.

545. **Juvenile Corrections**. Analysis of ongoing efforts to reduce juvenile delinquency; particular attention paid to recent innovations, programs, and program effectiveness.

580 **Patterns of Crime.** Analysis of the social correlates of crime and the typologies of offenders.

607. **Seminar in Criminal Justice Planning**. Planning and integration of programs in criminal justice system; techniques and tools used by planners.

608. **Seminar in Current Issues in Law Enforcement**. Analysis of such issues as administration, police-community relations, corruption, and design of law enforcement agencies.

609. **Seminar in Juvenile Delinquency**. History, measurement, patterns, and theories relating to delinquent behavior.

610. **Seminar in Correctional Systems**. Correctional philosophy; legal decisions, correctional programs, research, treatment approaches, and decision-making processes.

612. **Seminar in Comparative Criminal Justice Administration**. Theories, philosophies, and techniques of criminal justice systems worldwide; evaluation of governmental role in administration of justice systems.

613. **Seminar in Law and Society**. Classical and modern perspectives on the nature, origins, and functions of law.

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

620. **Investigation and Prosecution of White Collar Crime**. Analyses of legal aspects of case preparation and presentation; legal theories of individual and collective criminal responsibility; trial strategies

676. **Law, Evidence, and Procedure**. 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.

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/criminaljustice**

Faculty

Steve Drexler, Instructor; Conventional Criminalistics

Elizabeth Gardner, Assistant Professor

Jay Glass, Instructor; Questioned Death Investigation

Michael Jackson, Instructor (Justice Sciences); Computer Forensics

Jason Linville, Teaching Assistant Professor, Director

James Phillips, Adjunct Instructor; Law, Evidence, and Procedure

Mitch Rector, Instructor; Conventional Criminalistics

Anthony Skjellum, 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. Students may also pursue a certificate in forensic accounting, offered in conjunction with the Department of Accounting and Information Systems.

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, 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.

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 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.)
Comments	None

For detailed information, contact **Dr. Jason G. Linville**, UAB Department of Justice Sciences, University Boulevard Office Building (UBOB) room 210, 1530 3rd Avenue South, Birmingham, Alabama 35294-4562.

Telephone 205-934-2069

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

Course Descriptions

All forensic science courses have a Justice Sciences (JS) prefix. 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.

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.

572. **Biology for Forensic Scientists**. Discussion of molecular biology and recombinant DNA technologies, including DNA/RNA, genes/genetic expression, cloning, DNA extraction, and PCR amplification.

650. **Advanced Questioned-Death Investigation**. Examination of forensic pathology as used in/applied by local medical examiners' offices.

652. **Advanced Questioned Document**. Discussion of the use of thin layer chromatography and advanced instrumentation in the analysis of paper, ink, and typewriters/printers; includes handwriting analysis.

653. **Advanced Investigation of Fires and Explosives**. Examination of the collection, preservation, and analysis of accelerants; discussion of GC/MS analysis.

656. **Advanced Forensic Approaches to Osteology**. Overview of the study of human remains as applied to forensic science. Collection and analysis of bones, including determination of age, sex, and race of subject.

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. **Topics in Forensic Science: 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. **Topics in Forensic Science: 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 pharmacokinic and pharmacodynamic properties of detected substances.

678. **Topics in Forensic Science: Capillary Electrophoresis**. Examination of the principles, methods, and current issues in the forensic application of capillary electrophoresis.

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 Science (Non-thesis)**. Forensic science problems, issues, and theories. May be repeated for credit. 1-6 hours.

682. **Directed Research in Forensic Science (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:	*Conley*
Phone:	(205) 934-5634
E-mail:	**cconley@uab.edu**
Web site:	**www.uab.edu/history**

Faculty

Carolyn A. Conley, Professor (History); British and Irish Political and Social History; History of Violence

Colin J. Davis, Professor (History); U.S. Labor, Women's Labor History, Social History.

Harriet E. Amos Doss, Associate Professor (History); U.S. Middle Period, Antebellum South, U.S. Social History

Virginia V. Hamilton, Professor and University Scholar Emerita (History); Twentieth-Century U.S., The South Since Reconstruction

Horace Huntley, Assistant Professor (History); African American History

Andrew W. Keitt, Associate Professor (History); Early Modern Europe, European Cultural and Intellectual, Iberian World

Daniel R. Lesnick, Associate Professor (History); Medieval History, Renaissance and Reformation, Italy

George O. Liber, Professor (History); Soviet, Post-Soviet, Russian, Eastern European, and Ukraine

Michael N. McConnell, Associate Professor (History); Colonial North America, American Revolution, American Indian

Tennant S. McWilliams, Professor (History); Recent South, Modern United States, U.S. Foreign Affairs

Andre J. Millard, Professor (History); History of Technology, Economic and U.S. Cultural History

Stephen Miller, Assistant Professor (History); France; Economic History

Raymond A. Mohl, Professor (History); U.S., Urban, Social, Ethnic, and Historiography

Pamela S. Murray, Associate Professor (History); Latin America, National Period, Colombia

John van Sant, Associate Professor (History); Asian History

Brian Steele, Assistant Professor (History); Jefferson-Jackson, U.S. Social, Intellectual History

James F. Tent, Professor, University Scholar, and Chairman (History); Modern European History; Germany, Military History, Cold War

Samuel L. Webb, Associate Professor (History); New South, Alabama, Legal and Constitutional History

Secondary Faculty

Robert Corley; Director (Global and Community Leader Honors Program); Modern South, History of Birmingham

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 includes more course work.

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. Carolyn Conley, History Graduate Program Director, Department of History, U402, 1530 3rd Avenue South, Birmingham, Alabama 35294-3350.

Telephone 205-934-5634

E-mail **cconley@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.

615. **Seminar in American Myths, American Values**. Recommended for students teaching at the secondary-education level and for traditional history students alike. Examines the major myths that inform, and that are informed by, traditional American values and how both shape social relationships.

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 Medieval Europe**. Survey of the Middle Ages focusing on society, religion, and culture from 500-1500.

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.

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.

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.

771. **Special Projects in History**. Prerequisite: Open only to those who hold the M.A. degree. 1-3 hours.

Psychology (Ph.D.)

Director of Behavioral Neuroscience Specialization: *Randich*

Director of Developmental Psychology Specialization: *Ball*

Director of Medical/Clinical Psychology Specialization (APA Approved): *Milby*

Primary Faculty

Franklin R. Amthor, Professor (Psychology): Neurophysiology of Vision

Kirstin Bailey, Research Assistant Professor (Psychology)

Karlene Ball, Professor (Psychology); Cognitive Science; Aging

Fred J. Biasini, Research Assistant Professor (Psychology); Mental Retardation, Developmental Disabilities

Paul D. Blanton, Research Associate Professor (Psychology)

Mary Boggiano, Associate Professor (Psychology); Behavioral Neuroscience, Eating Disorders

Edwin W. Cook III, Associate Professor (Psychology); Clinical Psychology, Health Psychology, Anxiety Disorders

James E. Cox, Associate Professor (Psychology); Physiological Psychology, Obesity

Elizabeth M. Griffith, Research Assistant Professor (Psychology)

Askhari J. Hodari, Assistant Professor (Psychology)

Bart Hodgens, Assistant Professor (Pediatrics); Clinical Psychology, Adolescent Medicine

Carl E. McFarland, Jr., Professor and Chair (Psychology); Cognitive and Developmental Psychology

Jesse B. Milby, Professor (Psychology); Clinical Psychology, Medical Psychology, Behavior Therapy, Addiction Treatment & Outcome

Sylvie Mrug, Research Assistant Professor (Psychology); Adolescents' Peer Relationships, ADHD

Eun Young Mun; Developmental Psychopathology

Diana Paulk, Research Assistant Professor (Psychology)

Alan Randich, Professor (Psychology); Experimental Psychology

Christopher Robinson, Teaching Associate Professor (Psychology)

David C. Schwebel, Associate Professor (Psychology); Clinical Child Psychology

Michael E. Sloane, Associate Professor (Psychology); Visual Perception and Psychophysics

Edward Taub, University Professor (Psychology); Medical Psychology, Biofeedback

Diane C. Tucker, Professor (Psychology); Clinical Psychology, Physiological Psychology, Psycho-oncology and Genetic Testing

Gitendra Uswatte, Assistant Professor (Psychology)

Rudy E. Vuchinich, Professor (Psychology); Alcoholism Outcome, Behavioral Economics

Jan Wallander, Professor (Psychology); Clinical Child Psychology

Amanda Walley, Associate Professor (Psychology); Development of Speech and Language

Rosalyn E. Weller, Associate Professor (Psychology); Neuroscience, Visual Perception, Brain Imaging

Rex A. Wright, Professor (Psychology); Social Psychology

Areas of Specialization

The Psychology Graduate Program offers three specialization options to doctoral students: Behavioral Neuroscience, 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, neurophysiology, neuroanatomy, neuropharmacology, neurochemistry, and molecular biology. The research interests of the faculty include neuroanatomy and neurophysiology of the visual system; psychophysics; interactions between the central nervous system and the periphery in the control of feeding and energy balance; neurophysiology of motor systems and movement disorders; chemical senses; neurochemical and immunological approaches to the study of acetylcholine receptors in brain and muscle; neurochemistry and neuroanatomy of disorders of movement; models of memory dysfunction; development precursors of nerve-target interactions;

hypertension; structure-activity relationships of hallucinogens; psychiatric disease; and the neurochemistry and neurophysiology of pain.

Developmental Psychology

The 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, Center for the Advancement of Youth Health, the Center for Aging, the Center for Applied Gerontology, the Comprehensive Youth Violence Center, 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: mental retardation and developmental disabilities (with special interests in prenatal development and exposures, early intervention, improving special education, adolescent psychosocial development and mental health, and how family members adapt to the problems of a handicapped child); 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); 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, caregiving in families of elderly persons, human factor issues in vision and aging); and language and communication disorders (with special interest in the development of speech perception and word segmentation in young children, how word segmentation may relate to beginning reading, and developmental changes in abilities to use computer-assisted communication systems).

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 provides scientist-practitioner training in clinical psychology with an emphasis on investigation and service delivery in a medical setting, oriented toward the prevention and treatment of medical disorders and the enhancement of health. This program of study 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 Neurosurgery and Cardiovascular Surgery), and Medicine (including the Divisions of General and Preventive Medicine, Rheumatology, Arthritis, and Gastroenterology), the Center for Aging, the Sparks Center for Developmental and Learning Disorders, the Civitan International Research Center; the VA Medical Center, and the 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; cardiology--hypertension; cardiovascular surgery--open-heart surgery outcome; pediatric virology--congenital infections and mental development; gastroenterology--irritable bowel syndrome and rumination; anorexia-bulimia program; head injury center--rehabilitation, neurovascular surgery research; cocaine and other drug dependence--treatment, development and evaluation; very low birth-weight project; pain clinic intervention program; mental retardation--Down's syndrome parent coping project, Alzheimer's disease diagnosis and caregiver projects; and neuropsychological evaluations of epilepsy surgery; 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 Psychology program faculty research is extramurally funded by private foundations and federal support, especially the Center 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 specialization director and the UAB School of Public Health.

Application

The deadline for receipt of a complete application for admission is **January 15 (November 30 for Medical/Clinical Psychology Program)** preceding the beginning of the program in September. 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. 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 Developmental Psychology specialization requires undergraduate work in psychology, biology, and mathematics. Students without undergraduate coursework in these areas may be required to take additional coursework after enrollment.

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 Developmental Psychology specialization will be assigned an advisor by the Developmental Psychology specialization director. The advisor may be changed upon request of the student and agreement of the Developmental Psychology Specialization director.

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

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.

Each student in the 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 lifespan developmental psychology sequence, including an overview course (PY 708), an adolescent developmental course (PY 729), and an aging course (PY 785). An additional 12 hours in general developmental psychology is required from a range of course options (PY 711-715, PY 726-728, PY 758, PY 783). Developmental psychology students are also required to complete two terms of teaching practicum (PY 796), and a four-course sequence in statistics and research design (PY 716, 717, 719, 725). Additional requirements include at least 8 credit hours of electives in courses such as social psychology, theories of emotion, psychological tests and measurement, introduction to neurobiology, geriatric and gerontology interdisciplinary core curriculum, and reading (theoretical foundations).

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.

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 and humoral

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 or be approved by the Medical/Clinical Psychology Coordinating Committee. The PhD is awarded upon successful defense of a dissertation and completion of internship.

Financial Aid

All students admitted to the Behavioral Neuroscience, Cognitive Science, 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. Alan Randich, Behavioral Neuroscience Specialization Director; Telephone 205-934-3850; Email **arandich@uab.edu**;

Dr. Karlene Ball, Developmental Psychology Specialization Director; Telephone 205-934-2610; Email **devpsy@uab.edu**;

Dr. Jesse Milby, Medical/Clinical Psychology Specialization Director; Telephone 205-934-8723; **medpsych@uab.edu**; Web **http://www.uab.edu/psychology/**

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.

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 in children.

712. **Seminar in Social Development**. Theoretical models and empirical findings.

713. **Seminar in Language Development**. Research and theory related to normal and deviant language development.

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**. Probability, descriptive statistics, sampling distributions, null hypothesis testing, comparisons between means; tests on categorical data, bivariate and multiple regression.

717. **Applied Statistical Methods**. Univariate analysis of variance and factorial designs; interpretation of data from multifactor experimental designs. 4 hours.

718. **Research Design**. Traditional and nontraditional approaches; includes univariate and multifactor experimental designs, quasi-experimental designs.

719. **Multivariate Statistical Methods**. Multiple regression, multivariate analysis of variance and covariance, canonical correlation, principal components, and discriminant analysis. 4 hours.

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 Meth**odology. 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 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 I**. Prevention, enhancement, and intervention; environmental factors, marketplace factors, and interpersonal factors.

732. **Health Psychology II**. Physiological and psychological factors influencing disease and disorders; health psychological assessment and intervention strategies applicable to individuals and groups.

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. **Child and Adolescent Psychopathology**. Development of aberrant behavior beginning in infancy through adolescence, including GAP and DSM III; categorization schemes and relationship to developmental outcome. 2 hours.

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:V

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.

Cognitive Science (CGS)

700. **Foundations of Cognitive Science**. An introduction to the interdisciplinary study of mind and intelligence, embracing philosophy, psychology, computer science, neuroscience, and linguistics; past and future of cognitive science; key concepts and methods.

702-708. **Special Topics**. Mind/brain; brain mapping and functional imaging; formal languages and neural nets; language development and cross-cultural language studies; select current topics in cognitive science.

710. **Proseminar Journal Club in Cognitive Science**. Pass/Fail. 1 hour.

712-720. **Research Rotation**. Cognitive science research as practiced by participating cognitive science faculty. Pass/Fail. 1-3 hours each.

The following departments or programs offer courses available to and recommended for cognitive science graduate students. Further information may be obtained by contacting the Committee on Graduate Study in Cognitive Science.

Anthropology (ANTH)
Biocommunication (BIC)
Biomedical Engineering (BME)
Computer and Information Sciences (CS)
English (Linguistics) (EH)
Neuroscience (NEUR)
Philosophy (PHL)
Psychology (PY)
Physiology and Biophysics (PHY)
Vision Science (VIS)

Public Administration (M.P.A.)

Degree Offered:	M.P.A.
Director:	*Haque*
Phone:	(205) 934-9680
E-mail:	**mpa@uab.edu**
Web site:	**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

Steven H. Haeberle, Associate Professor and Chair (Government): American Government, Urban Politics, Intergovernmental Relations, Research Methods, Advanced Statistics

Jeremy L. Hall , Assistant Professor (Government): Public Policy, Performance Management, State and Local Government; Economic Development; Program Evaluation

Akhlaque U. Haque , Associate Professor (Government): Public Administration Theory, Geographic Information Systems, Information management, technology and governance, health policy.

Michael Howell-Moroney , Assistant Professor (Government); Urban Planning, Microeconomics, Research Methods and Advanced Statistics

James D. Slack , Professor (Government); Human Resource Management, Ethics and Morality, Workplace Diversity Policy, Faith-based Management

Donna M. Handley , Assistant Professor (Government); Public and nonprofit budgeting, nonprofit management, intergovernmental relations, leadership in public administration.

Adjunct Faculty

Christopher Reaves, Ph.D., Project Manager, UAB Center for Urban Affairs (Local Government)

Ellyn Grady, MPA. Senior Vice President, Agency Impact, United Way of Central AL (Nonprofit Management)

Janis Hitchcock, MPA, JD. Grants Manager, UAB. (Administrative Law)

Karen S. McCoy, MPA. Housing Planner, Jefferson County Office of Community and Economic Development (Nonprofit Marketing and Planning)

Ray Morris, MPA. Director of Operations and Information Technology, Regional Planning Commission of Greater Birmingham (Information Technology in the Public Sector)

Raymond Goolsby, MPA. Recruitment Representative, Personnel Board of Jefferson County (Leadership in Public and Nonprofit Sectors)

Sam Gaston, MPA. City Manager, Mountain Brook. (City-County Management)

Vincent Intoccia , Federal EEOC Judge (Public & Administrative Law)

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 MPA faculty, community members, Alumni and students (See recent presentation to the Board regarding **UAB MPA Mission Building Process**).
The MPA curriculum is designed to ensure that students: (1) understand the political, economic, social and legal context of the public service; (2) understand and appreciate the transcending values of ethics/morality and diversity in the public service; (3) achieve substantial competence in (i) policy-making processes; (ii) administrative theory and behavior, (iii) human resource management; (iv) budgeting; (v) research design; (vi) statistical methods; and (vii) information management in the public and nonprofit sector. To accomplish these objectives, students complete an **eight-course core curriculum** that provides a foundation for more specialized coursework as well as long-term development and advancement in public service management and leadership positions. UAB MPA Graduates tend to cluster in three general areas managers, analysts, and policy specialists

Degree Requirements

Students in the MPA program must complete a total of 52 semester hours or the equivalent, with an overall grade average of at least B. Six of those hours are earned in an internship placement, although that requirement may be waived for students who have full-time paid work experience in public or nonprofit agencies. 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. 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 non-traditional students interested in managing non-profit organizations the program offers a **Graduate Certificate in Nonprofit Management.**

Admission Requirements

Because of its multi-disciplinary nature, persons from all undergraduate majors are considered for admission to the program. The program adheres to a standardized admission

score based on candidates GPA and GRE scores for admission. A combined score of 800 or higher (GRE times 100 plus average verbal and quantitative in GRE) is required for full admission. **See admission critieria for details on the combined standardized score: Criteria.** . Candidates may be accepted on probation if the standardized admission score is between 700 and 799. Candidates whose standardized admission score fall between 650 and 699 will need majority of the MPA faculty approval to get admitted to the program on probation. Candidates whose score fall below 650 are not accepted in the program. Three letters of reference are also required to enter the program. Application for admission should be made online through the UAB Graduate School website **http://www.uab.edu/graduate** (UAB, Birmingham, Alabama 35294-1150; telephone 205-934-8227) Admissions will be made fall and spring semester.

Financial Aid

The Department of Government has four graduate assistantships, which can be awarded during any semester as vacancies occur. Graduate assistantships are competitive and awarded on a first-come-first basis according to merit. The MPA program also has a grant from the U.S. Department of Housing and Urban Development (HUD) to provide up to four two-year fellowships based on financial need. In addition, every year at least one MPA student is awarded a cash award for academic excellence from the MPA Alumni Association. Other financial resources are available through the Office of Student Financial Aid.

Curriculum

Core Courses All students are required to take the following eight courses:

MPA 600	Environments of Public Service
MPA 601	The Public Policymaking Process
MPA 602	Administrative Theory and Behavior
MPA 603	Public and Nonprofit Budgeting
MPA 604	Human Resources Management
MPA 605	Information Technology in the Public Sector
MPA 606	Research Design
MPA 607	Statistical Analysis*
MPA 697	Graduate Research Paper (Capstone)**

*Pre-requisite MPA 606 (Research Design)
**Should be taken last term

Students must complete four (4) courses in one of the following specializations: Nonprofit Management, Community Planning and Development, Public Management and Policy, or Generalist. In addition to four specialization courses students in non-thesis option must take three electives. Students taking the thesis option (Plan I) must take two (2) Independent Study (MPA 696, 1 hr and 3 hr) under the guidance of the thesis chair and six thesis hours. For non-thesis option (Plan II) students take three (3) electives and one hour Graduate Research (MPA 697). Total of 46 hrs would be required to complete the program. For pre-career students additional 6 hrs of internship (20 hrs/week) is also required. A full-time student taking nine hrs (3 courses) per semester should spend three to four semesters (2 years) to complete the program. The sequence of course offerings can be found here: **Sequence of Course Offerings.**

Specializations

Students should select a specialization based upon their career goals and interests. The specializations that are available are **Non-Profit Management, Community Planning & Development** and **Public Management & Policy**. There are four specialization requirement courses for each track.

Nonprofit Management

The majority of students who choose this specialization are mid-career and wish to improve their organizational management skills in the nonprofit sector including healthcare management areas.
Specialization requirements (four courses)

MPA 672	Nonprofit Management
MPA 689	Program Evaluation
MPA 678	Strategic Planning
MPA 676	Financial Management in the Nonprofit Sector

Community Planning and Development
Students interested in city management or planning should select this specialization. Relevant positions include policy development and implementation, budget development, public works management, and economic and community development.

Specialization requirements (four courses)

MPA 681	Local Government Planning
MPA 691	Economic Development
MPA 674	Geographic Information Systems
MPA 677	Urban Policy and Administration

Public Management and Policy

Those who plan to work as management, budget, or research policy analysts should choose this specialization. Other relevant professions include planning and development, human resource and productivity enhancement, and program evaluation.

Specialization requirements (four courses)

MPA 662	State and Local Government Administration
MPA 675	Ethics and Morality in Public Service
MPA 683	Public Economics
MPA 668	Intergovernmental Relations

Plus three electives from other specializations or from the following listed courses:

MPA 667	Administrative Law
MPA 671	Marketing and Fundraising
MPA 690	Seminar in Public Service Issues (three separate courses):

1. Administrative Leadership
2. E-Government

3. Faith-based Nonprofit Organization

MPA 695 Special Topics in Public Administration (three separate courses)

1. Grant Writing & Management
2. Decision making using GIS
3. Finding Jobs In PA

MPA 696 Independent Study in Public Administration*

***** *Permission of the Program Director required*

Generalist MPA Degree. An alternative to selecting one of the above specializations exists. 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 three specializations, and one elective course.

Information Management An alternative to selecting one of the above specializations students may pursue an open specialization in Information Management. This specialization should be chosen if the student desires a broader understanding of the information management, technology and e-applications in the public sector and nonprofit sector. Program directors permission is required to enroll in this specialization. To complete the specialization students must take four technology-based specialization courses and three electives.

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 to, and enroll in, both programs, meeting each program's entry requirements.

MPA/MPH PROGRAM REQUIREMENTS

Students are required to complete a total of 55 semester hours for the coordinated degree (includes 6 hours of internship). Core requirements of 18 hrs from the MPA program and 19 hrs from the MPH program is required Students can specialize in the Health Care Policy or Health Care Management track. The full-time students should be able to complete all degree requirements within three years. For more information go to **MPA/MPH program**.

Coordinated MPA/JD Program

The M.P.A. 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. For more information go to **MPA/J.D program**
Students must apply and be admitted to the M.P.A. 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. A thesis is optional.

Graduation Research Paper

During the last semester of study, students opting the non-thesis (Plan II) must register for MPA 697, Graduation Research (1hr), and successfully complete a graduation research paper. Such a paper will require the student to synthesize material learned over the course of the program and apply that to a practical setting (area or agency). Should the student need to rewrite any part of the paper, he/she may be required to enroll again in MPA 697 for the subsequent term. Guidelines for writing the GRP can be found in the following link **GRP Guidelines**

Course Descriptions

Public Administration (MPA)

Unless otherwise noted, all courses are for 3 semester hours of credit.
600. **Environments of Public Service**. Introduction to the environmental forces that shape the nature and direction of the public service. Examination may include philosophical, historical, intellectual, constitutional, social and cultural, and ethical and moral environmental forces. 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. Includes an interactive laboratory format which applies budgeting fundamentals to a hands-on budget experiment. 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. **Managing Information in the Public and Nonprofit Sectors**. Theory and applications of information management in the public and nonprofit sectors. Focus is on social, organizational, political and constitutional impacts of information today. Emphasizes

applications such as database management, website design, E-government applications and geographic information systems. 3 hours.

606. **Research Design**. Quasi-experimental and experimental research design, including exposition of several qualitative and basic quantitative methods. 3 hours.

607. **Statistical Analysis**. Using a pragmatic and applied approach, this course introduces more advanced statistical techniques including simple and multiple regression and techniques to analyze categorical data. 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 hrs.

667. **Public and Administrative 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. **Nonprofit 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 in local nonprofit agencies.

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. **Geographic Information Systems**. Examines the use of Geographic Information Systems (GIS) using GIS software. It integrates theory and socioeconomic applications of GIS in the public and non-profit sector. 3 hours.

675. **Ethics and Morality in Public Service**. Ethical and moral foundations to public service behavior. 3 hours.

676. **Financial Management for Nonprofits**. Emphasis on the financial management systems used in the nonprofit sector. Topics include nonprofit leadership, financial budget analysis, accounting and operations techniques, and fundraising. The application of these concepts to the nonprofit sector is also conducted through group and/or individual projects working with local nonprofit agencies. 3 hours.

677. **Urban Policy and Management**. Examines American urban settings in historical and contemporary contexts. The course includes a broad examination of social forces and policies that affect urban places. 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 and the extent to which there is substantial variation. 3 hours.

681. **Local Government Planning**. Overview of theories, methodologies, and political aspects of municipal planning. 3 hours.

683. **Public Economics**. Application of microeconomic theory to the public sector problems and policy analysis. 3 hours.

689. **Program Evaluation**. Analytic tools for evaluating public and nonprofit programs and services. 3 hours.

690. **Seminar in Public Service Issues**. Special topics focusing on current pressing issues in government and governance, and the non-profit sectors. Students should contact instructors to get details on individual course-topics offered. 3 hours.

691. **Economic Development**. Develops an understanding of the impact of market and non-economic forces on local and regional economic development. 3 hours.

692. **Independent Study in Public Administration**. One-on-one learning experience between student and an instructor with permission of the program director. 3 hours.

693. **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. 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.

697. **Graduation Research**. The thesis or Graduation Research Paper (GRP) is the capstone project for the MPA degree. Every student is required either a thesis or GRP at the end of their course work. **GRP Guidelines.**1 hour.

699. **Thesis Research**. Credit for research and writing of thesis. 1-6 hours.

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. For more information go to **MPA Alumni**

INTERNSHIPS AND PLACEMENT

Students may apply for an internship placement at any time following completion of MPA 600. Several paying opportunities exist, although the majority of internships are non-paying. 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 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.

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
Graduate Catalog Description	**http://main.uab.edu/show.asp?durki=95290**

Contact Information

For additional information refer to the web site of the UAB M.P.A. program: **www.uab.edu/mpa**. Also detailed information can be found in the M.P.A. graduate manual available at the program office. Questions concerning enrollment in the M.P.A. program should be directed to Dr. Akhlaque U. Haque. Director, MPA Program. Department of Government and Public Service. U 238, 1530 3rd Avenue South. Birmingham, Alabama 35294-3350.
Telephone (205) 934-9680 or email: **mpa@uab.edu**

Sociology (M.A.), Medical Sociology (Ph.D.)

Degree Offered:	M.A., Ph.D. in Medical Sociology
Director:	*Drentea*
Phone:	(205) 934-2562
E-mail:	**pdrentea@uab.edu**
Web site:	http://www.sbs.uab.edu/Depts/Soc/SocHome.html

Primary Faculty

Erika Austin, (Sociology); Medical Sociology, Gender and Sexuality, Methods, Statistics

Casey Borch, Assistant Professor (Sociology); Political Sociology, Social Psychology, Quantitative Methods, Medical Sociology

Jeffrey M. Clair, Associate Professor (Sociology); Medical Sociology, Social Psychology, Policy

William C. Cockerham, Professor (Sociology); Medical Sociology, Theory, Mental Health, International Aspects of Health

Shelia R. Cotten, Associate Professor (Sociology); Information and Communication Technologies, Mental Health, Medical Sociology

Patricia Drentea, Associate Professor (Sociology); Family, Gender, Aging, Methods

Harry Hamilton, Teaching Assistant Professor (Sociology); History, Religion, Family

Sean-Shong Hwang, Professor (Sociology); Statistics and Methodology, Demography, Human Ecology and Urban Sociology

Mark E. LaGory, Professor and Chair (Sociology); Urban Ecology, Mental Health,, Homelessness; Theory

Ferris J. Ritchey, Professor (Sociology); Medical Sociology, Statistics, Health Care and Illness among the Homeless

Becky Trigg, Teaching Assistant Professor (Sociology); Deviant Behavior, Family, Sex and Gender

Kenneth L. Wilson, Associate Professor (Sociology); Inequality, Adult Development, Social Psychology

Michele Wilson, Associate Professor (Sociology); Deviant Behavior, Sex Roles, Social Problems, Social Control of Women

Secondary Faculty

Richard M. Allman, Professor (Medicine; Center for Aging); Gerontology, Doctor-Patient Communication
Patricia Sawyer, Assistant Professor (Medicine; Center for Aging); Gerontology

Affiliated Faculty

Janet Bronstein, Professor (Health Care Organization and Policy); Medical Anthropology

Heath Copes, Associate Professor (Justice Sciences); Symbolic Interaction; Deviance and Criminal Identity

Hughes Evans, Associate Professor (Pediatrics); History of Medicine

Michael Flannery, Professor (Lister Hill Library of the Health Sciences); History of Medicine

Lynn Gerald, Associate Professor (Medicine; Lung Health Center)

Harold Kincaid, Professor (Philosophy); Philosophy of Science

Michael Morrisey, Professor (Health Care Organization and Policy); Health Policy

John Sloan, Associate Professor (Justice Sciences); Victimization

Alan Stamm, Professor (Medicine); Geriatric Medicine

Christopher Taylor, Professor (Anthropology); Medical Anthropology

Sociology M.A. Program

Requirements for the M.A. Degree

To be admitted in good standing, candidates must meet all Graduate School admission requirements. 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 students must fulfill the requirements below.

- All of the following core courses are required for all students:

SOC 701	Data Management and Analysis
SOC 703	Advanced Statistics
SOC 705	Methodology of Social Research
or	
SOC 711	Qualitative Methods
SOC 707	Macrosociological Theory

SOC 720	Microsociological Theory
3 continuous semesters of 702, The Proseminar on the Profession.	
Two of the five courses in the medical sociology core	

Plan 1 (Thesis) Option

At least two additional substantive courses (these may be in areas outside of sociology, subject to approval by the Sociology graduate program director);

· 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 research opportunities for graduate students to work with faculty on 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 GPAs 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 3.5 GPA 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 have transferred up to 12 hours of transfer credit that were not used for any other degree program (see graduate school guidelines). We may also waive up to 16 credits for those who come in with a masters.

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.

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 alternative is a longer, traditional thesis organized in the form of a short book monograph. This option is especially appropriate for qualitatively based

research. The second alternative is a manuscript in the standard form of a journal article with appended materials.

Advising

The Graduate Director will provide continuous advisement on academic progress during the student's graduate study, including course selection and research experiences consistent with the student's developing interests and abilities.

Research supervision is provided by faculty whom students select to chair the master's thesis and Ph.D. dissertation committees. Typically, the student will select persons with whom a close, supportive relationship develops.

The placement of Ph.D. students in research sites is an important part of the Medical Sociology Program. Such sites may involve assisting faculty on research grants or working in a clinical setting under the supervision of a faculty member. Such experiences will provide students with invaluable real-life exposure to medical sociology "in action." As such, they are important accompaniments to the in-class coursework of the Ph.D. program.

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 721	Social Psychology of Health and Illness
SOC 735	International Medical Sociology
SOC 781	Sociology of Health
SOC 787	Sociology of Mental Health
SOC 788	Social Medicine

Theory Core (6 hr)
Required:

SOC 707	Macro Sociological Theory

1 of 2 Required:

SOC 720	Micro Sociological Theory
SOC 722	Contemporary Sociological Theory

Statistics and Research Core (12 hr)

SOC 701	Data Management
SOC 703	Advanced Statistics
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/Tranfser Credits (30 hr--21 hours in house, up to 9 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

2. Graduate Proseminar Functions

The graduate proseminar series (SOC 702) is generally attended by all entering graduate students for their initial three terms in the graduate program. This series should not only help students become situated within the graduate program, but it should also give students an opportunity to become better acquainted with much of the faculty and graduate student body. Students should also gain experience in such areas of the sociological profession a creating a curriculum vitae and developing one's own research interests through the facilitation of faculty members and fellow students. Here, students may also develop their own personal biographical statement of interests to be provided to the next graduate student cohort for assimilation and student mentor selection functions. The Department of Sociology is generally fairly flexible in planning and executing the proseminar series, but these classes for the most part familiarize the new students with departmental aspects (faculty, graduate student body) as well as various facets of the profession of sociology as a whole.

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 alternative is a traditional thesis organized in the form of an extensice book monograph. This option is especially appropriate for qualitatively based research.

The second alternative 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 houranl 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 507 and 520) and two core methods courses (SOC 501 and SOC 503, or SOC 505 and SOC 511), completed two of the three 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, and devise a course plan. This committee also will handle the student's admission to candidacy and the comprehensive examination 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. 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.sbs.uab.edu/Depts/Soc/SocHome.html
Graduate Catalog Description	**http://main.uab.edu/show.asp?durki=25096**

For detailed information, contact Patricia Drentea, Sociology Graduate Program Director, UAB Department of Sociology, HH R460, 1401 University Boulevard, Birmingham, Alabama 35294-1152.

Telephone 205-934-2562

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

Web **www.sbs.uab.edu/socio.htm**

Course Descriptions

Unless otherwise noted, all courses are for 3 semester hours of credit.

Sociology (SOC)

701. **Data Management and Analysis**. Codebook design; management of data files; orientation to microcomputer software; bivariate statistical analysis. Prerequisite: SOC 310 or permission of instructor.

702. **Proseminar on the Profession**. Introduction to the profession of sociology. Required for all incoming students. 1 hour.

703. **Advanced Statistics**. Multivariate statistical analysis. Prerequisite: SOC 701 or equivalent or permission of instructor.

704. **Advanced Quantitative Analysis**. Structural equation modeling. Prerequisite: SOC 701 and SOC 703 or permission of instructor.

705. **Quantitative Methods**. Prerequisite: SOC 703 or equivalent.

707. **Macrosociological Theory**. Basic theoretical perspectives, functionalism, conflict theory, structural and biosocial theorizing. Prerequisite: SOC 407 or equivalent.

708. **Integrating Qualitative and Quantitative Method**. Triangulated research strategies.

710. **Multivariate Statistical Methods.** Structural equation modeling in general and LISREL in particular. Builds practical skills and a broad awareness of the rationale for statistical methodologies. Prerequisite: SOC 703 or multiple regression equivalent.

711. **Qualitative Methods**. Gaining access to research settings; ethnographic field strategies; developing and analyzing fieldnotes; 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.

714. **Survey Research Methods**. Survey design, sampling, instrumentation, data collection and analysis, and report writing.

716. **Social Stratification**. Theories of inequality; race and ethnic inequality, gender inequality, and international inequality.

720. **Microsociological Theory**. Society from individual's perspective; interactionist theory, social exchange, sociology of emotions.

721. **The Social Psychology of Health and Illness**. Socially constructed definitions of health and illness, viewed historically and cross-culturally. Variations across gender, class, and ethnic lines in perceptions of health and illness.

722. **Contemporary Sociological Theory**. Reviews most recent sociological theories accounting for social conditions in the 21st century, including Beck, Bourdieu, Foucault, Giddens, and the postmodernists.

725. **Integrating Sociological Ideas.** Through extensive reading and writing, integration of knowledge acquired in theory and methods courses; facilitation of the dissertation proposal. Prerequisite: completion of the M.A. degree, SOC 701, 703, 705, 707, 711, 780, and SOC 720 or 722.

730. **Comparative Family Systems**. Organization and functions; urbanization and family influences on personality.

734. **International Medical Sociology**. Cross-cultural, comparative analysis of health and health care delivery systems in both industrialized and developing countries.

735. **Special Topics in International Medical Sociology**. 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.

755. **Race and Ethnic Relations**. Income inequality, school and residential segregation, intermarriage, and interracial relationships.

756. **Gender Inequality**. Theories of inequality, applicability to gender stratification; macro and micro research.

757. **International Inequality**. Globalization and economic, political, and ecological bases of inequalities between “developed” and “developing" countries. Racial, ethnic, and gender variations in inequality.

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.

769. **Sociology of the Life Cycle**. Theories of life; social construction of age categories, aging and family life, work, careers, and aging; men, women, and life cycle.

770. **Techniques of Population Analysis**. Composition of population; constructing life tables; population estimation and projection; migration.

771. **Sociology of Disability**. Chronic conditions and injuries leading to disability among elderly persons; societal attitudes toward disability; measuring disability and improving quality of life for older disabled people.

772. **Medical Demography**. Quantitative assessment of health status of populations in clinical, epidemiological, and sociological studies; interrelationships of health with population structure and dynamics. Modeling preventive health strategies.

774. **The Sociology of Policy Analysis**. Theories of policy formation and implementation, social impact analysis, implementation analysis; role of sociology in policy process.

775. **Urban Ecology**. Population distributions and spatial patterns in cities, effects on behavior.

777. **Demography of Health and Aging**. Focus on demographic processes, such as mortality, morbidity, migration, and fertility; how each influences number and proportion of elderly; how such processes shape age-sex structure; other demographic characteristics of older people.

778. **Demography**. Effect of population processes such as birth, death, migration, and marriage on growth, decline, composition, and distribution of populations.

779. **Experiencing Urban Life**. Experiences of persons in cities; major theories of urban life, meanings of community, social organization of daily city life, urban lifestyles, power in cities.

780. **Medical Sociology**. Theory and research in medical sociology; systematic overview of relevant literature.

781. **Sociology of Health**. Subjective experience of illness; predictions of health behavior; social networks and health.

783. **Health Care Delivery Systems**. Sociological methods and concepts in health care institutions; health care policy.

784. **Health Professions**. Interrelationships among health professions, including public health and ancillary industries; historical development and role boundary maintenance of health professions, lay and folk healers, and health marketers.

785. **Family and Health**. How family structure and family process affect health outcomes.

786. **Health and Service Delivery for Disadvantaged Populations**. Prevalence, causes, and consequences of health and mental health problems for special populations, such as homeless, poor, migrants, and African Americans; 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.

GER 790. **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.

790-793. **Seminar in Sociological Substantive Areas**. Prerequisites: Permission of advisor and graduate education director. 3 hours each.

796. **Research Seminar in Health and Aging**. Conducting social research, gaining access to research settings, getting started, writing grant applications, presenting papers at professional meetings, and thesis and dissertation proposal writing. Lectures and student presentation of research.

798. **Nonthesis Research**. Integration of theory and research methods: synthesis of data into well-written report derived from research activities. Prerequisite: Completion of major requirements. 1-6 hours.

799. **Thesis Research**. Prerequisite: Admission to candidacy. 1-6 hours.

798. **Nondissertation Research**. 1-6 hours.

799. Dissertation Research**. Prerequisite: Admission to Ph.D. candidacy. 1-6 hours.**

UAB Policies

In addition to the UAB policies contained in this handbook, other university-wide policies apply to students. These include further policies concerning health care for international students and visiting international scholars, AIDS and AIDS-related conditions, a drug-free workplace, alcoholic beverage use, smoking, sexual harassment, 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 Institutional Studies and Services Web site *(www.iss.uab.edu)*.

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

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 interfer-

ence, 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 and is available at *www.iss.uab.edu*

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 shall 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.

Copyright Policy—SUMMARY

September 18, 2006

UAB is committed to complying with all applicable laws regarding copyright and has adopted a Copyright Policy as of September 18, 2006. As a general rule, if a UAB faculty member, UAB staff or UAB student creates a copyrightable work on their own initiative, the copyright to that work will be owned by the creator. However, ownership of the copyright and the right to any revenues generated from a work may be held by other persons or entities in the following circumstances:

- If the work is prepared by a UAB faculty or staff member or student while conducting their regular employment duties, if employed, or is prepared as a result of a special commission, assignment or requirement of UAB the copyright will be owned by UAB ("Assigned Works"). Work created by a student during normal coursework, such as a term paper, thesis or dissertation, is not deemed to be as a result of a special commission, assignment or requirement of UAB, nor is any work created by a UAB faculty member when complying with the general obligation to produce scholarly or creative works.

- If the work is developed in whole or in part with the assistance of an outside sponsor or with funds granted to UAB, ownership of the copyright and any resulting revenues will be determined by the applicable provisions of the sponsorship agreement or terms of the grant ("Sponsored/Grant Works").

- If the work is not supported by a sponsor or a grant but is developed with substantial use of UAB's resources, the copyright and any revenues generated therefrom will be owned by UAB ("Substantial Use Works"). "Substantial use" of UAB's resources generally refers to the extraordinary use of personnel and physical resources, not the use of UAB's libraries, equipment or personnel in the ordinary course.

UAB has a non-exclusive, non-transferable, royalty-free license to reproduce, publicly perform or display or make derivative works of any copy-

righted works produced by a UAB faculty or staff member or UAB student as a result of such individual's own initiative and not otherwise Assigned Works, Sponsored/Grant Works or Substantial Use Works, provided UAB uses such works for educational or research purposes only. Faculty and staff members and students also enjoy similar rights to license any Assigned Works, Sponsored/Grant Works or Substantial Use Works, provided that such use is not competitive with the interests of UAB during such individual's employment with UAB or course of studies at UAB.

Faculty or staff members and students are not required to disclose any works produced by their own initiative. However, any works produced by a faculty or staff member or student which meet the criteria of an Assigned Work, a Sponsored/Grant Work or Substantial Use Work must be disclosed in writing to the unit leader and the UAB Research Foundation during its creation or immediately thereafter.

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, the university for use in connection with one's role at the university 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 a student constitutes nonacademic misconduct, and the student will be subject to established disciplinary action.

Ownership of Intellectual Property Rights

September 15, 2007

UAB recognizes that research and scholarship should be encouraged and carried out without regard to financial gain from licensing fees, royalties, or other such income. However, UAB also recognizes that patentable inventions, discoveries, software programs, and other intellectual property often arise from UAB-related student efforts.

The policies governing the administration of inventions are included in the Board of Trustees Rule 509. Other institutional policies govern other forms of intellectual property including computer software. Those policies also provide recognition and incentive to inventors and at the same time ensure that UAB shares in the rights pertaining to inventions in which it has an investment. Any income accruing to UAB is used in the furtherance of UAB's academic mission.

Disclosure of discoveries and inventions which appear to have commercial value and/or utility should be made to the UAB Research Foundation. Any such invention or discovery (1) which is the result of research carried on by, or under the direction of, any employee of the University and/or having the costs thereof paid from University funds or from funds under the control of, or administered by, the University, or (2) which is made by an employee of the University and which relates to the inventor's field of work at the University, or (3) which has been developed in whole or in part by the utilization of resources or facilities belonging to the University shall be assigned to the University. Therefore, employees or students may not themselves assign or grant any option to any such intellectual property developed during the course of their employment without a release from UAB.

Regardless of the decision about ownership, prior to leaving UAB (as upon graduation, completion of a post-doctoral fellowship, or resignation) the student must ensure that the mentor retains the original or an exact copy of all raw data, the results of all data analyses, and the drafts of all manuscripts intended for publication, dissemination, or other use. This requirement applies to all written research records (e.g., laboratory notebooks, completed questionnaires), all electronic research files

(e.g., databases, drafts of manuscripts), and all other types of research data (e.g., photographs, voice recordings, laboratory analyses, biological specimens). Publication of the results of said research, and designation of order of authorship, are to be determined jointly by mentor, student, and sponsor, in accordance with UAB policies.

Questions concerning intellectual property rights should be directed to the UAB Research Foundation.

Employee Falsification of UAB Records and Documents—Summary

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*.

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).

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 is cause 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 Associate Vice President for Human Resource Management. 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 Associate Vice President for Human Resource Management.

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 Equal Opportunity Policy–Summary

January 1, 2007

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, age, national origin, disability unrelated to program performance, disabled veteran status, or Vietnam era veteran status. 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, age, national origin, disability unrelated to program performance, disabled veteran status, or Vietnam era veteran status.

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 HRM Consultant or Human Resource Management Relations.

Faculty employees may contact the Office of the Provost or Human Resource Management Relations.

Students may contact the Office of the Vice President for Student Affairs.

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.

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- HRM Consultant/Human Resource Management Relations, Office of the Chief Human Resources Officer, Office of the Provost, Office of the Vice President for Equity and Diversity.

Students - Non-academic Judicial Affairs Officer, Disability Support Services (for disability discrimination), Office of the Vice President for Student Affairs.

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. This policy may be accessed on the web at http://www.iss.uab.edu/Pol/EeoEtab.pdf.

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 Education 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 purposes 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 student's educational record, but such records are available to another physician or appropriate professional of the student's choice if requested. Records that 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, address (local and permanent), telephone number, 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, placement service, and financial aid office 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, Academic Affairs, Room 207, Hill University Center; Associate Director for Records, School of Medicine, Room P100, Volker Hall; Director of Dental Student Affairs, School of Dentistry, Room 207, School of Dentistry Building; Assistant dean for Student Affairs, School of Optometry, Room 104, School of Optometry Building; Director of Student Services, School of Nursing, Room 105B, School of Nursing Building; Graduate Records Office, Graduate School, Room 511, Hill University Center; Director of Admissions and Enrollment Services, School of Health Related Professions, Room 117B, SHP Building; Associate dean for Academic Affairs, School of Public Health, Room 308, Ryals 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's request concerning records of 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 45 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 15 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 45 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 10 days of the conclusion of the hearing. If the decision is

adverse to the student, the notice of decision shall include 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 reasonable 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 student 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. Publication

The UAB Student Records Policy shall be pub-

lished in the catalog of each school, and a copy shall be displayed prominently on a bulletin board in each school. 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 semester.

XI. Violation of Rights

Any student who believes that UAB has violated his or her right to access or privacy of educational records as 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 following address:

The Family Educational Rights and Privacy Act Office
Department of Education
400 Maryland Avenue SW
Washington, DC 20202

Nonresident Tuition Policy

February 9, 1990

Introduction

The Board of Trustees has established a "Nonresident Tuition Policy" which addresses non-resident tuition, certification of residency status by campus officials, and establishment of campus policies to administer an appeals process. This UAB policy implements certain provisions of that Board policy.

Policy Statement

The Division of Student Affairs, the Graduate School, and the admissions/registration offices of the Health Affairs 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 the records used to substantiate that evaluation.

As the provisions of section II. of the Board policy indicate, "though certification of an address and an 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." Also, according to the provisions of the board policy, UAB has been given the authority to, 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.

The decision by an admissions or registration officer concerning certification of residency status may be appealed in writing by the student to the Vice President for Student Affairs who may overrule the decision or may, at his or her discretion, convene a review committee composed of a representative from the Office of the dean of Student Affairs, a representative from the Office of the Vice President for Academic Affairs, and a representative from the Office of the Vice President for Health Affairs. If the decision of the review committee is appealed by the student, the Vice President for Student Affairs may add a recommendation of concurrence or non-concurrence with the review committee and forward the findings to the President for determination. The decision of the President is final.

I. Tuition Fee:

All students registering at the University of Alabama, the University of Alabama at Birmingham, or the University of Alabama in Huntsville who do not establish that they are "resident students" shall pay a "non-resident student" tuition. Students shall be classified as "nonresident students" or "resident students" at the time of their initial registration and shall continue unchanged through all subsequent registrations at that institution until satisfactory evidence to the contrary is submitted at the time of any subsequent registration.

A "resident student" is one who, at the time of registration:

a) Is not a "minor" and is a resident of the state of Alabama and has been a resident of the state for at least one year immediately preceding the date of registration; or

b) Is a "minor" and whose "supporting person(s)" is a resident of the state of Alabama and has been a resident of the state for at least one year

immediately preceding the date of registration.

II. Definitions:

a) "Minor" means an individual who, because of age, lacks the capacity to contract under Alabama law; under current law, this means a single individual under 19 and a married individual under 18, but excludes an individual whose disabilities of non-age have been removed by a court of competent jurisdiction for a reason other than establishing a legal residence in Alabama.

b) "Supporting person" means either or both of the parents of the student (if they are living together) or if they are divorced or living separate, then either the parent having legal custody or, if different, the parent providing the greater amount of financial support of the two. If both parents are deceased or if neither has legal custody, then supporting person shall mean, in the following order: the legal custodian of the student and if none, the guardian, and if none, the conservator.

c) "Resident" means one whose residence is in the state of Alabama. "Residence" means the single location at which a person resides with the intent of remaining there indefinitely as evidenced by more substantial connections with that place than with any other place. Individuals claiming resident status under this policy shall certify under penalty for perjury that a specific address or location within the state of Alabama is their residence, that they intend to remain there indefinitely, and that they have more substantial connections with the state of Alabama than with any other state. Though certification of an address and an intent to remain in the state indefinitely are prerequisites to establishing status as a resident, that status shall ultimately be determined by the institution by its evaluation of the presence or absence of connections with the state of Alabama including the following:

1. Payment of Alabama state income taxes as a resident.

2. Ownership of a residence or other real property in the state and payment of state and local taxes thereon.

3. Full-time employment (not temporary) in the state.

4. Residence in the state of a spouse, parents, or children.

5. Previous periods of residency in the state continuing for one year or more.

6. Voter registration and voting in the state; more significantly, continuing voter registration in the state that initially occurred at least one year prior to the initial registration of the student in Alabama at a public institution of higher education.

7. Possession of state or local licenses to do business or practice a profession in the state.

8. Ownership of personal property in the state and payment of state taxes thereon (e.g., automobile, boat, etc.) and possession of state license plates.

9. Continuous physical presence in the state for a purpose other than attending school and except for temporary absences for travel, military service, temporary employment, etc.

10. Membership in religious, professional, business, civic, or social organizations in the state.

11. Maintenance in the state of checking and savings accounts, safe deposit boxes, or investment accounts.

12. In-state address shown on selective service registration, driver's license, automobile title registration, hunting and fishing licenses, insurance policies, stock and bond registrations, last will and testament, annuities, or retirement plans.

III. Authority to Expand the Definition of "Resident Student"

The President of each campus may recommend to the Chancellor for consideration by the board of Trustees that the term "resident student" may include any one or more of the following categories at that campus:

A) One who, at the time of registration, is not a "minor" and:

1. Is a full-time employee (not temporary) of the institution at which the student is registering or is the spouse of such an employee; or

2. Has accepted full-time employment (not temporary) within the state of Alabama or is the spouse of such an employee;

3. Is a member or the spouse of a member of the United States military on full-time active duty stationed in Alabama under orders for duties other than attending school; or

4. Is employed as a graduate assistant or fellow by the institution at which the student is registering.

B) One who, at the time of registration, is a "minor" and whose "supporting person(s)":

1. Is a full-time employee (not temporary) of the institution at which the student is registering; or

2. Has accepted full-time employment (not temporary) within the state of Alabama; or

3. Is a member of the United States military on full-time active duty stationed in Alabama under orders for duties other than attending school.

IV. Authority to Implement Policy

The presidents are authorized (and authorized to delegate to admissions offers and others) and directed to implement this policy by appropriate written policies, guidelines, and procedures. Such policy shall provide that classification as a "resident student" shall be based upon the required certificate and other written evidence to be filed in the admissions office and that any decision by an admissions officer may be appealed by the student to a review committee which shall be constituted, appointed, and operated as provided in such policy. The decision of the review committee may be appealed to the President, whose actions thereon shall be final.

Sexual Harassment Policy

January 27, 1999

Introduction

The University of Alabama at Birmingham is firmly committed to providing an environment that is free of discrimination, including sexual harassment. Sexual harassment includes unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature when (1) submission to such conduct is made, either explicitly or implicitly, a term or condition of an individual's employment or academic evaluation, (2) submission to, or rejection of, such conduct by an individual is used as the basis for employment or academic decisions affecting such individual, or (3) such conduct has the purpose or effect of unreasonable interfering with an individual's work performance or of creating an intimidating or hostile working or educational environment. Such behavior may violate federal law and/or give rise to personal liability for the results of such behavior. Consequently, UAB prohibits all forms of sexual harassment and will investigate complaints thoroughly and with the utmost seriousness.

A violation of this policy may result in the taking of disciplinary action up to, and including, discharge.

Sexual Harassment in the Workplace

It is a violation of UAB policy for any employee, including faculty, to engage in sexual harassment in the workplace or in work-related situations. Employees who believe that they have been sexually harassed by a supervisor, co-worker, or other employee of UAB should report the incident promptly to the Human Resource Management Relations Office. Only Human Resource Management has the responsibility for coordinating and conducting an investigation of sexual harassment claims in the workplace and also for recommending corrective action to the UAB administration.

Sexual Harassment in the Instructional Setting

UAB prohibits sexual harassment of student's by teaching staff or other employees of UAB. For purposes of this policy, the term "teaching staff" means all those who teach at UAB and includes, but is not limited to, full-time faculty, part-time faculty, students functioning in teaching roles (such as graduate assistants), and academic administrators.

A student who believes that he or she has been sexually harassed should report the incident promptly to the Vice President for Student Affairs.

Sexual harassment by a student is considered nonacademic misconduct, and the alleged student offender will be subject to the disciplinary process contained in the *Direction: Student Handbook*.

Sexual Harassment—General

Full and prompt reporting is necessary for effective implementation of this policy, and UAB encourages such reporting. However, UAB's duty to protect employees and student exists when UAB's supervisory personnel know, or have reason to know, of unreported sexual harassment. Supervisors therefore are directed to take all appropriate steps to prevent sexual harassment in their areas of responsibility and to take corrective action, including disciplinary action, in response to inappropriate behavior which may constitute sexual harassment even in the absence of a complaint.

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 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.)

This policy seeks to encourage students, staff, and faculty to express freely and responsibly, through established procedure, complaints of sexual harassment. All such complaints shall be treated as confidential information and shall be disclosed only to those with a need to know as part of the investigatory and resolution process. Any act of interference, retaliation, or coercion by a UAB employee against a student or employee for using this policy interferes with such free expression and is itself a violation of this policy.

Implementation

This policy will be published regularly in the *UAB Reporter* and in the *Class Schedule*. The policy will be included in revisions of handbooks relating to staff, faculty, and students.

The Vice President for Financial Affairs and Administration is responsible for implementation of this policy as it relates to sexual harassment in the workplace. The Vice President for Student Affairs is responsible for implementation of this policy as it relates to sexual harassment in the instructional setting.

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 student handbook *Direction*, 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 [December 14, 1991].

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.

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, Florinal 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[2]	Analgesic, antidiarrheal, antitrussive	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	Ativan, Dalmane, Diazepam, Librium, Xanax, Serax, Valium, Traxexe, 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, Mellitat, 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	Mexc, 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.*

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 Federal penalties and sanctions only. 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 3 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 in 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:

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

March 20, 2002

Introduction

The American College Health Association recommends that students be immunized against certain diseases. Therefore, UAB hereby establishes this policy on immunization.

For purposes of this policy, immunization against Rubeola (Red Measles) includes an initial vaccine plus a second dose of vaccine (see below).

First-time Entering UAB Students

All first-time entering students born on or after January 1, 1957, who enroll in credit courses on UAB's main campus must show proof of immunization against Rubeola (Red Measles). (*Two doses are required for proof of previous immunization: dose 1 must have been given at 12 months after birth or later, and Dose 2 must have been given after 1980*.) Enrolling students must show proof of these immunizations with either an official certificate of immunization, a photocopy of an immunization certificate, or written documentation from their physician. If the person has never been immunized, two injections of the vaccine at least one month apart are required.

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 against Tetanus, diphtheria, Mumps, Rubeola (Red Measles), and Rubella (German Measles). In lieu of being re-immunized, such individuals may present proof of having had such immunizations. If they do not have such proof or have not been immunized, they must be immunized against these 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 appropriate treatment if positive) within three months prior to enrollment or visiting. Individuals who have a history of reactive Tuberculin skin testing must provide a current chest x-ray (taken since their last reactive skin test but within three months prior to enrollment or visiting) indicating that the person currently is clear of Tuberculosis.

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 Rubeola,

Mumps, Tetanus, diphtheria, Varicella (Chickenpox), Tuberculosis, and Hepatitis B. Therefore, all UAB students in the Joint Health Sciences programs and in the Schools of Medicine, Dentistry, Optometry, Public Health, Nursing, and Health Related Professions are required to be immunized against Tetanus, diphtheria, Varicella (Chickenpox), Mumps, Rubeola (Red Measles), Rubella (German Measles), and Hepatitis B. In lieu of being re-immunized, such individuals may present proof of having had such 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.

Students completing their Hepatitis B series of vaccines must obtain Hepatitis B titer 1 to 2 months after their third vaccine to see if additional boosters are necessary. If the titer is negative, students will be given the option either to repeat the entire Hepatitis B series or to take 1 to 2 Hepatitis B "booster" shots to try to attain a positive titer. Students who have completed their Hepatitis B vaccine series prior to matriculation are required to take a Hepatitis B titer prior to participating in a clinical environment to see if additional boosters or labs are required.

All students enrolled in health-related schools must have had a Tuberculin skin test with negative results (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 before starting clinical rotations and are mandated to renew their Tuberculin one-step skin test once per year.

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.

Individual UAB schools may impose additional immunization requirements as needed for their students.

Exceptions

Exceptions to this policy will be made only for those students who can document medical or religious contraindications to the vaccine. Such documentation must be submitted to the appropriate admissions or registration office as indicated in the procedures to implement this policy.

Implementation

The Provost (in conjunction with the Vice President/Dean, School of Medicine and the Assistant Vice President for Enrollment Services and University Registrar) is responsible for procedures to implement this policy for students in the Joint Health Sciences programs and in the Schools of Medicine, Dentistry, Optometry, Public Health, Nursing, and Health Related Professions.

The Vice President for Student Affairs (in conjunction with the Assistant Vice President for Enrollment Services and University Registrar and the Associate Vice President for Enrollment Management) is responsible for procedures to implement this policy for all other UAB students.

Health Care Policy for International Students and Scholars

May 1, 2000

The Office of International Scholar and Student Services is responsible for procedures to implement this policy for international students and international scholars.

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 cover-

age. 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 President for Student Affairs 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 requiring 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 devices 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.