

DEPARTMENT OF BIOSTATISTICS UNIVERSITY OF ALABAMA AT BIRMINGHAM GRADUATE STUDENT HANDBOOK 2012-2013

ADMINISTRATIVE ORGANIZATION

The Department of Biostatistics at the University of Alabama at Birmingham (UAB) is one of five departments in the School of Public Health: Biostatistics, Environmental Health Science, Epidemiology, Health Behavior, and Health Care Organization and Policy.

Dr. Naomi Fineberg is the Chair of the department, Dr. Leslie McClure is the Director of Graduate Studies, and Della Daniel is the department liaison to the graduate program. The department currently has 24 faculty members, 56 full-time staff, and is organized into two sections: 1) The Section on Statistical Genetics (SSG), led by Dr. Hemant Tiwari and 2) The Section on Research Methods and Clinical Trials (RMCT), led by Dr. Gary Cutter. Members of the department conduct research in statistical methodology and applications, as well as in fundamental problems of modeling in biological systems. Much of the department's research is collaborative in nature involving projects from basic science, genetics, clinical medicine, public health, and other health-related areas, both within and outside of UAB. Grant support for faculty in the department fall into four broad areas: 1) applied grants involving the application of statistical methods to health-related issues, 2) statistical coordinating centers for large multi-center randomized clinical trials, 3) methodological grants advancing statistical techniques, and 4) training grants for preparing the next generation of statisticians.

The Department offers programs leading to the Doctor of Philosophy (PhD), Master of Science (MS), Master of Public Health (MPH), Master of Science in Public Health (MSPH), and a Certificate in Statistical Genetics (CSG). The MS and PhD degrees are offered through the Graduate School. The MPH and MSPH degrees are offered through the School of Public Health.

GENERAL INFORMATION

Admission to MPH, MS, MSPH, and Ph.D. Programs

Students in the graduate program are admitted in the fall semester of each academic year. Applicants for the MS and Ph.D. programs are expected to have a strong foundation in mathematics. At the very minimum, they should have had a 3-semester sequence of calculus or equivalent and a semester of advanced matrix algebra. With few exceptions, applicants to the Ph.D. must have a relevant Master's degree. The M.P.H. applicants should also be quantitatively oriented with background in calculus and linear algebra.

Application requirements include completion of the online application form, a non-refundable application fee, official transcripts from all undergraduate coursework and all prior graduate coursework, (International transcripts must be submitted to World Education Services (WES) or Educational Credential Evaluators (ECE) for an official course-by-course credential evaluation; document-by-document evaluations will not suffice), three letters of recommendation (submitted online), a statement of purpose, and Graduate Record Examination (GRE) scores. International applicants for whom English is not their first language are also required to submit TOEFL scores. Please note that the department has an ongoing admissions process that begins in February. Thus, it is recommended that prospective students submit completed applications as early as possible (specifically if financial support is desired).

Minimum admission requirements include: a bachelor's degree from an accredited college or university, a score of 156 (146 for MPH) on the verbal and 146 on the quantitative sections of the

newly revised GRE exam. GRE exams taken prior to August 1, 2011, a minimum score of 1100 on the combined verbal and quantitative sections, with a verbal score of at least 550 (400 for MPH) and a quantitative score of at least 550, a score of 3.5 on the analytic section of the GRE test, and an undergraduate grade point average of 3.0 or better (on a 4.0 scale). The department also requires a TOEFL score of at least 250 (600 on the old scale) for all international students whose native language is not English.

All students enrolled in the MS, MSPH, and Ph.D. programs must participate in the 12.5 hour WebCT course entitled "Overview of Public Health". This mini-course must be completed by the students second semester of program enrollment. Registration will be flagged until this requirement is completed. Students with prior public health education (course work in each public health core discipline) or experience (5 years experience in public health) may be waived from this requirement. Please contact Cheryl Johnson, Director of Student Services for the School of Public Health, for waiver information.

Admission to MSPH Program

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 faculty members. The GRE is required for applications to all MSPH programs in the School of Public Health. A minimum score of 146 on the verbal and 146 on the quantitative sections are recommended. GRE exams taken prior to August 1, 2011, a minimum score of 1080 on the combined verbal and quantitative sections, with a verbal score of at least 400 and a quantitative score of at least 550, and a score of 550 (or 3.5) on the analytic section of the GRE test are preferred. The GRE may be waived 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 along with 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.

Academic Advisors and Plan of Study

The Graduate Program Director assigns each student a faculty member to serve as an academic advisor upon entering the program. The purpose of the academic advisor is to help students stay on track for their degree and to take the required courses in the proper order. This is important since many courses are offered in sequences and later courses cannot be taken without having had the proper prerequisites.

The student must complete a "Plan of Study" form during their first year, with the help of his/her academic advisor. The plan of study should include a list of all courses to be taken at UAB, including the required courses, electives, readings & research courses, transferred courses, and any other courses relevant to the student's research. The plan of study, and any subsequent changes in it, must be approved by the Graduate Program Director. The advisor will evaluate the progress in the plan of study each semester until all courses listed in the plan are completed. Prior to registering for classes each semester, there is a hold placed on registration for all students until the student and academic advisor meet to evaluate the progress in the plan of study and discuss the courses the students should take during the next semester. At the conclusion of this meeting, the academic advisor should approve the courses and give permission to remove the hold on registration. Each student should then see Mrs. Della Daniel who can provide the access code needed to register for courses.

As the area in which a Ph.D. student wishes to complete their research becomes known, the student may approach a faculty member with special expertise or interest in the chosen area to be a dissertation advisor. The selection is usually done within six months after the successful completion of the qualifying examination. The selection is done by mutual agreement between the student, the proposed research advisor, and the Graduate Program Director. Once the research advisor is

selected, the research advisor will take over the responsibility for academic advising, with certain exceptions.

Transfer/Substitution/Waiver of Courses

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. No more than 12 semester hours of transfer credit can be applied to a degree program. If a student has previously taken required courses elsewhere that counted towards their degree requirements, up to 12 semester hours of course requirement may be waived. All transfers and waivers must be initiated by the student and require the approval of the Graduate Program Director and the Dean of the Graduate School. A "Transfer/Substitution/Waiver of Course Form" must be completed and submitted along with transcripts and a syllabus from the previous course to the Graduate Program Director and instructor of the course to be waived for approval. If approved by the Graduate Program Director and course instructor, the request will be forwarded to the Graduate School. All students should note the distinction between waiving credit hours and transferring credit hours. Only graduate credits that have **not** been applied toward another degree are eligible for transfer. If credit hours are waived, the student must still obtain the minimum number of credit hours required by the Graduate School [a minimum of 33 graduate credit hours of coursework for the MS degree and 57 graduate credit hours of coursework (not including Research and Thesis/Dissertation hours) for the Ph.D.]. No 700 level doctoral core requirements can be transferred, substituted, or waived.

A student must take, get transfer/substitution credits, or get official waiver for all required courses. **In no instances will a student be allowed to substitute another course from the Department of Biostatistics (such as Readings and Research, Special Topics, etc.) for a required course.**

Seminars

Both the SSG and RMCT sponsor a seminar series. The goals of these seminars are: 1) to promote biostatistics, applied research, and biostatistical methodology; 2) serve as a learning opportunity for both students and faculty; 3) foster communication, collaboration, professionalism, and career development among all participants. Presentations are made by faculty, visiting professors, staff, students, and collaborating investigators. These seminars consist of one hour presentations and discussions of current research on both methodological developments and collaborative work with other researchers. Both local and visiting speakers (often of international renown) present. Departmental seminars are often videotaped and posted on the department website, along with a synchronous PowerPoint slide show of the presentation. This resource allows students to view and learn from past seminars. The department always welcomes suggestions related to the seminar series (e.g., speakers, topics, etc.). Students are also encouraged to attend other seminars in related areas within the School of Public Health, the School of Medicine, and the University at large.

All students are expected to attend all departmental seminars, unless there is a conflict with course times. Students enrolled in the MS and PhD programs are required to attend seminars, through the BST 691 course. MS students must enroll in BST 691 at least 4 semesters, and PhD students must enroll in BST 691 at least 6 semesters. These seminars are considered an essential part of the education of all students in biostatistics. The department recognizes that a student may not fully understand the content of every seminar. However, the cumulative effect of all such seminars is substantial, and is an integral part of the preparation toward the future role as a professional statistician. Students are also required to attend other seminars within the School of Public Health, the School of Medicine, and the university at large.

Statistical Consulting

Regardless of the degree sought, an integral part of the training in biostatistics is to prepare students to be effective statistical consultants. MS and Ph.D. students are expected to collaborate with other biomedical researchers at UAB and provide statistical consulting under the supervision of the faculty.

Each student has the opportunity to gain experience in applying statistics to real problems. This experience is considered to be a vital part of the graduate program since it helps develop skills as a statistician, serves to increase understanding of the theory learned in the classroom, and prepares the student for summarizing statistical work to non-statistical audiences. All students should note that this is *not* a didactic course. Rather, this is intended to involve the student in an ongoing research project with the intent that no student should leave the program without some basic fundamental experience in actually applying statistics to real-world problems.

Leave of Absence

A student who needs to take an extended leave of absence (more than 2 weeks) must contact the Graduate School and fulfill the requirements for leave of absence, in addition to getting permission from their advisor and the Graduate Program Director. Other than special cases, funding will be suspended during an extended leave of absence.

Academic Misconduct

Both the School of Public Health and the Graduate School expect that students will obey the Honor Code (accessed at <http://www.soph.uab.edu/students/honorcode>). The Department of Biostatistics strictly observes these guidelines. The Graduate School has an extensive and explicit procedure for hearing charges of academic misconduct, which is detailed in the UAB Graduate Student Handbook (accessed at http://www.uab.edu/graduate/images/acrobat/forms/UAB_Grad_Handbook.pdf).

International Students

All international students must demonstrate proficiency in spoken and written English before graduation, through the Graduate School's ESL Assessment. Dependent on the results of that assessment, the GPC may require additional course work in both written and/or oral English for students not showing proficiency upon arrival, or during any period of their graduate studies.

Grading Policy and Policy on Dismissal

Academic excellence in the classroom and in research, and continuing professional behavior are required of all students. All students must maintain a minimum GPA of 3.0 in regular course work (courses that do not get a Pass/Fail grade). If the GPA falls below 3.0, the student will be placed under probation for a maximum of two semesters (excluding summer). The student must maintain a 3.0 average in each of those two semesters, and the cumulative GPA at the end of the second semester must be brought up to at least 3.0. Failure to meet these criteria will result in the student being recommended for dismissal.

Any student who receives a grade of "F" in any biostatistics core course will be removed from the program immediately. Any student who receives a grade of "C" in any biostatistics core course will be placed on academic probation for a maximum of two (excluding summer) semesters. Within that time he/she must retake the course and obtain a better grade. Failure to improve the grade within two semesters will result in the student not being permitted to continue in the program.

Any student who obtains an incomplete grade ("I") will have one semester to complete the requirements to obtain a grade in the course. If work is not completed in that time, the grade will automatically be changed to "F".

Financial Support

Unfortunately, the department is not able to guarantee funding for all students. However, there are many on-campus part-time employment opportunities with on-going research projects across campus that are available to qualified students with experience in statistical analysis. Within reason,

the department will work with all students in order to assist them with finding a funding source for their studies.

Fellowships, Traineeships, and/or Assistantships are awarded to well-qualified students. The financial support of a fellowship or traineeship typically consists of (i) an annual stipend of \$22,032 paid over 12 months, and (ii) tuition, fees, and health insurance paid by the department directly to your student account. The financial support of an assistantship typically consists of (i) an annual stipend of \$21,000 paid over 12 months, and (ii) \$7,000 additional funds to assist with tuition and etc. (paid as additional salary to the student in two installments in August and January, \$3,500 each month). The financial support is intended to help full-time students in the graduate program. Accordingly, (i) students must register as a full-time student in approved graduate courses each semester (9 hours fall, 9 hours spring, 3 hours summer) and (ii) students may not engage in any other remunerated activities either on or off campus (exceptions to this rule are rare and require prior approval in writing). In order to continue receiving financial support students must remain in good standing, continue making satisfactory progress towards their degree, and perform their work in a satisfactory manner. Should the faculty responsible for the funding source determine that a student fails to meet any of these criteria, he/she forfeits the award.

A research assistantship requires the student to devote approximately 20 hours per week average effort on research/teaching projects under the supervision of a faculty mentor. Students must be enrolled full-time in order to maintain a research assistantship. This requires the student to take at least 9 credit hours of coursework during the regular semesters and at least 3 credit hours of coursework during the summer. Assistantship appointments are typically for one year at a time.

A student fellowship does not require any work effort, but requires the student to register for a greater number of credit hours each semester. A student on Fellowship is required to take 9 credit hours of coursework during the regular semesters and 6 credit hours during the summer semester.

The department currently has one NIH-funded T32 doctoral training grant. This appointment carries special distinction, is an honor to have, offers certain privileges, and also confers certain obligations. Trainees are required to pursue their research training on a full-time basis, devoting at least 40 hours per week to the program. This *minimum* of 40 hours includes both classroom studies and their research. All new trainees will receive: 1) "On Being a Scientist" published by the National Academy of Sciences, and 2) a selected list of references on ethical conduct of research. Trainees are expected to review these materials. All trainees must complete and maintain IRB training/certification, complete and maintain IACUC training/certification (if they work with animal studies), complete the Principles of Scientific Integrity course (GRD 717), and complete university diversity training. Trainees are expected to attend all departmental seminars, journal clubs, and grant writing clubs, except when those activities interfere with classes. Trainees are also expected to attend and ideally present their work at one conference each year. Funds are available for this. Additional funds are usually available to allow trainees to attend at least one continuing education workshop outside of UAB each year. The department holds all T32 students to a very high standard. The purpose of the T32 training grants is to train future independent scientists, that is, individuals that can direct their own research programs. Trainees are expected to work actively with a faculty mentor on research projects, with the expectation of co-authoring publications. All trainees must meet with the T32 program directors twice annually (and additionally as requested) in order to review progress.

Reclassification of Residency

The School of Public Health allows the reclassification of residency for tuition purposes for students receiving institutional support as a graduate, teaching, or research assistant employed within the School of Public Health. Students who wish to take advantage of this should complete a *Reclassification of Residency Form*. The reclassification will be good for one semester. The Dean's office will need to verify the student's employment status for future semesters. If the student is no

longer employed as a graduate assistant in the capacity in which he/she was approved, the Dean's office will inform the Graduate School and the student will be responsible for out-of-state tuition.

Computer Access

All incoming students will be required to have a laptop. Please review the enclosed ***School of Public Health Guidelines for Student Laptops*** memo for laptop specification details. If you have questions regarding the laptop guidelines, please contact Richard Mailhot at rmailhot@uab.edu. In addition, there is a computer lab located on the first floor of the Ryals building.

Desk Space

Limited space is available for graduate students. Priority is given to students who are supported by a traineeship or assistantship. Space allocations are reviewed each semester and are renewed in August. However, designated space can be reassigned at any time as needed.

Forms

The department administrator maintains copies of most forms necessary for the graduate programs. A complete listing of most forms that will be required is provided at the end of this document. These forms can also be obtained at the graduate school website: <http://www.uab.edu/graduate/online-forms>.

Visiting Professors Program

The SSG has a well established visiting professors (VP) program. This program involves individuals coming for both short-term visits (e.g. several days) as well as long-term visits (e.g., several months). These VPs are generally well-established senior individuals. Such VPs not only serve as an outstanding source of education, but they also serve as an outstanding source of inspiration for trainees.

Journal Clubs

Both the SSG and RMCT sponsor a monthly journal club. The SSG Journal Club meets on the first Thursday of every month. The RMCT Journal Club meets 7 times a year, on a monthly basis during non-final exam months of each semester. For each journal club, a student, post-doctoral fellow, or faculty member chooses an article and leads the discussion. This discussion generally involves a brief review of the article and related topic issues. The goals of the journal clubs are: 1) Enable students to become comfortable reviewing the statistical literature regarding theoretical and applied biostatistics, 2) Allow students to select review material, coordinate the review with a faculty member, and lead the session (which involves learning how to critically evaluate the statistical literature), 3) Improve knowledge of tools and resources available to students, 4) Keep up to date on the current literature, and 5) to foster a relaxed faculty-student learning environment. **All students are expected to attend departmental journal clubs, unless there is a conflict with course times. All Ph.D. students are expected to lead at least one journal club during their studies.**

Grant Writing Club

The SSG hosts a monthly pizza lunch and grant writing club. This club is attended by people from graduate students to senior scientists, but is geared towards the needs of investigators with little grant writing experience. Topics of discussion include how to select an area for investigation, formulate a precise hypothesis or research question, design a feasible series of experiments, select a target funding mechanism, and successfully communicate one's ideas in a grant proposal. **All students supported by T32 training grants are expected to attend the grant writing club, unless there is a conflict with course times.**

Awards

In 2002, the SSG implemented the Janet L. Norwood Award, an annual award for outstanding achievement by a woman in the statistical sciences. Dr. Norwood was the first female commissioner of the U.S. Bureau of Labor Statistics and is Past-President of the American Statistical Association. In 2008, the department implemented the Charles R. Katholi Distinguished Dissertation Award. The Katholi Award is presented to a student graduating with a doctoral degree during the previous academic year who demonstrates superior performance in academics, knowledge in biostatistics, and overall contributions to student life in the department. Each fall, the Norwood Award winner delivers a lecture at UAB. Both awards are presented in conjunction with this lecture. **All students are invited and encouraged to attend.**

THE MPH PROGRAM

The MPH degree in biostatistics is intended primarily for those who wish to acquire an MPH degree with an emphasis on statistical methodology. This can include individuals from decision-making positions in health care settings as well as those interested in data management, statistical analyses and interpretation, and presentation of analytical results. This degree can be completed in approximately 2 years. Note that the MPH does not require some of the theoretical courses required for the MS, and as such, it is not a direct route to prepare a student for a PhD. **Students anticipating that they will wish to continue for a PhD in biostatistics are advised to pursue the MS rather than the MPH.**

All international students must demonstrate proficiency in spoken and written English before graduation, through the Graduate School's ESL Assessment. Dependent on the results of that assessment, the GPC may require additional course work in both written and/or oral English for students not showing proficiency upon arrival, or during any period of their graduate studies.

Required Courses: M.P.H. in Biostatistics			Credit Hours
			<u>43-44</u>
MPH Core:	BST 621	Statistical Methods I	3
	BST 622	Statistical Methods II	3
	ENH 600	Fundamentals of Environmental Health Science	3
	EPI 600	Introduction to Epidemiology	3
	or		
	EPI 610/Lab	Principles of Epidemiology Research/Lab	4
	HB 600	Social and Behavioral Sciences Core	3
	HCO 600	Introduction to Public Health Systems and Population-Based Health Programs	3
	PUH 695	Public Health Integrative Experience	1
	GRD 727	Writing and Reviewing Research	3
Biostatistics Core:	BST 619	Data Collection and Management	3
	BST 626/Lab	Data Management/Reporting with SAS	3
	BST 697	Internship in Biostatistics	3
Biostatistics Electives:	Minimum 9 credit hours of regular courses of 623 or higher-level.		
Outside Electives:	A minimum of 3 graduate credit hours of electives must be taken from some field of Biology, Public Health or Medicine. The academic advisor must approve these courses.		

MPH Competencies

Core CEPH Competencies in Biostatistics for all MPH Students (All are covered in BST 600, BST 611-612, or BST 621-622):

1. Describe the roles biostatistics serves in the discipline of public health including applications in other areas of public health and the health sciences
2. Apply descriptive techniques commonly used to summarize public health data
3. Utilize the logic and language of scientific methods in public health and other life science research
4. Use key concepts of probability, random variation, and commonly used statistical distributions
5. Understand and utilize basic biostatistical concepts and distinguish among the different measurement scales and the implications for selection of statistical methods to be used based on these distinctions.
6. Describe the basic methods of measurement including reliability and validity.
7. Use basic statistics in testing hypotheses and setting confidence intervals and apply common statistical methods for inference.
8. Specify preferred methodological alternatives to commonly used statistical methods when assumptions are not met.
9. Understand analysis of basic experimental designs and apply descriptive inferential methodologies according to the type of study design for answering a particular research question.
10. Understand simple and multiple linear regression.
11. Interpret results of statistical analyses found in public health studies.

Core CEPH Competencies for MPH Students with a focus in Biostatistics:

1. Describe the basic concepts of probability, random variation, and commonly used statistical probability distributions (BST 611).
2. Distinguish among the different measurement scales and the implications for selection of statistical methods to be used based on these distinctions (BST 611).
3. Apply common statistical methods for inference (BST 611-612).
4. Describe preferred methodological alternatives to commonly used statistical methods when assumptions are and are not met (BST 611-612).
5. Apply descriptive and inferential methodologies according to the type of study design for answering a particular research question (BST 611-612).
6. Apply basic informatics techniques with vital statistics and public health records in the description of public health characteristics and in public health research and evaluation (BST 611-612, BST 697).
7. Interpret results of statistical analyses found in public health studies (BST 611-612, BST 619).
8. Develop written and oral presentations based on statistical analyses for both public health professionals and educated lay audiences (BST 697).
9. Utilize common computer programs to aid in analysis, description, and presentation of statistical data and results.

The MPH Non Coursework Requirements: The Internship

As a student in the MPH program, you are required to complete three credit hours of an internship experience. The internship is a field experience which bridges professional academic preparation and public health practice. Knowledge and skills learned in coursework are applied in an agency

setting under the supervision and guidance of an experienced public health specialist. You may check with the schools internship coordinator Emily Tubergen (ejt3@uab.edu or 934-7791), or the school's website at www.soph.uab.edu/internships for internship opportunities. Faculty research projects are not appropriate venues for an internship, nor are positions which are primarily administrative or focused on data management.

Registering for Internship Experience

Before the hold on the internship course can be lifted, we require that the internship description and agreement form is completed and on file. This form is to be completed in the online internship database Intern Track. You can log in to this program with your BlazerID and password at www.soph.uab.edu/intertrack. Your faculty advisor and site supervisor will also be required to sign off on this document, so it is important that you communicate with them as you complete the form, and do not wait until the deadline to register. A hyperlink allowing you to formally request the hold to be lifted will become active once all the signatures are on file.

You should register under your academic advisor for BST 697 – Internship in Biostatistics. For three credit hours, you are expected to spend a minimum of 240 hours during the 12 weeks working for the agency. The internship must be completed in one semester, and all hours must be completed by the last day of exams. You are required to complete your core course work before registering for internship hours. Credit cannot be applied retroactively to work you have done prior to registering for the internship. Students should feel free to contact the Graduate Program Director (Dr. McClure) or Internship Coordinator (Emily Tubergen) if they have any questions or problems during the summer.

Grading and Requirements

The internship is a pass/fail course. Your grade will be assigned by your faculty advisor based on the completion of all the components below. All forms related to the MPH internship will be completed in the InternTrack program.

- Internship Description and Agreement Form
- Midpoint Meeting Form, and confirmed meetings with the faculty advisor and site supervisor
- Final student evaluation
- Final student paper
- Completion of poster and attendance at the internship poster session
- Evaluations (Midpoint and Final) from the site supervisor
- Any additional product required by your internship site

Midpoint meeting: You will be required to complete a midpoint form halfway through your internship. This is to prompt your reflection on the internship to that point, and steps to make the remainder of the internship a success. You will set up times to individually meet with your faculty advisor and site supervisor; use the midpoint form as a guide for your conversation. If you are not able to meet in person, discussions via telephone, email, or Skype will be accepted. Your faculty advisor and site supervisor will need to confirm the meeting took place in the Intern Track system.

Internship Poster Session: At the end of the internship, prior to the end of exams for that semester, a poster session will be held to showcase the internships completed during that semester. You will receive additional instructions on creating your poster prior to the event. Attendance is mandatory, as it is a required component to the internship experience. Limited exceptions will be made for students completed internships out of the state or country or that are completing the MPH program online.

For complete internship requirements please check out the syllabus on the UAB School of Public Health website: <https://www.soph.uab.edu/files/internship/InternshipSyllabus2011.pdf>.

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 National Institutes of Health (NIH) to prepare such individuals to meet the demand for clinical investigators in the field. Locally, the Schools of Medicine and Public Health have combined efforts to create a training program for young faculty members and fellows from a variety of disciplines.

This program is a post-medical or other health science degree training program, aimed primarily at fellows and faculty members interested in developing skills required for clinical research. It is anticipated that this academic training will supplement extensive training in the content area in which the student is trained, and senior mentoring in the politics and policies of 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 set of courses common to all students, plus research electives 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 (CTSB), epidemiology (CTE), and health behavior (CTSH). As a result, there will be some variation in the specific knowledge and skills acquired by each graduate. However, the primary learning objectives will apply to all students, irrespective of departmental affiliation. As such, graduates will be able to do the following upon completion of the program:

- design, conduct, and evaluate clinical research studies;
- understand issues of data collection and study management;
- follow appropriate policies and procedures relating to the utilization of human subjects in clinical research;
- demonstrate an understanding of the ethics of research on human subjects;
- prepare competitive applications for extramural research funding;
- prepare manuscripts for publication in the scientific literature; and
- critically evaluate published research.

Required Courses: MSPH in Biostatistics

The MSPH in Clinical and Translational Science consists of a minimum of 41 credit hours. Of these, 14 hours are required, including 9 hours of specific biostatistics courses and 5 hours of specific epidemiology courses. Students then select at least 9 hours from a list of approved Masters Research Electives, complete 9 hours of focus specific electives in biostatistics, and take at least 9 hours of directed (698 level) masters research to fulfill the MSPH requirement for conducting a research project.

All international students must demonstrate proficiency in spoken and written English before graduation, through the Graduate School's ESL Assessment. Dependent on the results of that assessment, the GPC may require additional course work in both written and/or oral English for students not showing proficiency upon arrival, or during any period of their graduate studies.

Coursework		Credit Hours
<u>Required Core Courses</u>		<u>41</u>
Biostatistics Core:	BST 621 Statistical Methods I	3
	BST 622 Statistical Methods II	3
	BST 625 Design and Conduct of Clinical Trials	3
	EPI 607 Epidemiology of Clinical Research	3
	EPI 680 Topics in Clinical Research (P/NP) ¹	2

Masters Research Electives²

A minimum of **9** credit hours taken from the following courses (selected by faculty advisor and student):

BST 619	Data Collection and Management	3
BST 626/Lab	Data Management/Reporting with SAS	3
ENH 650	Essentials of Environmental and Occupational Toxicology and Diseases	5
EPI 625	Quantitative Methods in Epidemiology	3
EPI 703	Grant Proposal Writing	3
EPI 709	Theoretical Basis of Epidemiology	3
HB 624	Advanced Theory and Practice in Behavioral Science	3
HCO 677	Patient-Based Outcomes Measurement	3

Biostatistics Electives: Minimum 9 credit hours of regular BST courses of 623 or higher-level. With approval of the advisor, courses included in the research electives that are not taken to meet that requirement may be taken as part of the focus specific electives.

Masters Project Research: Minimum 9 credit hours of supervised research in clinical setting (BST 698).

The MSPH Research Project

The student, with the advice of his/her chosen MSPH project co-directors forms a small committee to guide the research project. The committee co-chairs should consist of a faculty member from Biostatistics and an MD with experience in the area of clinical research. Upon successful completion of the project, the student must submit a final write-up of the research.

THE MS PROGRAM

The MS degree in Biostatistics is intended primarily for those who wish to acquire a master's degree with an emphasis in statistical methodology. Generally, students who anticipate a career performing data management and statistical analysis would enroll in the MS program. Further, the MS program is the appropriate program to prepare students to enter the PhD. Successful completion of this degree requires a GPA of 3.0 or better, passing the comprehensive examination at the MS level, completion of a master's project under the direction of an advisor with committee approval, and oral and written defense of this project.

All international students must demonstrate proficiency in spoken and written English before graduation, through the Graduate School's ESL Assessment. Dependent on the results of that assessment, the GPC may require additional course work in both written and/or oral English for students not showing proficiency upon arrival, or during any period of their graduate studies.

Required Courses: MS in Biostatistics

		Credit Hours	
		<u>43</u>	
Biostatistics Core:	BST 621	Statistical Methods I	3
	BST 622	Statistical Methods II	3
	BST 623	General Linear Models	3
	BST 626	Data Management / SAS	3

² Care must be exercise when selecting these courses since some have prerequisites that must be taken earlier in the sequence of classes or taken concurrently.

BST 631	Statistical Theory I	4
BST 632	Statistical Theory II	4
BST 655	Categorical Data Analysis	3
BST 691	Biostatistics Predoctoral Seminar Series	4

Biostatistics Electives: Minimum 6 credit hours of regular courses of 624 or higher-level. For those students planning to go on for the Ph.D., it is a good idea to take more advanced biostatistics courses as electives.

Outside Requirement: EPI 610 - Principles of Epidemiological Research 4

Outside Electives: A minimum of 3 additional graduate credit hours of electives must be taken from a non-quantitative field (i.e. Biology, Public Health or Medicine). The academic advisor must approve these courses.

MS Competencies

1. Understand common statistical models and applications of probability; commonly used sampling distributions, and density functions (BST 621, BST 631)
2. Recognize and implement parametric and nonparametric analysis methods for testing hypotheses (BST 621-622)
3. Understand and utilize analysis of variance designs with the use of contrasts and multiple comparisons procedures (BST 621, BST 623)
4. Utilize simple survival analysis and multivariate methods (BST 622, BST 623, BST 655)
5. Understand and apply linear and multiple regression using matrix approach (BST 623)
6. Understand weighted and nonlinear regression (BST 623)
7. Utilize variable selection methods; modeling techniques; regression diagnostics and model validation (BST 621, BST 623)
8. Distinguish between, apply, and analyze common experimental designs (BST 623)
9. Determine moments and use moment generating functions (BST 631)
10. Utilize exponential families, marginal and conditional distributions, transformation, and change of variables (BST 631-632)
11. Understand convergence concepts and large sample theory (BST 631-632)
12. Understand sufficiency and likelihood principles (BST 632)
13. Define, derive, and investigate properties of maximum likelihood and moment estimators (BST 632)
14. Derive likelihood ratio tests and uniformly most powerful tests (BST 632)
15. Derive confidence intervals from inverting a test and use of pivotal quantities (BST 632)
16. Recognize and implement statistical methods associated with categorical data (BST 621, BST 655)
17. Utilize logistic regression models and understand associated regression diagnostics (BST 621, BST 655)
18. Interpret and communicate results of statistical analyses (BST 698)

MS Comprehensive Exam

Upon completion of the first year-and-a-half of course work, the candidate is given a written examination consisting of two parts - Applied Statistics and Theory of Statistics. The exam will test the students on their understanding and comprehension of the foundation of the theory and applications of statistics, and will generally cover materials from BST 621, 622, 623, 626, 631, 632 and 655. This will be a standard departmental exam, administered by the GPC. The criteria for evaluation are the candidate's understanding and competency in basic principles and foundations of

biostatistics, understanding of the appropriate use and interpretation of statistical methods, and ability to succinctly express in writing the results of the problems. This examination is offered during the first half of January. At first attempt, a student must take both parts at the same time. For those years during which at least one student needs to take the exam a second time, the exam may be offered in July at the discretion of the GPC. Students must be registered for at least 3 semester hours of graduate work during the semester in which the comprehensive examination is given.

The student must pass each part of the exam at the Masters level. If a student fails either part of the exam, one additional chance will be given to retake the part of the exam that was failed. A student who fails the qualifying exam more than once will be dismissed from the MS program. The student has the opportunity to appeal the decision of his/her dismissal. The Graduate School policies on dismissal from the program and appeal of dismissal are described in detail in the UAB Student Handbook.

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.

Masters Project

Immediately after passing the MS Comprehensive examination, the student must form a research project committee consisting of at least 3 members, chaired by the research advisor. Upon successful completion of the project, the student must submit a final write-up of the research and present their work orally in a departmental seminar. It is strongly suggested that the write-up is such that it may lead to an article submitted for publication in the subject matter area. The date and time of the oral presentation will be advertised in the Ryals Building.

All students must be registered for a minimum of 3 credit hours of Non-Thesis Research (BST 698) during the semester in which you intend to graduate. When you are nearing completion of your research, you must file an Application for Degree with the Graduate School by the appropriate date during the semester in which you expect to graduate.

Summary of Steps to the MS Degree

- Step 1. The student must successfully complete all of the core courses.
- Step 2. The student must pass the qualifying exam at the master's level.
- Step 3. Working with their chosen research advisor, the student should select a research committee and conduct a research project.
- Step 4. The student prepares and submits a final written summary of the project to the department and presents the work orally in a departmental seminar.

MS students are generally expected to complete all degree requirements within **5 years of matriculation**. One extension of this time limit can be requested when mitigating circumstances preclude completion of the requirements within 5 years. The recommendation for an extension should include a plan and timeline for completion. Such requests require the approval of the 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 before graduation may not be applied towards the degree without the approval of the Graduate Program Director and Dean of the Graduate School.

THE PHD PROGRAM

The PhD degree in biostatistics provides a balance between theory and application. In addition to providing students with an in-depth understanding of statistical theory and methodology, the main objectives of the program are to train students to become independent researchers, effective statistical consultants and collaborators in scientific research, and effective teachers.

All international students must demonstrate proficiency in spoken and written English before graduation, through the Graduate School's ESL Assessment. Dependent on the results of that assessment, the GPC may require additional course work in both written and/or oral English for students not showing proficiency upon arrival, or during any period of their graduate studies.

Required Courses: PhD in Biostatistics

All students entering the PhD program are required to complete the coursework required for the MS degree. As described above, it is possible for a student entering the graduate program with an MS degree in statistics or biostatistics from another institution to waive up to 12 credit hours of coursework at the discretion of the GPC. It will be the student's option whether to actually obtain the MS degree, but the department strongly encourages that they do so, since the completion of the master's project is very good research experience and may lead to a publication.

			Credit Hours
			<u>72-84</u>
PhD students are required to take the following courses.			
Biostatistics Core:	BST 621	Statistical Methods I	3
	BST 622	Statistical Methods II	3
	BST 623	General Linear Models	3
	BST 626/Lab	Data Management/Reporting with SAS	3
	BST 631	Statistical Theory I	4
	BST 632	Statistical Theory II	4
	BST 655	Categorical Data Analysis	3
	BST 691	Biostatistics Predoctoral Seminar Series	6
	BST 723	Theory of Linear Models	3
	BST 735	Advanced Inference	3
	BST 760	Generalized Linear and Mixed Models	3
	BST 765	Advanced Computational Methods	3
Biostatistics Electives:	Minimum 12 credit hours of 624 or higher-level regular courses, including at least 9 hours of 700 level courses.		
Outside Requirement:	EPI 610 - Principles of Epidemiological Research		4
Outside Electives:	A minimum of 3 additional graduate credit hours of electives must be taken from a non-quantitative field (i.e. Biology, Public Health or Medicine). The academic advisor must approve these courses.		
Readings & Research:	Students are strongly recommended to take Research in Statistics (BST 698) under various faculty members every semester after completion of the first-year equivalent of course work, until a research advisor is chosen.		

PhD Competencies

In addition to the MS competencies, PhD graduates should acquire these additional competencies:

1. Understand the theory of multivariate normal distributions and quadratic forms (BST 723)
2. Understand theory of and implement least squares estimation; weighted least squares estimation (BST 723)
3. Understand theory of and implement contrasts testing and multiple comparisons procedures (BST 723)

4. Understand maximum likelihood theory of log linear models (BST 723)
5. Distinguish families of models (BST 735)
6. Define likelihood and sufficiency (BST 735)
7. Utilize significance tests and point and interval estimation (BST 735)
8. Define invariant tests; asymptotic theory and large sample inference (BST 735)
9. Define likelihood ratio, score, and Wald tests and other robust procedures (BST 735)
10. Recognize, define, and distinguish between generalized linear models, mixed models, and generalizing estimating equations (BST 760)
11. Design and implementation of repeated measures designs (BST 760)
12. Define and distinguish between numerical algorithms useful in biostatistics (BST 765)
13. Utilize randomization tests and resampling (BST 765)
14. Demonstrate a clear ability to carry out independent biostatistics research, publishable in peer-reviewed journals (BST 799)

Residence Requirement

Although there is great variation, the usual minimal period in which the doctoral degree can be earned is three academic years of full-time study. 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, doctoral students must be involved in full-time doctoral study for at least one academic year (two semesters).

PhD Qualifying Exam

Upon completion of the first year-and-a-half of course work, the candidate is given a written examination consisting of two parts - Applied Statistics and Theory of Statistics. The exam will test the students on their understanding and comprehension of the foundation of the theory and applications of statistics, and will generally cover materials from BST 621, 622, 623, 626, 631, 632 and 655. This will be a standard departmental exam, administered by the GPC. The criteria for evaluation are the candidate's understanding and competency in basic principles and foundations of biostatistics, potential for conducting independent research in statistical methods, and ability to express in writing the results of the problems. This examination is offered during the first half of January. At first attempt, a student must take both parts at the same time. For those years during which at least one student needs to take the exam a second time, the exam may be offered in July at the discretion of the GPC. Students must be registered for at least 3 semester hours of graduate work during the semester in which the comprehensive examination is given.

The student may pass each part of the exam at the PhD level, fail at the PhD level but pass at the Master's level, or fail at the Masters level. If a student fails to pass either part of the exam at the PhD level, one additional chance will be given to retake the part of the exam that was failed. A student who fails the qualifying examination more than once will be dismissed from the PhD program. The student has the opportunity to appeal the decision of his/her dismissal. Graduate School policies on dismissal from the program and appeal of dismissal are described in detail in the UAB Student Handbook.

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 the students' 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.

PhD Dissertation Research

The student should start his/her dissertation research during the second or third year of study. The initial step of the research consists of identifying a topic that is of mutual interest to the student and the research advisor. Courses, seminars, and presentations by the faculty assist the student in this process. The dissertation must be an original contribution to scientific knowledge. It can involve, but is not limited to, the development of new statistical methodologies, evaluation of existing methodologies and study of their properties, innovative application of existing methodologies, or any combination of the above. It must show a clear ability to carry out independent biostatistical research and provide results that are publishable in peer-reviewed journals.

PhD Dissertation Committee

Upon successful completion of the qualifying exam at the doctoral level and identifying a dissertation topic, the student and his/her research advisor should form a dissertation committee consisting of at least five members (including the advisor). This committee should consist of at least five graduate faculty members, two of whom should be from outside the department of biostatistics. Each member of the committee should be able to bring some relevant insight and expertise to guide the student. The research advisor serves as the chairperson of this committee. All members of the committee must have a graduate faculty appointment (adjunct, ad-hoc, or full graduate faculty status). If a faculty member from another department is asked to serve on a committee, they will need to obtain graduate faculty status (unless they already have it in their department). If a faculty member outside of UAB will serve on the committee, the department will need to request an ad-hoc appointment through the Graduate School. In either situation, the process for this includes submitting a memo requesting adjunct or ad-hoc status from the Graduate Program Director along with a current CV. Recommendations for graduate study committee members are submitted by the advisor and the student to the Graduate Program Director, who must approve the committee and submit the list to the Dean of the Graduate School for approval and formal appointment. Graduate study committee appointments are made by the Dean of the Graduate School, who is an *ex officio* member of all graduate study committees. The dissertation committee should meet periodically to monitor the student's progress during the conduct of the research.

Dissertation Proposal and PhD Oral Examination

After forming a graduate committee, the student should present and prepare a written proposal to their committee for suggestions/approval. The whole committee must approve the proposal, not just the advisor. This is to ensure that the work is novel, feasible, and significant. The word "novel" here is important. A dissertation must add to the body of knowledge in biostatistics, meaning that a careful review of the existing literature on the chosen subject is necessary. It would be very unfortunate to get to the last stages of your work and to have someone suddenly point out to you that it had already been done! During the early stages of the research, it may be useful for the student to register for readings courses (BST 798) under the direction of the research advisor. The purpose of such courses is to review the literature for the research area of interest in order to help the student formulate a research problem.

After a literature survey and a clearer definition of the scope of the proposed research under the direction of the advisor, the student must submit a written proposal and **present it orally to the dissertation committee**. The dissertation proposal is closed to the general public and should be attended only by the dissertation committee. The committee may approve unconditionally, approve conditionally, or disapprove the proposal. The oral presentation also represents the oral doctoral exam. As such, a student is expected to demonstrate a good understanding of materials relevant to the general field in which the dissertation is written. The format of the questions for the proposal is left to the discretion of the committee. The outline and the organization of the proposal must follow the graduate school requirements described in the UAB Graduate Student Handbook. The Dissertation Committee and the Graduate Program Director will recommend the student to the Graduate School Dean for admission to candidacy. The committee meeting at which candidacy is discussed must be scheduled through the Graduate School to allow the Dean to attend. If the

proposal is not approved, the student may be given only one other opportunity to re-present the proposal and it must be done within six months of the first attempt. You must be registered for at least 3 hours in the semester in which you present your project proposal to your committee.

Annual Presentation

All PhD students are required to give an oral presentation annually to the Department. This can be fulfilled through the Dissertation Proposal or Defense, or through other Departmental seminars.

Admission to Candidacy for the PhD Degree

Admission to candidacy is an important step forward in the student's pursuit of the doctorate. By this step, the dissertation committee indicates its confidence that the student is capable of completing the proposed research project and the doctoral program.

Once the student has (1) passed the qualifying exam at the doctoral level, (2) written a formal dissertation proposal, and (3) had the dissertation proposal approved by the dissertation committee as an acceptable proposal for research, the committee will recommend to the Dean of the Graduate School that the student be admitted to candidacy. This requires that the student file an "Admission to Candidacy" form with the Graduate School. A student must be in good academic standing to be admitted to candidacy. **Admission to candidacy must take place at least two semesters before the expected completion of the doctoral program.** Students must be admitted to candidacy before they can register for dissertation research hours (BST 799).

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.

Directives for the Dissertation

The results of the candidate's individual inquiry must be presented in a written dissertation comprising a genuine contribution to knowledge in the field of biostatistics. The document should also demonstrate the candidate's acquaintance with the literature. The physical form of the dissertation must comply with the regulations stated in the booklet *UAB Format Manual for Theses and Dissertations*, which is published by the Graduate School and is available online as a PDF or HTML file. The description below is intended to provide helpful information. However, students should note that any description in the Graduate Student Handbook supersedes the descriptions in this document. All PhD students should obtain a copy of the Graduate School Handbook and familiarize themselves with the content.

The dissertation research must include an original contribution to the body of knowledge in biostatistics 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, Statement of 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 (1) and (2) above should be combined and sections (3) and (4) above should be replaced with three papers of sufficient quality to be submitted to appropriate 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.

Students should attend the free seminar titled “Staying Afloat While Preparing a Thesis or Dissertation”, which is offered each semester by the Graduate School Professional Development Program. Additional assistance is available for students registered in GRD 704 (offered every semester by the Graduate School Professional Development Program).

PhD Final Exam

After the student has completed all formal requirements for the PhD degree, the dissertation committee administers the final oral examination. The final examination should take the form of a presentation and defense of the dissertation, followed by an examination of the candidate's comprehensive knowledge of the field. This examination must be scheduled through the Graduate School to allow attendance of the Dean. The defense must be announced at least 2 weeks in advance. It is the responsibility of the student to schedule the defense at a time convenient to all parties involved. **A preliminary copy of the dissertation must be submitted to the dissertation committee for approval at least two weeks prior to the defense, unless otherwise approved in advance by the dissertation committee. The meeting must be open to all interested parties, publicized on the UAB campus, published in the UAB Reporter, and must take place at least 30 days before the expected date of graduation. Candidates must be registered for at least 3 semester hours of Dissertation Research (BST 799) during the semester in which the final examination is taken.**

The dissertation committee will evaluate the student's performance in the final exam. In order for the student to pass, all of the committee or all but one member of the committee must pass the student in the final exam. Upon approval by the committee and the Graduate Program Director, the result of the final exam should be forwarded to the Graduate School Dean for approval. Final copies of the dissertation after final approval of the committee, including any changes required by the committee, must be submitted to the Dean within two weeks following successful completion of the defense. Please see the Graduate Student Handbook for various deadlines and further details. Upon satisfying all requirements, the dissertation committee and the Graduate Program Director will recommend the student to the Graduate School Dean for the doctoral degree.

No later than 10 business days following your public defense, submit one corrected copy of your finished manuscript as a PDF file, your signed approval forms and all additional applicable forms to Jan Baird in the graduate school (HUC 511) for review. If you are reprinting a published article, you must also submit permission to reprint from the copyright holder. You do not need to make an appointment. You will be notified when the document review is completed (usually within 2-3 days of submission). Your manuscript will be reviewed for adherence to format requirements and consistency in style throughout the document.

Summary of Steps to the PhD

- Step 1. The student must successfully complete all of the masters' level core courses.
- Step 2. The student must pass the qualifying exam at the doctoral level.
- Step 3. The student must successfully complete all of the doctoral level core courses.
- Step 4. When the required coursework is near completion, the student should identify a research advisor and begin to prepare a formal, written proposal for his/her dissertation research.
- Step 5. The advisor and student should nominate a Graduate Committee, with an eye towards choosing the appropriate people to help guide the dissertation research.
- Step 6. IRB approvals obtained (if necessary)

- Step 7. The student should prepare and present a written proposal.
- Step 8. Admission to candidacy – no later than two semesters before expected graduation. This admission to candidacy gives the student permission to pursue the research. Note that steps 1-7 must be completed before the student can be admitted to candidacy – no exceptions.
- Step 9. The student should work with appropriate committee members, taking advantage of their varied expertise as needed. There should be intermediate meetings and progress reports.
By the time of the dissertation defense, neither the student nor the committee should find any surprises.
- Step 10. Application for degree – no later than 3 weeks into the expected semester of graduation.
- Step 11. Final examination – no later than 30 days before expected graduation
- Step 12. Submit one PDF copy of defended committee-approved version of thesis to Graduate School Office – no later than 10 days following the public defense

PhD students are generally expected to complete all degree requirements within **7 years of matriculation**. One extension of this time limit can be requested when mitigating circumstances preclude completion of the requirements within 7 years. The recommendation for an extension should include a plan and timeline for completion. Such requests require the approval of the 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 7 years before graduation may not be applied towards the degree without the approval of the Graduate Program Director and Dean of the Graduate School.

Frequently Asked Questions

If there are more than five members on the committee, do they all have to sign off on the final defense?

Officially, the student only needs five committee members. The student could have additional committee members present but the official committee would only consist of those faculty members that were submitted on the official *Graduate Committee Letter* to the Graduate School Dean. As a result, only those five would appear on the approval forms to be signed by the committee.

Do faculty members have to be physically present at the proposal or defense (i.e., can they participate via phone)?

It is highly preferred that all faculty members be present at the defense.

Can a student include a faculty member at another institution on their committee?

Yes. The department will need to request an ad-hoc appointment through the Graduate School. The process for this includes submitting a memo requesting ad-hoc status from the Graduate Program Director and a current CV.

CERTIFICATE IN STATISTICAL GENETICS

Program Objectives

The purpose of the Certificate in Statistical Genetics (C.S.G.) is to offer recognition that certain graduate students have completed specific requirements above and beyond those ordinarily completed by graduate students receiving degrees in biostatistics and to recognize that completion of those requirements offers them particular expertise in statistical genetics. By offering a C.S.G., we are able to offer students an incentive to complete additional demanding work in statistical genetics as well as to offer graduates from our program an additional benefit that will make them more competitive in the market place.

Program Content & Relation to Other UAB Programs

C.S.G. enrollees must either: (a) Be enrolled as a matriculated student in the Department of Biostatistics PhD Program; or (b) Already have a doctoral degree in statistics or biostatistics; or (c) Have a doctoral degree in another discipline and be judged by a committee appointed by the Head of the SSG and consisting of 3 faculty members in the SSG to be capable of performing as a statistician at the level of a doctoral level academic statistician. By this we mean a competent faculty-level research scientist with the ability to utilize and interpret cutting edge statistical methods.

Candidates for the C.S.G. will be required to successfully complete (i.e., achieve a grade of 'B' or better) the following courses:

BST 675	Introduction to Statistical Genetics	3 Credit hours
EPI 730	Introduction to Human Population Genetics Theory	3 Credit hours
BST 676	Genomic Data Analysis	3 Credit hours
BST 775	Statistical Methods for Genetic Analysis I	3 Credit hours
BST 776	Statistical Methods for Genetic Analysis II	3 Credit hours

Regarding the sequence in which the courses are taken, the optimal sequence will be determined by the candidate's academic or research advisor within the Department of Biostatistics from within the range of options that are allowable by University, School, and Department policies. For any C.S.G. candidates that do not have an advisor assigned within the Biostatistics Department, the Head of the SSG will take responsibility for assigning a C.S.G. mentor to that person from among the SSG faculty.

In addition to the courses above, C.S.G. recipients who are enrolled as a matriculated student in the Department of Biostatistics PhD program must also successfully complete all requirements for the PhD in Biostatistics at UAB. Those seeking the C.S.G. who already have a doctoral degree but do not have the necessary pre-requisites for the required courses, must either take the prerequisites or must get permission from the course instructor. Up to 6 credit hours (2 courses) from among the 5 C.S.G.-required courses may be waived if the C.S.G. candidate has demonstrated expertise in those areas. The waiver of courses must be approved by the committee overseeing the C.S.G. Program, appointed by the Head of the SSG. Note that none of the C.S.G.-required courses are courses that are required for completion of a PhD in the Biostatistics Department.

Post-doctoral fellows in the SSG have the option (but not the mandate) to obtain the certificate by completing the above requirements.

FACULTY AND RESEARCH INTERESTS

Faculty and students in the Department of Biostatistics are involved in activities relating to the development of statistical theory and in the application of statistical methods to the analysis of data collected in many different experimental situations. Much of the department's research is collaborative in nature, involving participants from basic science, clinical medicine, public health, and other areas both within and outside UAB. Faculty in the department are actively involved in the development of grant proposals in fields of general statistics, statistical genetics, and other collaborative research areas.

Faculty

Professors (4): Cutter, Fineberg, Howard, Tiwari

Associate Professors (9): Aban, Beasley, Cofield, Liu, Lou, McClure, Redden, Yi, K. Zhang

Assistant Professors (9): Cui, de los Campos, , Judd, Kennedy, Morgan, Szychowski, Vaughan, X. Zhang, Zhi

Emeritus Professors (2): Bartolucci, Katholi

Inmaculada (Chichi) Aban, Ph.D. (Bowling Green State), Associate Professor. *Clinical Trials, Model Diagnostics, Survival and Reliability Analysis, Inference for Heavy Tailed Distributions.*

Alfred A. Bartolucci, Ph.D. (SUNY, Buffalo), Professor Emeritus. *Clinical Trials, Survival Analysis, Bayesian Statistics, Longitudinal Data Analysis.*

T. Mark Beasley, Ph.D. (Southern Illinois - Carbondale), Associate Professor. *Linear Models, Linkage and Association with Quantitative Traits, Nonparametric Methods, Microarray Analysis.*

Stacey S. Cofield, Ph.D. (Virginia Commonwealth), Associate Professor. *Mixed-Effects Models, Clinical Trial Design, Management, and Analysis, Out-of-Hospital Cardiac Arrest and Resuscitation.*

Xiangqin Cui, Ph.D. (Iowa State), Assistant Professor. *Microarray Analysis, Quantitative Trait Locus Analysis.*

Gary Cutter, Ph.D. (Texas Health Science Center - Houston), Professor and Head of the Section on Research Methods and Clinical Trials. *Clinical Trials and Community Studies Trial Analyses, Chronic Disease Epidemiology, Large Scale Data Bases, Multiple Sclerosis, Myasthenia Gravis and Neonatal Trials, Behavioral Studies.*

Gustavo de los Campos, Ph.D. (University of Wisconsin-Madison). Assistant Professor, Section on Statistical Genetics. *Quantitative Genetics, Statistical Learning and Prediction, Semi-parametric and Bayesian Methods.*

Naomi Fineberg, Ph.D. (Boston University), Research Professor and Chair. *Small Medical Studies.*

George Howard, DrPH (North Carolina), Professor. *Design and Analysis of Multi-center Clinical Trials, Application of Statistical Methods in Epidemiological Studies, Linear Models.*

Suzanne E Judd, Ph.D. (Emory), Research Assistant Professor. *Vitamin D, Longitudinal Cohort Studies, Cystic Fibrosis and Bone Health, Data Management.*

Charles R. Katholi, Ph.D. (Adelphi), Professor Emeritus. *Computationally Intensive Statistical Methods, Large Sample Theory, Use of Asymptotic Tests in the Presence of Small Samples, Estimation and Testing Infection Potential by Pool Screening.*

Richard Kennedy, Ph.D. (Virginia Commonwealth University), Assistant Professor. *Longitudinal data modeling, cognitive function, clinical trials simulations, gene expression analysis.*

Nianjun Liu, Ph.D. (Yale), Associate Professor. *Genetic Linkage and Association Analysis, Disequilibrium Mapping, Population Genetics, Bioinformatics, Machine Learning Methods and Longitudinal Data Analysis and Their Applications in Genetics and Bioinformatics.*

Xiang-Yang Lou, Ph.D. (Zhejiang), Associate Professor. *Linkage and Association Analysis, Gene-Gene and Gene-Environment Detection, Bioinformatics, Population Genetics, Computational Biology.*

Leslie Ain McClure, Ph.D. (Michigan), Associate Professor and Director of Graduate Studies. *Clinical Trials with Multiple Outcomes, Interim Analysis.*

Charity Morgan, Ph.D. (Harvard University), Assistant Professor. *Finite Mixture Models. Bayesian Data Analysis. Multiple Sclerosis. Psychopathology.*

David T. Redden, Ph.D. (Alabama), Associate Professor. *Regression Diagnostics, Admixture, Association Studies.*

Jeffery Szychowski, Ph.D. (Alabama), Assistant Professor. *Clinical Trials, Maternal and Fetal Medicine Studies, Regression Analysis and Smoothing Methods, Categorical Data Analysis, Survival Analysis.*

Hemant K. Tiwari, Ph.D. (Notre Dame), Professor and Head of the Section on Statistical Genetics. *Genetic Linkage and Association Analysis, Haplotype Analysis, Disequilibrium Mapping, Population Genetics, Molecular Evolution, Bioinformatics.*

Laura Kelly Vaughan, Ph.D. (Texas A&M), Research Assistant Professor. *Genetic Linkage and Association Studies, Population Stratification, Bioinformatics.*

Nengjun Yi, Ph.D. (Zhejiang), Associate Professor. *Statistical Genetics/Genomics, Bayesian Statistics, MCMC Algorithms.*

Kui Zhang, Ph.D. (Peking), Associate Professor. *Statistical Methods for Molecular Biology and Genetics, Linkage and Disequilibrium Analysis, Functional Genomics.*

Xiao Zhang, Ph.D. (UCLA), Research Assistant Professor. *Bayesian Computation, Clinical Trials.*

Degui Zhi, Ph.D. (UCSD), Assistant Professor. *Protein Sequence and Structure Analysis, Bioinformatics, Next-generation Sequencing Data Analysis.*

BIOSTATISTICS COURSES

BST 603 – Introductory Biostatistics for Graduate Biomedical Sciences. This course will provide non-biostatistics students seeking a Graduate Biomedical Sciences (GBS) degree with the ability to understand introductory biostatistics concepts. 3 hours. As needed.

BST 611 - Intermediate Statistical Analysis I. Students will gain a thorough understanding of basic analysis methods, elementary concepts, statistical models and applications of probability, commonly used sampling distributions, parametric and non-parametric one and two sample tests, confidence intervals, applications of analysis of two-way contingency table data, simple linear regression, and simple analysis of variance. Students are taught to conduct the relevant analysis using current software such as the Statistical Analysis System (SAS). 3 hours. Fall/Spring.

BST 612 - Intermediate Statistical Analysis II. This course will introduce students to the basic principle of tools of simple and multiple regression. A major goal is to establish a firm foundation in the discipline upon which the applications of statistical and epidemiologic inference will be built. Prerequisite: BST 611 or Permission of Instructor. 3 hours. Spring/Summer.

BST 613. Intermediate Statistical Analysis III. Continuation of concepts in BST 611/612, intended to introduce students to additional general concepts in biostatistics beyond an introductory level. The course will include a broad overview of three areas: 1) categorical, ordinal, and count methods with proportional odds model and Poisson regression; 2) survival analysis and event outcome data with Kaplan-Meier, proportional hazards, and repeated events; 3) repeated measures, mixed models, hierarchical modeling for longitudinal and missing data. Study design, analysis interpretation of results, power and sample size estimation, and non-parametric alternatives will be presented for all topic areas. Prerequisite: BST 612. 3 hours. Fall.

BST 619 - Data Collection and Management. Basic concepts of study design, forms design, quality control, data entry, data management, and data analysis. Hands-on experience with data entry systems (e.g., DBASE) and data analysis software (SAS). Exposure to other software packages as time permits. Prerequisites: BST 611; Previous computer experience or workshop on microcomputers highly recommended. 3 hours. Spring.

BST 620 - Applied Matrix Analysis. Vector and matrix definitions and fundamental concepts; matrix factorization and application. Eigenvalues and eigenvectors, functions of matrices, singular and ill-conditioned problems. Prerequisites: BST 622. 3 hours. As needed.

BST 621 - Statistical Methods I. Mathematically rigorous coverage of applications of statistical techniques designed for Biostatistics majors and others with sufficient mathematical background. Statistical models and applications of probability; commonly used sampling distributions; parametric and nonparametric one and two sample tests and confidence intervals; analysis of contingency tables; simple linear regression and analysis of variance. Prerequisites: A year of calculus and linear algebra. 3 hours. Fall.

BST 622 - Statistical Methods II. Continuation of concepts in BST 621, extended to multiple linear regression; analysis of variance, analysis of covariance, multiple analysis of variance; use of contrasts and multiple comparisons procedures; simple and multiple logistic regression, and an introduction to survival analysis. Prerequisites: BST 621. 3 hours. Spring.

BST 623 - General Linear Models. Simple and multiple regression using matrix approach; weighted and nonlinear regression; variable selection methods; modeling techniques; regression diagnostics and model validation; systems of linear equations; factorial designs; blocking; an introduction to repeated measures designs; coding schemes. Prerequisite: BST 622. 3 hours. Fall.

BST 624 - Experimental Designs. Intermediate experimental design and analysis of variance models using matrix approach. Factorial and nested (hierarchical) designs; blocking; repeated measures designs; Latin squares; incomplete block designs; fractional factorials; confounding. Prerequisites: Matrix algebra and BST 623. 3 hours. As needed.

BST 625 - Design and Conduct of Clinical Trials. Concepts of clinical trials; purpose, design, implementation, and evaluation. Examples and controversies presented. Prerequisite: BST 611 and 612 or permission of the instructor. Pass/No Pass. 3 hours. Summer.

BST 626/626L - Data Management/Reporting with SAS. A hands-on exposure to data management and report generation with one of the most popular statistical software packages. Concurrent registration in BST 626 and BST 626L is required. 3 hours. Fall.

BST 631 – Statistical Theory I. Fundamentals of probability; conditional probability and independence; distribution, density, and mass functions; random variables; moments and moment generating functions; discrete and continuous distributions; exponential families, joint, marginal, and conditional distributions; transformation and change of variables; convergence concepts; sampling distributions; order statistics; random number generation. Prerequisite: Advanced calculus. 4 hours. Fall.

BST 632 - Statistical Theory II. Point interval estimation; sufficiency and completeness; ancillary statistics; maximum likelihood and moment estimators; best unbiased estimator; hypothesis and significance testing; likelihood ratio tests and uniformly most powerful tests; confidence interval estimation; asymptotic properties of estimators and tests; introduction to Bayesian inference. Prerequisite: BST 631. 4 hours. Spring.

BST 640 - Nonparametric Methods. Properties of statistical tests; order statistics and theory of extremes; median tests; goodness of fit; tests based on ranks; location and scale parameter estimation; confidence intervals; association analysis; power and efficiency. Prerequisite: BST 622, BST 632. 3 hours. As needed.

BST 655 - Categorical Data Analysis. Intermediate level course with emphasis on understanding the discrete probability distributions and the correct application of methods to analyze data generated by discrete probability distributions. The course covers contingency tables, Mantel-Haenszel test, measures of association and of agreement, logistic regression models, regression diagnostics, proportional odds, ordinal and polytomous logistic regression, Poisson regression, log linear models, analysis of matched pairs, and repeated categorical data. Prerequisite: BST 622 or equivalent recommended. 3 hours. Fall.

BST 660 - Applied Multivariate Analysis. Analysis and interpretation of multivariate general linear models including multivariate regression, multivariate analysis of variance/covariance, discriminant analysis, multivariate analysis of repeated measures, canonical correlation, and longitudinal data analysis for general and generalized linear models. Extensive use of SAS, SPSS, and other statistical software. Prerequisite: BST 623. 3 hours. As needed.

BST 661 - Structural Equation Modeling. Basic principles of measurements; factor analysis and latent variable models; multivariate predictive models including mediation mechanisms and moderator effects; path analysis; integrative multivariate covariance models, methods of longitudinal analysis. Prerequisite: BST 623. 3 hours. As needed.

BST 665 - Survival Analysis. Kaplan-Meier estimation; Parametric survival models; Cox proportional hazards regression models; sample size calculation for survival models; competing risks models; multiple events models. Prerequisite: BST 622. 3 hours.

BST 670 - Sampling Methods. Simple random, stratified, cluster, ratio regression and systematic sampling; sampling with equal or unequal probabilities of selection; optimization; properties of estimators; non-sampling errors; sampling schemes used in population research; methods of implementation and analyses associated with various schemes. Prerequisite: BST 631. 3 hours. As needed.

BST 671 - Meta Analysis. Statistical methods and inference through meta analysis. Prerequisites: BST 623, BST 632. 3 hours. As needed.

BST 675 - Introduction to Statistical Genetics. This class will introduce students to population genetics, genetic epidemiology, microarray and proteomics analysis, Mendelian laws, inheritance, heritability, test cross linkage analysis, QTL analysis, human linkage and human association methods for discrete and quantitative traits. Prerequisite: BST 611 or BST 621. 3 hours. Spring (odd years).

BST 676 – Genomic Data Analysis. The purpose of this class will be to teach graduate students statistics methods that underlie the analysis of data generated by high throughput genomic technologies, as well as issues in the experimental design and implementation of these technologies. High throughput technologies that will be covered include microarrays, proteomics, and second generation sequencing. Prerequisites: BST 611 or 621. BST 675 recommended. 3 hours. Spring (even years).

BST 691 – Biostatistics Pre-doctoral Seminar Series. This course provides an opportunity for students to learn about ongoing research in the field of biostatistics, clinical trials, and statistical genetics. Reserved for BST students. Pass/No Pass. 1 hour. Fall/Spring.

BST 695 - Special Topics. This course is designed to cover special topics in Biostatistics that are not covered in regular 600 level courses, but suited for Masters students in Biostatistics and doctoral students in other related disciplines. 1 - 3 hours

BST 697 - Internship. Pass/No Pass. 1-6 hours

BST 698 - Non-Thesis Research. Pass/No Pass. 1-6 hours

BST 699 - Master's Thesis Research. Prerequisite: Admission to candidacy for MS degree. Pass/No Pass. 1 - 12 hours.

BST 723 - Theory of Linear Models. Multivariate normal distributions and quadratic forms; least square estimation; nested models; weighted least squares, testing contrasts; multiple comparisons; polynomial regression; maximum likelihood theory of log-linear models. Prerequisite: BST 632. 3 hours. Fall (odd years).

BST 725 - Advanced Clinical Trials I. This course will provide students with a basic understanding of the fundamental statistical principles involved in the design and conduct of clinical trials. Important topics of discussion will include data management, quality assurance, endpoints, power analysis, interim analysis, adaptive designs, and genetic issues in clinical trials. Prerequisites: BST 611, 612 and 625. 3 hours. Fall (even years).

BST 726 - Advanced Clinical Trials II. This course builds on the knowledge gained in BST 725 in order to develop a more thorough understanding of the basic methodology behind power analysis, interim data monitoring, and analysis of missing data. The class will involve discussions of recent publications dealing with current topics of interest in clinical trials. Each student will also be asked to conduct, summarize, and present a course project based on a more in-depth exploration of one of the topics introduced in the BST 725 course. Prerequisites: BST 621, 622, 625, 631, 632 and 725. 3 hours. Spring (odd years).

BST 735 - Advanced Inference. Stochastic convergence and fundamental inequalities; weak convergence and the central limit theorems; large sample behavior of the empirical distribution and order statistics; asymptotic behavior of estimators and tests with particular attention to LR, score, and Wald tests. Prerequisites: BST 631 and 632. 3 hours. Spring (odd years).

BST 740 - Bayesian Analysis. To introduce the student to the basic principles and tools of Bayesian Statistics and most importantly to Bayesian data analysis techniques. A major goal is to establish a firm foundation in the discipline upon which the applications of statistical and epidemiologic inference will be built. The practical part of the course will be based on Bugs (either WinBugs or OpenBugs), possibly accessed through R with the existing tools for the interface (R packages: R2WinBugs or BRugs, coda). This will enable participants to take the practical examples all the way to the reporting stage in terms of tabulations and graphics. Prerequisites: BST 632. 3 hours. Fall (even years).

BST 741 – Advanced Bayesian Analysis II. To illustrate advanced approaches to Bayesian modeling and computation in statistics. We begin with a brief description of the basic principle and concepts of Bayesian statistics. We then study advanced tools in Bayesian modeling and computation. A variety of models are covered, including multilevel/hierarchical linear and generalized linear models, models for robust inference, mixture models, multivariate models, nonlinear models, missing data, and Bayesian model selection. We also introduce some applied areas of modern Bayesian methods, such as genetics/genomics and clinical trials. The practical part of the course will be based on Bugs (either WinBugs or OpenBugs), possibly accessed through R with the existing tools for the interface (R packages: R2WinBUGS or BRugs, coda). This will enable participants to take the practical examples all the way to the reporting stage in terms of tabulations, graphics etc. Prerequisites: BST 631 and 632. BST740 would be helpful but not absolutely required. 3 hours. Fall (odd years).

BST 750 - Stochastic Modeling. Poisson processes; random walks; simple diffusion and branching processes; recurrent events; Markov chains in discrete and continuous time; birth and death process; queuing systems; applications to survival and other biomedical models. Prerequisite: BST 632. 3 hours. As needed.

BST 760 - Generalized Linear and Mixed Models. Generalized linear models; mixed models; and generalized estimating equations. Prerequisite: BST 723. 3 hours. Spring (even years).

BST 765 - Advanced Computational Methods. Numerical algorithms useful in biostatistics including likelihood maximization using the Newton-Raphson method, EM algorithm, numerical integration using quadratic and Monte-Carlo methods, interpolation using splines, random variate generation methods, data augmentation algorithm, and MCMC and Metropolis-Hastings algorithm; randomization tests; resampling plans including bootstrap and jackknife. Prerequisites: BST 632. 3 hours. Fall (even years).

BST 775 - Statistical Methods for Genetic Analysis I. This course will provide a statistical basis for describing variation in qualitative (disease) and quantitative traits. This will include decomposition of trait variation into components representing genes, environment and gene-environment interaction. Resemblance between relatives and heritability will be described. Important topics of discussion will include oligogenic and polygenic traits, complex segregations analysis, methods of mapping and characterizing simple and complex trait loci. Prerequisites: BST 623, BST 632, and BST 675. It is assumed that students are comfortable with regression theory, covariance, correlation, and likelihood theory. Interested students are urged to contact the instructors with concerns regarding assumed knowledge. 3 hours. Fall (odd years).

BST 776 - Statistical Methods for Genetic Analysis II. This course builds on the knowledge gained in BST 775 with rigorous mathematical and statistical treatment of methods for localizing genes and environmental effects involved in the etiology of complex traits using case-control and pedigree data. Prerequisites: BST 775; Knowledge of SAS and programming languages such as C++, and basic knowledge of multivariate methods and Markov chain theory is highly recommended. 3 hours. Spring (even years).

BST 793 – Biostatistics Post-doctoral Seminar Series. This course provides an opportunity for post-doctoral students to learn about ongoing research in the field of biostatistics, clinical trials, and statistical genetics. Reserved for BST Postdoctoral students. Pass/No Pass. 3 hours. Fall/Spring.

BST 795 - Advanced Special Topics. This course is designed to cover advanced special topics in Biostatistics that are not covered in regular 700 level courses, but suited for doctoral students in Biostatistics. Prerequisites: BST 622 and 632. Pass/No Pass. 1-3 hours

BST 798 - Non-Dissertation Research. Pass/No Pass. 1-6 hours

BST 799 - Doctoral Dissertation Research. Prerequisite: Admission to candidacy for Ph.D. Pass/No Pass. 1-12 hours.

ONLINE FORMS

All forms listed below can be found at the following web link from the graduate school website:
<http://www.uab.edu/graduate/online-forms>.

FORMS USED FOR ADMISSIONS

Apply for Graduate School Online

Take a few moments to create an account, and you can start your application to a degree-granting program today!

Nondegree Application

Students who are not enrolled in a degree-granting program but need academic credit for graduate courses must fill out this form.

Prospective Graduate Student Information

Use this form to request information about graduate programs.

Request to Defer Admission

Complete this form if you have been admitted to a graduate program but are unable to enroll for the admitted term.

Letters of Recommendation / Evaluation Forms

These forms are used by third parties to evaluate your potential for graduate study.

Financial Support Form

This form is used by sponsors of international students to indicate levels of financial support.

Nondegree Continuation Form

The Nondegree application remains valid for one year from the date of admission. Students can use this form to continue receiving academic credit for courses taken while not in a degree-granting program. Note that if more than one year elapses before the continuation form is filed, the nondegree application fee must be paid again.

Request for Transfer of Graduate Credit

To have academic credits transferred to UAB, this form must be filled out and transcripts must be sent from the transferring institution.

Immunization Policy

Form required for all first-time entering students enrolled in courses on UAB's campus.

Waiver of Accident and Sickness Insurance Plan

Use this form if you already have major medical insurance other than Viva Health student plan.

Request for Undergraduate Student Enrollment in Graduate Level Coursework

Undergraduate students must use this form before they can register for 500, 600, or 700 level courses.

Cooperative Admission Form

Request for expedited cooperative admission for students participating in cooperative graduate degree programs.

Permission to Audit Graduate Level Coursework

Use this form to audit a graduate course.

Change of Residency Form

Application used for reclassification of residency for tuition purposes.

FORMS USED DURING GRADUATE STUDY

Leave of Absence

Form used to request absence from a program. The absence is not to exceed one academic year.

Change of Graduate Program

Once enrolled in a degree-granting program, students must fill out this form if they want to change to another program.

Application for Readmission to the Graduate Degree Program

(\$30 fee) You can use this form if you were admitted to a UAB graduate degree program within the last five years, have not registered for one or more years, and now wish to apply for readmission to the same program.

FORMS USED TO COMPLETE GRADUATE STUDY

Graduate Study Committee Letter

This form is used to nominate the chairperson and members of a student's Graduate Study Committee.

Change of Graduate Study Committee

Once formed, the committee can be changed by filling out this form and having the change approved.

Graduation Change of Address

Your diploma will be mailed to the address listed on your "Application for Degree" form. To change this address, you must notify Lynn Bryant either by completing this form and returning it to her at Hill University Center 511, 1400 University Boulevard, Birmingham, AL 35294-1150 or emailing her at: lynnb@uab.edu.

Application for Degree

(\$50 fee) The application for degree must be turned in no later than three weeks into classes in the semester that graduation is expected. If graduation does not occur in that semester, another application for degree must be completed and a reorder fee of \$25 paid. (Approval forms cannot be completed until this 'Application for Degree' has been submitted to the graduate school)

Application for Admission to Candidacy

NOTE: A Graduate Study Committee must be appointed and approved by the Dean of the Graduate School before any student may be admitted to candidacy. No student will be admitted to candidacy if the research involves human or animal subjects and approval from the IRB or IACUC, respectively, is not documented.

Request Thesis or Dissertation Approval Forms

No later than 2 weeks before your public defense, submit this form requesting your approval forms. Approval forms cannot be completed before the graduate school has received your application for

degree. The committee members on your approval forms must exactly match those on your official records. If any member of your committee has changed, that change must be submitted on an official 'Change of Graduate Study Committee' form before your request your approval forms.

Survey of Earned Doctorates

All students completing a doctoral degree are required to fill out and submit this survey, *which is used nationally to collect data on higher education.*

ProQuest Information and Learning

Publishing your graduate work with UMI Dissertation Publishing.

Commencement Form

Doctoral students must complete and submit this form at least one month before graduation.

OTHER FORMS

Graduate Faculty Appointment Form

Graduate program directors use these forms in nominations for Graduate Faculty status.

Graduate School Appeals Board

Students who are the subject of disciplinary action may appeal their case to the Graduate School Appeals Board. This is the appeal board for disciplinary action, not for academic requests such as waiving fees or changing grades.

Academic Appeal Form

Use this form to request exception to the policies for registration, withdrawal, or payment deadlines or fees.

Nondegree Admission

Check Admission Status