PhD: BIOSTATISTICS

Biostatistics is the science that applies statistical theory and methods to the solution of problems in the biological and health sciences. A few examples of research questions which biostatistics can help answer are: What mathematical models can describe transmission and infection probabilities of infectious diseases such as AIDS and influenza? What are the risk factors associated with breast cancer? What preventive steps can people take to reduce the risk of heart disease? How many IV drug users have contracted AIDS in Georgia?

The main areas of effort for biostatisticians include collaborative research and consulting, methodological research, and education. In collaborative research, biostatisticians work on research studies with experts in the biological and health sciences. The biostatisticians' responsibilities include analysis of data and interpretation of results. Equally important, however, is the responsibility to assist in the planning and conduct of the study to ensure consistency with good statistical practice. Methodological research, such as developing mathematical models to describe biological phenomena, is conducted to enhance the existing bodies of knowledge in theoretical and applied biostatistics. Biostatisticians educate others about biostatistics through the teaching of graduate and continuing education courses, seminars, collaborative research and consulting activities.

The Ph.D program in Biostatistics prepares students for research careers by offering a blend of theoretical and methodogical courses. Our teaching curriculum is based on the principle that almost every biostatistician will have to spend at least some of his/her time on statistical analysis of real-life data. Therefore, we prepare our students to be familiar with a variety of statistical methods and approaches by exposing them to real-life problems through consulting activities and internships.

Emory's Biostatistics PhD program offers students an exciting range of challenging research projects as well as possible career opportunities. Biostatistics faculty collaborate with researchers in a variety of disciplines, developing, and applying statistical methodology in search of solutions to medical and public health problems. They have ties with many affiliates both within Emory and the broader health research community. These affiliates include, the Emory School of Medicine, Grady Memorial Hospital, Wesley Woods Geriatric Hospital, the Atlanta's Veteran's Administration Center. The U.S. Centers for Disease Control and Prevention (CDC), and various branches of National Institutes of Health. Specific research dissertation topics cover a broad range of issues and methodologies such as Composite Conditional Likelihood, Flexible Association Methods for Bivariate Survival Data, Statistical Approaches for Exploring Brain Connectivity with Multimodal Neuroimaging Data, and Methods for Estimating the Effect of Air Pollution on Asthma under a Changing Climate.

Employment prospects for PhD level biostatisticians have been excellent in recent years. Positions as researchers and data analysts are commonly available in industry (e.g., pharmaceutical, consulting), academia (e.g., schools of public health and schools of medicine) and government agencies (e.g., the Centers for Disease Control and Prevention, local or state health departments).

Admission Requirements

A baccalaureate degree from an accredited college or university is required for admission into the PhD program. The program is designed for people with **strong quantitative skills** and a background or interest in biological, medical, or health sciences. **Successful completion of multivariate calculus (Calculus III) and a course in linear algebra with a grade of B+ or better are required for admission.** Applicants must submit GRE scores unless they have a doctoral degree in a comparable field from a US institution. Scores for all sections of the GRE must be above the 50th percentile with a GPA of 3.5 or higher. International applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL) with a score of 95 or higher.

PhD in Biostatistics Curriculum

The curriculum for each student is tailored to his or her background and interests. Students can enter the PhD program with a bachelor's or master's degree. PhD students may obtain a MS degree by satisfying specific conditions during their studies.

Course No	Title	Credits
BIOS 506	Biostatistical Methods I	4
BIOS 507	Applied Linear Models	4
BIOS 508	Introduction to Categorical Data Analysis	2
BIOS 512	Probability Theory I	4
BIOS 511	Statistical Inference I	4
BIOS 522	Survival Analysis Methods	2
BIOS 709	Generalized Linear Models	4
BIOS 707	Advanced Linear Models	4
BIOS 710	Probability Theory II	4
BIOS 711	Statistical Inference II	4
BIOS 701	Public Health Research: Discovery to Practice	1
BIOS 745R	Biostatistical Consulting	1
BIOS 777	How to Teach Biostatistics	1
BIOS 780R	Advanced PhD Seminar	1
BIOS 795R	Pre-Candidacy Research	VC
BIOS 799R	Dissertation	VC
BIOS Electives		12
Non-BIOS Electives		6
Total		54

Electives: All students are required to complete 12 credits of elective courses in biostatistics; at least 6 of these credits must be in 700-level courses. Enrollment in the invited speakers seminar series (BIOS 790R) is required for the first two years of coursework in which only 2 credit hours will count toward elective hours. In addition, students are required to complete 6 credits of elective courses (at the 300-level or above) outside of biostatistics; at least 2 of these credit hours must be in epidemiology for students who lack prior training in epidemiology. Students must maintain an average GPA of at least B- and a minimum of 51 credits must be taken as graded.

BIOS 701: All students are required to have training in public health. The primary means to obtain this knowledge is through BIOS 701: Translational Public Health Research (1 credit hour) which is taken Fall semester of your first year. This course prepares students to understand the language and approaches of several disciplines comprising the field of public health (in academia and practice), thereby fostering greater potential for collaboration and improvement in population

For further information on the PhD in Biostatistics, please refer to
https://www.sph.emory.edu/departments/bios/degree-programs/phd/index.html

To apply, please refer to http://www.gs.emory.edu/admissions/application.html

If you have any questions, please contact Melissa Sherrer, M.Ed, Associate Director of Academic Programs, at msherre@emory.edu or 404-727-3968.