

## VANDERBILT UNIVERSITY SCHOOL OF MEDICINE

Department of Biostatistics Graduate Program  
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**VANDERBILT**<sup>®</sup>  
School of Medicine

Graduate Program in  
**Biostatistics**

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# Pioneering Statistical Education in Biomedical Sciences

**Biostatistics is the branch of statistics responsible for the proper interpretation of scientific data generated in the biomedical and public health sciences. Quantitative reasoning and data interpretation are now essential scientific skills; experts in these techniques are in wide demand.**

The Department of Biostatistics at Vanderbilt University is proud to offer a modern, re-envisioned graduate program in Biostatistics. The curriculum is nondenominational with respect to the foundations of statistical inference and modern in its treatment of statistical principles. Likelihood, Bayesian, and Frequentist viewpoints are integrated throughout the curriculum. Advanced computational training and a thoughtful integration of theory and methods equip graduates for careers in academics, industry, or government.

The Graduate Program fosters an active learning environment, rich in intellectual challenges and dedicated mentorship. Students are trained to be statistical scientists who draw on a strong foundation in statistical inference, methodological proficiency, and computing aptitude. Communication and presentation skills are emphasized along with the fundamentals of reproducible research. Students are involved in mentored biomedical research early in their graduate career.

The Department of Biostatistics at Vanderbilt was founded in 2003 and is located in Nashville, Tennessee: a vibrant and rapidly growing city. Yu Shyr, PhD is the current chair of the department. The department has 45 nationally recognized faculty, 40 staff biostatisticians, bioinformaticians and data scientists, 11 application developers, and 37 students. The department engages in collaborative relationships with over 20 departments and centers in the School of Medicine.

## Course of Study

### MS PROGRAM

The Masters' Program provides a solid theoretical foundation, broad methodological training, and extensive computing experience. It includes at least 45 semester credit hours of didactic learning and mentored thesis project. The program is expected to take 2 years to complete.

### PHD PROGRAM

The PhD program provides a comprehensive theoretical foundation, specialized training in methodology and computation, and the cultivation of research skills. The PhD program includes at least 72 semester credit hours of didactic learning and mentored research. The program is expected to take 4-6 years to complete.

### CURRICULUM

Emphasizes theory, applications, critical thinking, communication, and computing in areas such as statistical and probability theory, foundations of statistical inference, regression methodology, learning algorithms, advanced computing, consulting, epidemiologic methods, and clinical trials (among other electives). Effective communication and presentation skills are constantly reinforced.

### APPRENTICING

The PhD program uses an apprenticeship model to develop and refine critical thinking and research skills through mentored research experiences, research assistantships, and teaching assistantships. Both programs have structured mentorship opportunities: in-class projects, a self-selected interdisciplinary research rotation, summer book clubs, working groups, and seminars.

## Application & Funding

Prospective students may apply for the PhD and MS program in the fall semester of each academic year. The program is highly selective, taking on average, only 4 PhD and 4 MS students per year. All PhD admissions include a full tuition waiver, 12-month stipend, and health insurance. All MS admissions include, at a minimum, an 80% tuition waiver.

In addition to statistics and mathematics, candidates should have an interest in the quantitative aspects of public health, clinical trials, biomedicine, bioinformatics, genetics, or biology. The ideal candidate is excited to collaborate with biomedical or public health scientists.

### REQUIREMENTS

Applicants must hold a bachelor's degree, have taken three semesters of college calculus (through multivariable calculus), one semester of linear algebra, and at least one class in statistics. Students must submit a résumé/CV, statement of purpose detailing their interest in biostatistics, transcripts, GRE scores, and three letters of recommendation. Prospective applicants are encouraged to highlight their quantitative and analytical potential as well as their communication skills. TOEFL scores are required for all international students who do not have a degree from a U.S. institution of higher learning.

Complete an online application at:  
<https://apply.vanderbilt.edu/apply>

For more information visit:  
[vanderbilt.edu/biostatistics/graduate](http://vanderbilt.edu/biostatistics/graduate)

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## Faculty Areas of Interest

Bayesian Statistics

Big Data

Bioinformatics & Computational Biology

Causal Inference

Clinical Trials & Adaptive Designs

Computational Inference & Adv. Computing

Data Science

Foundations of Statistical Inference

Health Services & Outcomes Research

Imaging Analysis & Large-Scale Inference

Likelihood Methods

Longitudinal Data Analysis

Missing Data

Outcome Dependent Sampling

Reproducible Research

Regression Modeling Strategies

Statistical & Machine Learning

Statistical Genetics

Survival Analysis

A comprehensive list of faculty interests can be found at:  
<http://biostat.mc.vanderbilt.edu/FacSpecialties>