

Biostatistics, PhD

Learning Outcomes

Students will:

- describe current statistical theory, methods, and practices used in health sciences;
- analyze data from experimental and observational studies;
- design modern modeling structures used in health sciences analyses and research;
- communicate research findings to various audiences in writing and through oral presentation; and
- interpret analytical results from health science studies.

Requirements

The Doctor of Philosophy program in biostatistics requires a minimum of 79 s.h. of graduate credit, including credit from a master's degree. Students must maintain a UI cumulative grade-point average of at least 3.00. Those who receive a grade of C on 7 s.h. of coursework may be dismissed from the program.

All students must successfully complete a comprehensive examination and a dissertation. The research topic and content, which vary depending on the program of study, must be approved by a student's dissertation committee. Other degree requirements include approved electives chosen from the Department of Biostatistics and other University of Iowa courses.

The PhD in biostatistics requires the following work.

Master of Science Background

PhD students must take the following courses required for the Master of Science in biostatistics. Students who have completed equivalent coursework at other institutions may request waivers and/or transfers of credit. Students who earned a Master of Science with a major in biostatistics at the University of Iowa automatically receive credit for these courses.

Course #	Title	Hours
This sequence:		
STAT:5100- STAT:5101	Statistical Inference I-II	6
All of these:		
BIOS:5510	Biostatistical Computing (taken twice for 2 s.h. each; topics should be programming with R and programming with SAS)	4
BIOS:5710 & BIOS:5720	Biostatistical Methods I-II	8
BIOS:5730	Biostatistical Methods in Categorical Data	3
BIOS:6610	Statistical Methods in Clinical Trials	3
BIOS:7500	Preceptorship in Biostatistics	3
EPID:4400	Epidemiology I: Principles	3

Public Health Requirement

Course #	Title	Hours
This course:		
CPH:6100	Essentials of Public Health	2

Responsible Conduct of Research Training

Course #	Title	Hours
This course:		
BIOS:7270	Scholarly Integrity in Biostatistics	1

Core Courses

Course #	Title	Hours
All of these:		
BIOS:6810	Bayesian Methods and Design	3
BIOS:7110	Likelihood Theory and Extensions	4
BIOS:7210	Survival Data Analysis	3
BIOS:7250	Theory of Linear and Generalized Linear Models	4
BIOS:7310	Longitudinal Data Analysis	3

Electives

With the approval of their advisor, students choose 16–23 s.h. of courses according to their interest in biostatistics, statistics, genetics, computing, public health, or in other areas. No more than 5 s.h. in nonquantitative courses (e.g., epidemiology, environmental health) may count toward the electives requirement. Courses required for the MS that are not previously listed may also be used to satisfy the electives requirement, although BIOS:7800 Independent Study in Biostatistics does not generally count as an elective. At least 6 s.h. of elective coursework must be taken on an A–F graded basis.

These courses are recommended, but other coursework may be selected; students should consult their advisor.

Course #	Title	Hours
BIOS:6420/ EPID:6420	Survey Design and Analysis	3
BIOS:6650/ EPID:6655	Causal Inference	3
BIOS:6720	Statistical Machine Learning for Biomedical and Public Health Data	3
BIOS:7230	Advanced Clinical Trials	3
BIOS:7240	High-Dimensional Data Analysis	3
BIOS:7330	Advanced Biostatistical Computing	3
BIOS:7410	Analysis of Categorical Data	3
BIOS:7600	Advanced Biostatistics Seminar (topics include model selection, spatial biostatistics, statistical methods in genetics/genomics, analysis of network data)	1-3
BIOS:7850	Research in Biostatistics	arr.

BME:5335	Computational Bioinformatics	3
STAT:6560	Applied Time Series Analysis	3
STAT:7400	Computer Intensive Statistics	3

should be discussed with an academic advisor. For additional sample plans, see MyUI.

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This sample plan is currently being reviewed and will be added at a later date.

Dissertation

Students must enroll in the following dissertation course for at least two semesters in residence.

Course #	Title	Hours
BIOS:7900	Thesis/Dissertation	6-13

Combined Programs

PhD/MD

Students may work toward the Doctor of Medicine degree and a PhD in biostatistics in a combined degree program offered by the Carver College of Medicine and the College of Public Health. Applicants must be admitted to both programs before they may be admitted to the combined degree program. See the Medical Scientist Training Program (Carver College of Medicine) in the catalog.

Admission

Applicants to the PhD program in biostatistics must apply through the Schools of Public Health Application Service (SOPHAS). After the SOPHAS application is verified, the applicant pays a supplemental Graduate College admission fee to University of Iowa Admissions. For detailed application information, visit Requirements and How to Apply to Biostatistics on the Department of Biostatistics website.

The biostatistics faculty considers several factors when evaluating applications for admission, including grade-point averages, letters of recommendation, intent and motivation for graduate study, and research interests.

All applicants must hold a bachelor's degree and have a cumulative grade-point average of at least 3.00.

All biostatistics applicants are required to have strong written and oral communication skills.

Applicants must meet the admission requirements of the Graduate College; see the Manual of Rules and Regulations on the Graduate College website.

PhD application deadlines are posted on the Department of Biostatistics website. Application deadline is Dec. 1. Visit Requirements and How to Apply to Biostatistics on the department's website.

Career Advancement

The program prepares students for professional and academic careers in biostatistics, especially for positions that emphasize developing and applying statistical methodology to solve important biological and public health problems.

Academic Plans

Sample Plan of Study

Sample plans represent one way to complete a program of study. Actual course selection and sequence will vary and