Twin Cities Campus

Biostatistics Ph.D.

School of Public Health - Adm

School of Public Health

Link to a list of faculty for this program.

Contact Information:
School of Public Health, MMC 819, A395 Mayo Memorial Building, 420 Delaware Street, Minneapolis, MN 55455 (612-626-3500 OR 1-800-774-8636, Fax: 612-624-4498)
Email: sph-oasr@umn.edu
Website: http://www.sph.umn.edu

- Program Type: Doctorate
- Requirements for this program are current for Fall 2017
- Length of program in credits: 59 to 67
- This program does not require summer semesters for timely completion.
- Degree: Doctor of Philosophy

Along with the program-specific requirements listed below, please read the General Information section of the catalog website for requirements that apply to all major fields.

Biostatistics combines statistics, biomedical science, and computing to advance health research. Biostatisticians design, direct, and analyze clinical trials; develop new statistical methods; and analyze data from observational studies, laboratory experiments, and health surveys. This is an ideal field for students who have strong mathematical backgrounds and who enjoy working with computers, collaborating with investigators, and participating in health research. Students take courses in biostatistical methods, theory of statistics, clinical trials, statistical computing, categorical data, survival analysis, and health sciences.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Prerequisites for Admission

The preferred undergraduate GPA for admittance to the program is 3.70.

Other requirements to be completed before admission:
At least three semesters of calculus (including multivariable) and one semester of linear algebra, and two semesters of undergraduate courses in probability and mathematical statistics are strongly recommended. Real analysis or an equivalent is recommended. Experience with programming language (e.g., R, Java, C) and exposure to applied statistics is helpful, but not required.

In addition to completing the SOPHAS application, applicants must submit the following directly to SOPHAS:
Statement of purpose and objectives (an essay describing past education, experience, and current professional career objectives)
Résumé or curriculum vitae
Official postsecondary transcripts from all institutions attended, including previous study at the University of Minnesota (have transcripts sent directly from the institutions to SOPHAS)
Three letters of recommendation from persons qualified to assess academic work; clinical, public health, or professional experience; and leadership potential

Special Application Requirements:
All admitted international Ph.D. applicants are required to provide a World Education Services (WES) document verification report prior to beginning the program.

Proof of English Proficiency
Applicants whose native language is not English, or whose academic study was done exclusively at non-English speaking institutions, must prove English proficiency by providing either official Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) scores. Official report of the scores should be sent directly to SOPHAS using designation code 5688 for the TOEFL or designation code SOPHAS for the IELTS. Scores must be less than two years old. The preferred minimum English language test scores for admission to the School of Public Health are listed below.

The English Language test requirement may be waived if an applicant can provide proof of one of the following:
- Completion of 16 semester credits/24 quarter credits (within the past 24 months) in an academic program at a recognized institution of higher learning in the U.S. or Canada.

- An Educational Commission for Foreign Medical Graduates (ECFMG) certificate. Students should have an official or attested copy sent directly to the University of Minnesota School of Public Health at the address listed above.

Applicants must submit their test score(s) from the following:

- GRE
  - General Test - Verbal Reasoning: 150
  - General Test - Quantitative Reasoning: 146

International applicants must submit score(s) from one of the following tests:

- TOEFL
  - Internet Based - Total Score: 100
  - Paper Based - Total Score: 600
- IELTS
  - Total Score: 7
- MELAB
  - Final score: 80

Key to test abbreviations(GRE, TOEFL, IELTS, MELAB).

For an online application or for more information about graduate education admissions, see the General Information section of the catalog website.

Program Requirements

35 to 43 credits are required in the major.
24 thesis credits are required.

This program may be completed with a minor.

Use of 4xxx courses towards program requirements is not permitted.

A minimum GPA of 3.3 is required for students to remain in good standing.

At least 3 semesters must be completed before filing a Degree Program Form.

The PhD program usually requires three years of full-time study after the MS degree. Students entering the PhD program without an MS degree in mathematics or statistics will be required to take additional core coursework.

Required Coursework

Core Coursework

All students take the following 20 credits of core coursework:
PUBH 8401 - Linear Models (3.0 cr)
PUBH 8403 - Research Skills in Biostatistics (1.0 cr)
PUBH 8412 - Advanced Statistical Inference (3.0 cr)
PUBH 8432 - Probability Models for Biostatistics (3.0 cr)
PUBH 8442 - Bayesian Decision Theory and Data Analysis (3.0 cr)
STAT 8101 - Theory of Statistics 1 (3.0 cr)
STAT 8102 - Theory of Statistics 2 (3.0 cr)

Elective Coursework

All students take at least 3 elective courses for a total of 9 or more credits from the following biostatistics and statistics course lists. Courses are selected in consultation with the advisor.

Biostatistics Elective Courses

PUBH 7420 - Clinical Trials: Design, Implementation, and Analysis (3.0 cr)
PUBH 7465 - Biostatistics Consulting (2.0 cr)
PUBH 8422 *{Inactive}*(3.0 cr)
PUBH 8435 *{Inactive}*(3.0 cr)
PUBH 8445 - Statistics for Human Genetics and Molecular Biology (3.0 cr)
PUBH 8446 - Advanced Statistical Genetics and Genomics (3.0 cr)
PUBH 8452 - Advanced Longitudinal Data Analysis (3.0 cr)
PUBH 8462 - Advanced Survival Analysis (3.0 cr)
PUBH 8472 - Spatial Biostatistics (3.0 cr)
PUBH 8482 - Sequential and Adaptive Methods for Clinical Trials (3.0 cr)
PUBH 8492 - Theories of Hierarchical and Other Richly Parametrized Linear Models (3.0 cr)

Statistics Elective Course

Students may select, in consultation with the advisor, an 8xxx-level course offered by the School of Statistics that is not among the core courses listed above.

STAT 8xxx

Biostatistics Topics Course

Students may select, in consultation with the advisor, any PUBH 84xx biostatistics topic course that is not among the core courses listed above.

Health Science Elective

Take 3 credits of PUBH health science electives offered by other divisions in the School of Public Health or other Academic Health Center programs.

PUBH 6xxx
PUBH 7xxx
PUBH 8xxx

Survival Analysis Course

Take PUBH 7450 as early as possible during the PhD program. Students who have taken a course equivalent to PUBH 7450 should confer with their advisor regarding a substitute course.

PUBH 7450 - Survival Analysis (3.0 cr)

Thesis Credits

Take at least 24 doctoral thesis credits.

PUBH 8888 - Thesis Credit: Doctoral (1.0 - 24.0 cr)

Curriculum for students without an MS in mathematics or statistics

Students without the MS in mathematics or statistics must take two additional core courses.

Students also are strongly recommended to gain more background in real analysis by taking MATH 4603, Advanced Calculus I, in the fall of their first year. Students with a prior analysis course may choose instead, but are not required, to take MATH 5615 and MATH 5616 as an elective.

Additional Core Coursework

In addition to the standard curriculum outlined above, take the following two courses:

PUBH 7405 - Biostatistical Inference I (4.0 cr)
PUBH 7406 - Biostatistical Inference II (3.0 cr)