

BIostatISTICS AND HEALTH ANALYTICS, M.S.

The 21st century is the era of "big data." Every day, we create 2.5 quintillion bytes of data – so much that 90% of the data in the world today has been created in the last two years alone. It is estimated that 30% of this data comes from the health care industry. Saint Louis University's Master of Science in Biostatistics and Health Analytics prepares students to handle this data while applying analytic techniques to answer important research questions related to health and health care.

Program Highlights

- This program is designed for SLU students interested in a field that combines quantitative reasoning, coding and scientific skills to solve problems in health and medicine. It is suited for those with strong quantitative abilities and a desire to apply mathematics, statistics, computer programming and data analysis to health-related issues.
- An M.S. in biostatistics and health analytics can prepare students for professional biostatistical careers and provides a firm academic foundation for subsequent doctoral study in statistical science.

Biostatistics is a science, technology, engineering and mathematics (STEM) focus area because biostatistics is a mathematically based science. In 2006, the United States launched a program to increase the number of students who receive training in STEM areas. This program will fill the need for graduates with technical abilities to analyze data and draw inferences.

Curriculum Overview

Students take courses in public health, the theory of biostatistics, methods of biostatistics and computing. Students finish by doing a capstone project under the direction of a faculty member in the Department of Epidemiology and Biostatistics.

Two Concentrations Available

Students interested in learning skills across a broad spectrum of biostatistics and data analytics can choose the traditional biostatistics concentration. Those who want to apply their skills to geospatial data can choose the geospatial health data analytics concentration. Both programs require a core set of material on biostatistics and analytics, and each concentration has its own requirements for completion.

Fieldwork and Research Opportunities

Students will be able to do research as part of their capstone project.

Careers

Graduates of SLU's M.S. in biostatistics and health analytics are prepared to work as biostatisticians, data scientists or data analysts.

Data scientists, biostatisticians and statisticians are often rated as among the nation's top jobs, measured in salary and job satisfaction.

Admission Requirements

Applicants should have a bachelor's degree in a science-related field, such as chemistry, biology, physics, mathematics, engineering, etc., with an overall GPA of 2.5 or higher. At least one semester of calculus and one introductory statistics course are required.

Tuition

| Tuition | Cost Per Credit |
|------------------|-----------------|
| Graduate Tuition | \$1,370 |

Additional charges may apply. Other resources are listed below:

Net Price Calculator (<https://www.slu.edu/financial-aid/tuition-and-costs/calculator.php>)

Information on Tuition and Fees (<https://catalog.slu.edu/academic-policies/student-financial-services/tuition/>)

Miscellaneous Fees (<https://catalog.slu.edu/academic-policies/student-financial-services/fees/>)

Information on Summer Tuition (<https://catalog.slu.edu/academic-policies/student-financial-services/tuition-summer/>)

Scholarships and Financial Aid

The College for Public Health and Social Justice offers several ways to help finance graduate education. Opportunities include a limited number of merit-based scholarships and graduate research assistantships. Awards are made to applicants with the highest combinations of GPAs and test scores who complete their applications by the priority deadlines.

For more information, visit the Office of Student Financial Services (<https://www.slu.edu/financial-aid/>).

Accreditation

Saint Louis University's College for Public Health and Social Justice is fully accredited by the Council on Education for Public Health (CEPH). To see our most recent accreditation documentation, please visit the College for Public Health and Social Justice website (<https://www.slu.edu/public-health-social-justice/about/accreditation.php>). (<https://www.slu.edu/public-health-social-justice/about/accreditation.php>)

Learning Outcomes

Learning Outcomes Common to Both Concentrations

- **Foundations:** Students should be able to apply foundational principles of probability and statistics to develop methods for estimation and hypothesis testing.
- **Analysis:** Students will apply advanced statistical methods to analyze data and make inferences to answer research questions in public health.
- **Communication:** Students will describe the process of data collection, the application of statistical methodology, and the results of statistical analysis orally and in writing.

Additional Learning Outcomes for Traditional Biostatistics Concentration

- **Data and computing:** Students will apply the appropriate software to collect, store, manage, clean and analyze data.
- **Design:** Students should be able to design experiments or data collection strategies, including sample size requirements, to answer research questions in public health.

Additional Learning Outcomes for Geospatial and Health Data Analytics Concentration

- **Data management:** Students will acquire, manage, analyze, and display geospatial health data.
- **Spatial and Spatio-temporal inference:** Students will build and analyze models to assess the health of populations across both time and geographic regions.

Requirements

| Code | Title | Credits |
|--|--|-----------|
| Required Core Courses | | |
| BST 5020 | Theory of Biostatistics | 3 |
| BST 5025 | Theory of Biostatistics II | 3 |
| BST 5100 | Introduction to General Linear Modeling | 3 |
| BST 5400 | Applied Data Management | 3 |
| PUBH 5030 | Methodological Approaches to Understanding Population Health | 3 |
| BST 5961 | Master's Project | 3 |
| Concentrations | | 12 |
| Select one of the following: | | |
| Traditional Biostatistics Concentration (p. 2) | | |
| Geospatial Health Data Analytics Concentration (p. 2) | | |
| Elective | | 3 |
| Select one course from below or from courses required for the other concentration (p. 2) | | |
| Total Credits | | 33 |

Continuation Standards

Students must maintain a cumulative grade point average (GPA) of 3.00 in all graduate/professional courses.

Electives

| Code | Title | Credits |
|----------|--|---------|
| BST 5220 | Multilevel and Longitudinal Data Analysis | 3 |
| BST 5230 | Bayesian Statistics | 3 |
| BST 5420 | Sampling Theory and Survey Design in Public Health | 3 |
| BST 6100 | Causal Inference | 3 |
| GIS 5030 | Geospatial Data Management | 3 |
| SOC 5670 | Spatial Demography – Applied Spatial Statistics | 3 |
| GIS 5120 | Geospatial Analytics | 3 |

Traditional Biostatistics Concentration

| Code | Title | Credits |
|----------------------|---|-----------|
| BST 5030 | Statistical Programming and Study Planning: SAS | 3 |
| BST 5200 | Survival Data Analysis | 3 |
| BST 5210 | Categorical Data Analysis | 3 |
| BST 5500 | Statistical Learning | 3 |
| Total Credits | | 12 |

Geospatial Health Data Analytics Concentration

| Code | Title | Credits |
|----------------------|--|-----------|
| GIS 5010 | Introduction to Geographic Information Systems | 3 |
| BST 5600 | R for Spatial Analysis | 3 |
| BST 5610 | Spatial Epidemiology and Disease Mapping | 3 |
| BST 5450 | Data Visualization | 3 |
| Total Credits | | 12 |

Roadmap

Roadmaps are recommended semester-by-semester plans of study for programs and assume full-time enrollment unless otherwise noted.

Courses and milestones designated as critical (marked with !) must be completed in the semester listed to ensure a timely graduation. Transfer credit may change the roadmap.

This roadmap should not be used in the place of regular academic advising appointments. All students are encouraged to meet with their advisor/mentor each semester. Requirements, course availability and sequencing are subject to change.

Geospatial Health Data Analytics Concentration

| Course | Title | Credits |
|----------------------|--|-----------|
| Year One | | |
| Fall | | |
| BST 5020 | Theory of Biostatistics | 3 |
| BST 5400 | Applied Data Management | 3 |
| BST 5450 | Data Visualization | 3 |
| Credits | | 9 |
| Spring | | |
| BST 5025 | Theory of Biostatistics II | 3 |
| BST 5100 | Introduction to General Linear Modeling | 3 |
| BST 5600 | R for Spatial Analysis | 3 |
| PUBH 5030 | Methodological Approaches to Understanding Population Health | 3 |
| Credits | | 12 |
| Year Two | | |
| Fall | | |
| BST 5610 | Spatial Epidemiology and Disease Mapping | 3 |
| BST 5XXX | Biostatistics Elective | 3 |
| Credits | | 6 |
| Spring | | |
| GIS 5010 | Introduction to Geographic Information Systems | 3 |
| BST 5961 | Master's Project | 3 |
| Credits | | 6 |
| Total Credits | | 33 |

Traditional Biostatistics and Health Analytics Concentration

| Course | Title | Credits |
|----------------------|--|-----------|
| Year One | | |
| Fall | | |
| BST 5020 | Theory of Biostatistics | 3 |
| BST 5400 | Applied Data Management | 3 |
| BST 5030 | Statistical Programming and Study Planning: SAS | 3 |
| Credits | | 9 |
| Spring | | |
| BST 5025 | Theory of Biostatistics II | 3 |
| BST 5100 | Introduction to General Linear Modeling | 3 |
| PUBH 5030 | Methodological Approaches to Understanding Population Health | 3 |
| Credits | | 9 |
| Year Two | | |
| Fall | | |
| BST 5200 | Survival Data Analysis | 3 |
| BST 5210 | Categorical Data Analysis | 3 |
| BST 5500 | Statistical Learning | 3 |
| Credits | | 9 |
| Spring | | |
| BST 5961 | Master's Project | 3 |
| Elective | Biostatistics Elective chosen in consultation with mentor | 3 |
| Credits | | 6 |
| Total Credits | | 33 |

Contact Us

Apply for Admission (<https://sophas.liaisoncas.com/applicant-ux/#/deeplink/programSearch/organization/6425937835738032128>)

For additional admission questions please contact:

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