BIOSTATISTICS, SCM

The Johns Hopkins Department of Biostatistics ScM program is intended for individuals who have demonstrated excellence at the undergraduate level in quantitative or biological sciences and prepares them for a career as a professional statistician. Typically, ScM graduates assume positions in research or professional settings as scientific project coordinators and data analysts where they:

- Design research studies of human health and disease.
- Design and implement data management systems, pipelines and tools.
- Design and implement tabular and graphical displays of quantitative information.
- Draw inferences from quantitative data.
- Use statistical reasoning and theory to deal effectively with non-standard statistical problems.
- Perform major statistical analyses to address public health or statistical research questions.
- Assist statistical researchers in the conduct of original, methodologic research.

More detailed information is available below, in the Department of Biostatistics Student Handbook, and in the School’s Policies and Procedures Memorandum for the ScM degree.

Program Overview

The ScM program typically takes two years, with the first year spent in didactic coursework and the second year spent working closely with a departmental faculty member in a master’s thesis project and completing elective courses that are in-line with the individual student’s interests.

Program Requirements

Student Evaluations

The Department is committed to providing every opportunity for its ScM students to successfully complete this academic program. To support students in progressing toward the degree, a comprehensive written examination is given at the end of the first year.

Seminars

The Department offers a weekly seminar program (https://www.jhsph.edu/departments/biostatistics/about-us/news-and-seminars/seminars/) featuring recent work by outstanding statistical scientists from around the world. Attendance is required for all graduate students. One seminar per month may be designated to be part of the Biostatistics “Grand Rounds” series, which features statistical analyses addressing important public health questions.

In addition, first year graduate students are required to complete the Current Topics in Biostatistics Research course, where faculty, postdocs and senior students from the Department present their research, with a focus on the public health and scientific questions driving the work, why the research makes a difference for the subject area and how to translate the research into practice.

Course location and modality is found on the BSPH website (https://publichealth.jhu.edu/academics/course-directory/coursessection-numbers-explained/).

Recommended Curriculum

The second year curriculum is considerably less course-intensive than the first, as thesis development becomes a priority during this year. However, we encourage students to avail themselves of the array of biostatistical electives that are available and to be mindful of completing the School’s extra-departmental course requirements and new requirements for students who have not already taken 3 credits of Epidemiology coursework and PH.550.865 Public Health Perspectives on Research.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>PH.260.600</td>
<td>Introduction to the Biomedical Sciences</td>
<td>4</td>
</tr>
<tr>
<td>PH.140.651</td>
<td>Methods in Biostatistics I</td>
<td>4</td>
</tr>
<tr>
<td>PH.140.646</td>
<td>Essentials of Probability and Statistical Inference I: Probability</td>
<td>4</td>
</tr>
<tr>
<td>PH.140.776</td>
<td>Statistical Computing</td>
<td>3</td>
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<tr>
<td>PH.340.721</td>
<td>Epidemiologic Inference in Public Health</td>
<td>5</td>
</tr>
<tr>
<td>PH.550.860</td>
<td>Academic &amp; Research Ethics at BSPH</td>
<td>0</td>
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<tr>
<td>PH.140.840</td>
<td>Special Studies and Research Biostatistics</td>
<td>1-22</td>
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<tr>
<td>PH.140.860</td>
<td>Current Topics in Biostatistics Research</td>
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<td>PH.140.652</td>
<td>Methods in Biostatistics II</td>
<td>4</td>
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<tr>
<td>PH.140.647</td>
<td>Essentials of Probability and Statistical Inference II: Statistical Inference</td>
<td>4</td>
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<td>PH.550.865</td>
<td>Public Health Perspectives on Research</td>
<td>2</td>
</tr>
<tr>
<td>PH.140.630</td>
<td>Introduction to Data Management</td>
<td>3</td>
</tr>
<tr>
<td>PH.140.840</td>
<td>Special Studies and Research Biostatistics</td>
<td>1-22</td>
</tr>
<tr>
<td>PH.140.860</td>
<td>Current Topics in Biostatistics Research</td>
<td>1</td>
</tr>
<tr>
<td>PH.140.653</td>
<td>Methods in Biostatistics III</td>
<td>4</td>
</tr>
<tr>
<td>PH.140.648</td>
<td>Essentials of Probability and Statistical Inference III: Theory of Modern Statistical Methods</td>
<td>4</td>
</tr>
<tr>
<td>PH.140.631</td>
<td>The SAS Statistical Package: A Survey for Statisticians</td>
<td>3</td>
</tr>
<tr>
<td>PH.140.840</td>
<td>Special Studies and Research Biostatistics</td>
<td>1-22</td>
</tr>
<tr>
<td>PH.140.860</td>
<td>Current Topics in Biostatistics Research</td>
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</tr>
<tr>
<td>PH.140.654</td>
<td>Methods in Biostatistics IV</td>
<td>4</td>
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</table>
PH.140.649 Essentials of Probability and Statistical Inference IV 4
Electives
PH.140.840 Special Studies and Research Biostatistics (Credits as needed in order to get to at least 16 credits total) 1 - 22
PH.140.860 Current Topics in Biostatistics Research 1
Credits 10-31
Second Year
PH.140.776 Statistical Computing (if not taken in first year) 3
PH.140.711 Advanced Data Science I 6 3
PH.550.860 Academic & Research Ethics at BSPH (if not taken in first year) 7 0
Electives 8
PH.140.820 Thesis Research Biostatistics (credits as needed in order to get to at least 16 credits total) 1-22
PH.140.840 Special Studies and Research Biostatistics (credits as needed in order to get to at least 16 credits total) 10-31
Second Term
PH.140.712 Advanced Data Science II 6 3
PH.140.643 Practice of Statistical Consulting 6 3
Electives 8
Select one or both of the following: 1 - 22
PH.140.820 Thesis Research Biostatistics (credits as needed in order to get to at least 16 credits total)
PH.140.840 Special Studies and Research Biostatistics (credits as needed in order to get to at least 16 credits total)
Credits 10-31
PH.552.601 Foundational Principles of Public Health
PH.552.603 The Role of Qualitative Methods and Science in Describing and Assessing a Population’s Health
PH.552.605 Public Health Perspectives on Research
PH.552.607 Essentials of Probability and Statistical Inference I – IV
PH.552.608 Biologic, Genetic and Infectious Bases of Determinants of Health, if applicable 9 3
PH.340.694 Power and Sample Size for the Design of Epidemiological Studies I
PH.552.609 Psychological and Behavioral Factors That Affect A Population’s Health
PH.550.865 Public Health Perspectives on Research
PH.140.641 Survival Analysis and PH.140.741 Advanced Survival Analysis will be taught in terms 1 and 2, PH.140.630 Introduction to Data Management in term 2, PH.140.631 The SAS Statistical Package: A Survey for Statisticians in term 3, PH.140.642 Design of Clinical Experiments in term 3, and PH.340.694 Power and Sample Size for the Design of Epidemiological Studies in term 3. Please consult the SPH course search engine (http://www.jhsph.edu/courses/(http://www.jhsph.edu/courses/courses/)) to identify additional Biostatistics electives that are available.
PH.140.649 Essentials of Probability and Statistical Inference IV
PH.140.711 Advanced Data Science I
PH.550.860 Academic & Research Ethics at BSPH (if not taken in first year)
PH.140.776 Statistical Computing
PH.140.712 Advanced Data Science II
PH.140.643 Practice of Statistical Consulting
Electives
PH.140.820 Thesis Research Biostatistics
PH.140.840 Special Studies and Research Biostatistics
Select one or both of the following: 1 - 22
PH.140.820 Thesis Research Biostatistics (credits as needed in order to get to at least 16 credits total)
PH.140.840 Special Studies and Research Biostatistics (credits as needed in order to get to at least 16 credits total)
Credits 10-31
Third Term
Electives 8
PH.140.820 Thesis Research Biostatistics (credits as needed in order to get to at least 16 credits total) 1 - 22
PH.140.840 Special Studies and Research Biostatistics (credits as needed in order to get to at least 16 credits total)
Credits 4-25
Fourth Term
Electives 8
PH.140.820 Thesis Research Biostatistics (credits as needed in order to get to at least 16 credits total)
PH.140.840 Special Studies and Research Biostatistics (credits as needed in order to get to at least 16 credits total)
Credits 10-31
First Year
Students must enroll in a minimum of 16 credits per term. The 16 credits can be reached by enrolling for special studies credit
PH.140.711 Advanced Data Science I
PH.140.712 Advanced Data Science II
PH.140.643 Practice of Statistical Consulting
PH.140.649 Essentials of Probability and Statistical Inference IV
PH.550.860 Academic & Research Ethics at BSPH (if not taken in first year)
Electives
PH.140.820 Thesis Research Biostatistics
PH.140.840 Special Studies and Research Biostatistics
Select one or both of the following: 1 - 22
PH.140.820 Thesis Research Biostatistics (credits as needed in order to get to at least 16 credits total)
PH.140.840 Special Studies and Research Biostatistics (credits as needed in order to get to at least 16 credits total)
Credits 10-31
PH.140.776 Statistical Computing
PH.140.711 Advanced Data Science I
PH.550.860 Academic & Research Ethics at BSPH (if not taken in first year)
Electives
PH.140.820 Thesis Research Biostatistics
PH.140.840 Special Studies and Research Biostatistics
Select one or both of the following: 1 - 22
PH.140.820 Thesis Research Biostatistics (credits as needed in order to get to at least 16 credits total)
PH.140.840 Special Studies and Research Biostatistics (credits as needed in order to get to at least 16 credits total)
Credits 10-31
PH.140.712 Advanced Data Science II
PH.140.643 Practice of Statistical Consulting
Electives
PH.140.820 Thesis Research Biostatistics
PH.140.840 Special Studies and Research Biostatistics
Select one or both of the following: 1 - 22
PH.140.820 Thesis Research Biostatistics (credits as needed in order to get to at least 16 credits total)
PH.140.840 Special Studies and Research Biostatistics (credits as needed in order to get to at least 16 credits total)
Credits 4-25
range of elective courses to meet their educational needs. During their time in the program, ScM students may choose from a wide range of elective courses to meet their educational needs.

### Electives

During their time in the program, ScM students may choose from a wide range of elective courses to meet their educational needs.

<table>
<thead>
<tr>
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<th>Credits</th>
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<tbody>
<tr>
<td>PH.140.642</td>
<td>Design of Clinical Experiments</td>
<td>3</td>
</tr>
<tr>
<td>PH.340.645</td>
<td>Introduction to Clinical Trials</td>
<td>3</td>
</tr>
</tbody>
</table>

Students specifically interested in learning the SAS statistical package may want to consider the course:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH.140.632</td>
<td>Introduction to the SAS Statistical Package</td>
<td>3</td>
</tr>
</tbody>
</table>

Click here to search for course times and descriptions (https://www.jhsph.edu/courses/).

### Master’s Student Academic Standing Guide

This document covers policies regarding academic performance of master’s students that are specific to the Department of Biostatistics. Students also must satisfy the academic standing requirements of the University and Bloomberg School of Public Health. Master’s students are expected to maintain a grade point average of no less than 2.75 throughout their studies, to meet the minimum grade threshold of a C in required courses, and to complete academic requirements within established deadlines.

### Departmental Master’s Comprehensive Exam

The Departmental master’s exam is taken at the end of the first year of study (typically the third Monday following the end of the 4th term). The Departmental master’s exam is administered only once a year.

The grading of the Departmental exam is as follows. Passing scores are determined by exam writers after grading with examiners blinded from student names. Students who pass all sections of the exam pass the exam. Students failing one or more sections will be discussed by the faculty as a whole. This discussion will include exam and course performance in the first year. Possible resolutions include: declaring the student as passing the exam, declaring the student as having failed the exam, take-home remediation of sections of the exam or a full retake (only available if it is the student’s first attempt at the exam).

In the event of a retake of the exam, students are allowed one retake. Students retaking typically occur in the following year, with exceptions occurring when mitigating circumstances are present, such as a leave of absence. In the event of a failure in the retake, the student will be asked to leave their master’s program or switch to another program (for example from ScM to MHS).

Students who fail the exam are not eligible to receive the 75% tuition reduction for their second year of study. Failing the exam typically results in at least one extra academic year without the tuition reduction.

Often students who will not receive the 75% tuition reduction in their second year consider switching to part time status. Such a switch must be discussed and approved with the graduate committee. Further, it should be noted that part-time status is often not an option for foreign students due to visa issues and residency requirements.

Upon successful completion of the Master of Science in Biostatistics, students will have mastered the following competencies:

- Design research studies of human health and disease.
- Design and implement data management systems, pipelines and tools.
- Design and implement tabular and graphical displays of quantitative information.
- Draw inferences from quantitative data.
- Use statistical reasoning and theory to deal effectively with non-standard statistical problems.
- Perform major statistical analyses to address public health or statistical research questions.
- Assist statistical researchers in the conduct of original, methodologic research.