<table>
<thead>
<tr>
<th>M.S. in Biostatistics</th>
<th>Primarily Gained through These Required Courses</th>
<th>Secondarily Gained through These Elective or Other Required Courses</th>
</tr>
</thead>
</table>
| **Demonstrate a broad knowledge and understanding of current statistical theory, methods, and practices in the health sciences.** | BIOS:5710 Biostatistical Methods I  
BIOS:5720 Biostatistical Methods II  
BIOS:5730 Biostatistical Methods in Categorical Data  
BIOS:6610 Statistical Methods in Clinical Trials  
STAT:4100 Mathematical Statistics I  
STAT:4101 Mathematical Statistics II  
STAT:5100 Statistical Inference I  
STAT:5101 Statistical Inference II  
EPID:4400 Epidemiology I: Principles | BIOS:6210 Applied Survival Analysis  
BIOS:6310 Introductory Longitudinal Data Analysis  
BIOS:6420 Survey Design and Analysis  
BIOS:6650 Casual Inference  
BIOS:6810 Bayesian Methods and Design  
BIOS:7110 Theory of Biostatistics I  
BIOS:7120 Theory of Biostatistics II  
BIOS:7210 Survival Data Analysis  
BIOS:7310 Longitudinal Data Analysis  
BIOS:7320 Advanced Clinical Trials  
BIOS:7410 Analysis of Categorical Data  
STAT:4520 Bayesian Statistics |
| **Effectively collaborate on a research team.** | BIOS:5510 Biostatistical Computing  
BIOS:5720 Biostatistical Methods II  
BIOS:5730 Biostatistical Methods in Categorical Data  
BIOS:6610 Statistical Methods in Clinical Trials  
BIOS:7500 Preceptorship in Biostatistics | BIOS:6210 Applied Survival Analysis  
BIOS:6310 Introductory Longitudinal Data Analysis  
BIOS:7270 Scholarly Integrity in Biostatistics |
| **Develop statistical designs and implement analyses for health science investigations.** | BIOS:5720 Biostatistical Methods II  
BIOS:5730 Biostatistical Methods in Categorical Data  
BIOS:6610 Statistical Methods in Clinical Trials  
BIOS:7500 Preceptorship in Biostatistics | BIOS:6210 Applied Survival Analysis  
BIOS:6310 Introductory Longitudinal Data Analysis |
| **Develop computer programs for the management and analysis of data sets.** | BIOS:5510 Biostatistical Computing  
BIOS:5710 Biostatistical Methods I  
BIOS:5720 Biostatistical Methods II  
BIOS:5730 Biostatistical Methods in Categorical Data  
BIOS:7500 Preceptorship in Biostatistics | BIOS:6210 Applied Survival Analysis  
BIOS:6310 Introductory Longitudinal Data Analysis  
BIOS:6420 Survey Design and Analysis |
| **Prepare reports and publications resulting from health science studies.** | BIOS:5710 Biostatistical Methods I  
BIOS:5720 Biostatistical Methods II  
BIOS:5730 Biostatistical Methods in Categorical Data  
BIOS:6610 Statistical Methods in Clinical Trials  
BIOS:7500 Preceptorship in Biostatistics | BIOS:6210 Applied Survival Analysis  
BIOS:6310 Introductory Longitudinal Data Analysis  
BIOS:7270 Scholarly Integrity in Biostatistics |
| **Effectively communicate key statistical principles to a non-statistical audience.** | BIOS:5710 Biostatistical Methods I  
BIOS:5720 Biostatistical Methods II  
BIOS:5730 Biostatistical Methods in Categorical Data  
BIOS:6610 Statistical Methods in Clinical Trials  
BIOS:7500 Preceptorship in Biostatistics | BIOS:6210 Applied Survival Analysis  
BIOS:6310 Introductory Longitudinal Data Analysis  
BIOS:6420 Survey Design and Analysis  
BIOS:7270 Scholarly Integrity in Biostatistics |
### Ph.D. in Biostatistics

<table>
<thead>
<tr>
<th>Graduates of the PhD in Biostatistics will be able to:</th>
<th>Primarily Gained through These Required Courses</th>
<th>Secondarily Gained through These Elective or Other Required Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master MS competencies</td>
<td>See previous page</td>
<td></td>
</tr>
<tr>
<td>Demonstrate an increased level of knowledge and</td>
<td>BIOS:7110 Theory of Biostatistics I</td>
<td>BIOS:6650 Casual Inference</td>
</tr>
<tr>
<td>understanding of current statistical theory, methods,</td>
<td>BIOS:7120 Theory of Biostatistics II</td>
<td>BIOS:6720 Statistical Machine Learning for Biomedical &amp; Public</td>
</tr>
<tr>
<td>and practices in the health sciences.</td>
<td>BIOS:7210 Survival Data Analysis</td>
<td>Health Data</td>
</tr>
<tr>
<td></td>
<td>BIOS:7310 Longitudinal Data Analysis</td>
<td>BIOS:6810 Bayesian Methods and Design</td>
</tr>
<tr>
<td></td>
<td>BIOS:7410 Analysis of Categorical Data</td>
<td>BIOS:7320 Advanced Clinical Trials</td>
</tr>
<tr>
<td></td>
<td>STAT:7200 Linear Models</td>
<td>BIOS:7600 Advanced Biostatistics Seminar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STAT:7520 Bayesian Statistics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STAT:7400 Computer Intensive Statistics</td>
</tr>
<tr>
<td>Develop new statistical methods.</td>
<td>BIOS:7900 Dissertation</td>
<td>BIOS:7600 Advanced Biostatistics Seminar</td>
</tr>
<tr>
<td>Design, manage data, analyze and interpret data from</td>
<td>BIOS:7210 Survival Data Analysis</td>
<td>BIOS:6650 Casual Inference</td>
</tr>
<tr>
<td>a variety of experimental and observational studies.</td>
<td>BIOS:7310 Longitudinal Data Analysis</td>
<td>BIOS:6720 Statistical Machine Learning for Biomedical &amp; Public</td>
</tr>
<tr>
<td></td>
<td>BIOS:7410 Analysis of Categorical Data</td>
<td>Health Data</td>
</tr>
<tr>
<td></td>
<td>BIOS:7500 Preceptorship in Biostatistics</td>
<td>BIOS:6810 Bayesian Methods and Design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIOS:7320 Advanced Clinical Trials</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIOS:7600 Advanced Biostatistics Seminar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STAT:7520 Bayesian Statistics</td>
</tr>
<tr>
<td>Communicate research findings, including new statistical</td>
<td>BIOS:7210 Survival Data Analysis</td>
<td>BIOS:6650 Casual Inference</td>
</tr>
<tr>
<td>methods developed, effectively to various audiences in</td>
<td>BIOS:7310 Longitudinal Data Analysis</td>
<td>BIOS:6720 Statistical Machine Learning for Biomedical &amp; Public</td>
</tr>
<tr>
<td>writing and through oral presentation.</td>
<td>BIOS:7410 Analysis of Categorical Data</td>
<td>Health Data</td>
</tr>
<tr>
<td></td>
<td>BIOS:7500 Preceptorship in Biostatistics</td>
<td>BIOS:6810 Bayesian Methods and Design</td>
</tr>
<tr>
<td></td>
<td>BIOS:7900 Dissertation</td>
<td>BIOS:7320 Advanced Clinical Trials</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIOS:7600 Advanced Biostatistics Seminar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STAT:7520 Bayesian Statistics</td>
</tr>
</tbody>
</table>
### MPH-Quantitative Methods Subtrack

In addition to mastering the core competencies, graduates of the MPH in Quantitative Methods will be able to:

<table>
<thead>
<tr>
<th>Primarily Gained through These Required Courses</th>
<th>Secondarily Gained through These Elective or Other Required Courses</th>
</tr>
</thead>
</table>
| Demonstrate a broad knowledge and understanding of statistical techniques used in public health studies and investigations. | BIOS:4120 Introduction to Biostatistics  
BIOS:5120 Regression Modeling and ANOVA in the Health Sciences  
BIOS:6110 Applied Categorical Data Analysis  
BIOS:5710 Biostatistical Methods I  
BIOS:5720 Biostatistical Methods II  
BIOS:5730 Biostatistical Methods in Categorical Data | BIOS:5310 Research Data Management  
BIOS:5510 Biostatistical Computing  
BIOS:6210 Applied Survival Analysis  
BIOS:6310 Introductory Longitudinal Data Analysis  
BIOS:6650 Comparative Effectiveness Research Methods for Observational Data  
BIOS:6610 Statistical Methods in Clinical Trials  
BIOS:7270 Scholarly Integrity in Biostatistics  
STAT:3100 Intro to Mathematical Statistics I  
STAT:3101 Intro to Mathematical Statistics II |
| Serve as an advocate for good statistical design in public health investigations | BIOS:4120 Introduction to Biostatistics  
BIOS:5120 Regression Modeling and ANOVA in the Health Sciences  
BIOS:6110 Applied Categorical Data Analysis  
BIOS:5710 Biostatistical Methods I  
BIOS:5720 Biostatistical Methods II  
BIOS:5730 Biostatistical Methods in Categorical Data | |
| Apply appropriate statistical methods for inference about public health related questions, and describe the results to public health professionals and educated lay audiences. | BIOS:4120 Introduction to Biostatistics  
BIOS:5120 Regression Modeling and ANOVA in the Health Sciences  
BIOS:6110 Applied Categorical Data Analysis  
BIOS:5710 Biostatistical Methods I  
BIOS:5720 Biostatistical Methods II  
BIOS:5730 Biostatistical Methods in Categorical Data | BIOS:5310 Research Data Management  
BIOS:5510 Biostatistical Computing  
BIOS:6210 Applied Survival Analysis  
BIOS:6310 Introductory Longitudinal Data Analysis  
BIOS:6650 Comparative Effectiveness Research Methods for Observational Data  
BIOS:6610 Statistical Methods in Clinical Trials  
BIOS:7270 Scholarly Integrity in Biostatistics  
STAT:3100 Intro to Mathematical Statistics I  
STAT:3101 Intro to Mathematical Statistics II |
| Interpret the results of statistical analyses in public health related publications for public health professionals and educated lay audiences. | BIOS:4120 Introduction to Biostatistics  
BIOS:5120 Regression Modeling and ANOVA in the Health Sciences  
BIOS:6110 Applied Categorical Data Analysis  
BIOS:5710 Biostatistical Methods I  
BIOS:5720 Biostatistical Methods II  
BIOS:5730 Biostatistical Methods in Categorical Data | BIOS:5310 Research Data Management  
BIOS:5510 Biostatistical Computing  
BIOS:6210 Applied Survival Analysis  
BIOS:6310 Introductory Longitudinal Data Analysis  
BIOS:6650 Comparative Effectiveness Research Methods for Observational Data  
BIOS:6610 Statistical Methods in Clinical Trials  
BIOS:7270 Scholarly Integrity in Biostatistics  
STAT:3100 Intro to Mathematical Statistics I  
STAT:3101 Intro to Mathematical Statistics II |
| Promote the use of sound statistical methods to answer open questions in public health practice. | BIOS:4120 Introduction to Biostatistics  
BIOS:5120 Regression Modeling and ANOVA in the Health Sciences  
BIOS:6110 Applied Categorical Data Analysis  
BIOS:5710 Biostatistical Methods I  
BIOS:5720 Biostatistical Methods II  
BIOS:5730 Biostatistical Methods in Categorical Data | BIOS:5310 Research Data Management  
BIOS:5510 Biostatistical Computing  
BIOS:6210 Applied Survival Analysis  
BIOS:6310 Introductory Longitudinal Data Analysis  
BIOS:6650 Comparative Effectiveness Research Methods for Observational Data  
BIOS:6610 Statistical Methods in Clinical Trials  
BIOS:7270 Scholarly Integrity in Biostatistics  
STAT:3100 Intro to Mathematical Statistics I  
STAT:3101 Intro to Mathematical Statistics II |
| Function as a collaborator on public health projects, taking a leadership role in the design and implementation of projects. | MPH:7000 MPH Practicum Experience | (Graduate Research Assistantship) |
| Assume responsibility for the design and implementation of analyses in investigations of public health questions. | BIOS:5710 Biostatistical Methods I  
BIOS:5720 Biostatistical Methods II  
BIOS:6110 Applied Categorical Data Analysis  
MPH:7000 MPH Practicum Experience | BIOS:6210 Applied Survival Analysis  
BIOS:6310 Introductory Longitudinal Data Analysis |
| Manage the data for public health related projects such as large community surveys, laboratory investigations, and multi-center clinical trials. | BIOS:5510 Biostatistical Computing | BIOS:5310 Research Data Management  
BIOS:6610 Statistical Methods in Clinical Trials |
| Demonstrate effective written and oral communication skills when communicating quantitative information and statistical inferences to different audiences of public health professionals | BIOS:4120 Introduction to Biostatistics  
BIOS:5120 Regression Modeling and ANOVA in the Health Sciences  
BIOS:6110 Applied Categorical Data Analysis  
BIOS:5710 Biostatistical Methods I  
BIOS:5720 Biostatistical Methods II  
BIOS:5730 Biostatistical Methods in Categorical Data  
MPH:7000 MPH Practicum Experience | BIOS:6210 Applied Survival Analysis  
BIOS:6310 Introductory Longitudinal Data Analysis (Graduate Research Assistantship) |