2021-2022 Curriculum Guide for Master of Science degree program with a specialization in BIOMEDICAL INFORMATICS

The Master of Science (MS) degree is intended for students whose interests in Biomedical Informatics (BMI) are academically oriented rather than directed toward professional practice. The MS degree is a natural entry point for students who are qualified to pursue a PhD degree which requires broader scope and depth of content via additional didactic courses and more intensive research emphasis. To reflect this research and academic orientation, the MS degree requires preparation and defense of a hypothesis based thesis. The MS degree typically can be completed within two years.

Students admitted to the MS degree program are assigned a faculty advisor who will provide guidance throughout the program. This document serves as a resource to be used by the student and the advisor in planning a program with a specialization in Biomedical Informatics, but is not inclusive of all important degree, college, and university requirements. All students are expected to be familiar with the College of Public Health (CPH) Graduate Student Handbook: [http://cph.osu.edu/students/graduate/handbooks](http://cph.osu.edu/students/graduate/handbooks) the Graduate School Handbook: [http://www.gradsch.ohio-state.edu/](http://www.gradsch.ohio-state.edu/) and the CPH competencies: [https://go.osu.edu/cphcompetencies](https://go.osu.edu/cphcompetencies).

**PROGRAM OF STUDY**

The MS-BMI curriculum requires 48 credits.

**Required Foundation Courses (9 credits)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBHLTH 6010</td>
<td>Essentials of Public Health</td>
<td>3</td>
</tr>
<tr>
<td>PUBHBIO 6210</td>
<td>Design &amp; Analysis of Studies in the Health Sciences I</td>
<td>3</td>
</tr>
<tr>
<td>PUBHEPI 6410</td>
<td>Principles of Epidemiology</td>
<td>3</td>
</tr>
</tbody>
</table>

**Required Specialization Courses (23-24 credits)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBHBIO 6211</td>
<td>Design &amp; Analysis of Studies in the Health Sciences II</td>
<td>3</td>
</tr>
<tr>
<td>PUBHBIO 6000+</td>
<td>Advanced Coursework in Biostatistics</td>
<td>3</td>
</tr>
<tr>
<td>PUBHEPI 7410</td>
<td>Epidemiology II &amp; Lab</td>
<td>4</td>
</tr>
<tr>
<td>BMI 5710</td>
<td>Introduction to Biomedical Informatics</td>
<td>3</td>
</tr>
<tr>
<td>BMI 5760</td>
<td>Public Health Informatics</td>
<td>3</td>
</tr>
<tr>
<td>BMI 7891</td>
<td>Seminars in Biomedical Informatics</td>
<td>2</td>
</tr>
<tr>
<td>BMI 7000+</td>
<td>Advanced Coursework in Biomedical Informatics</td>
<td>3</td>
</tr>
</tbody>
</table>

**Ethics course requirement - select one course:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOETHIC 6010</td>
<td>Biomedical Research Ethics</td>
<td>3</td>
</tr>
<tr>
<td>BIOPHRM 7510</td>
<td>Professional and Ethical Issues in Biomedical Sciences</td>
<td>2</td>
</tr>
<tr>
<td>NURSING 7781</td>
<td>Responsible Conduct of Research</td>
<td>3</td>
</tr>
<tr>
<td>SURGERY 8814</td>
<td>Responsible Conduct of Research: Human Participants and the Use of Animals in Biomedical Research</td>
<td>2</td>
</tr>
</tbody>
</table>

**Recommended Electives** (9-10 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI 5730</td>
<td>Introduction to Bioinformatics</td>
<td>3</td>
</tr>
<tr>
<td>BMI 5740</td>
<td>Introduction to Research Informatics</td>
<td>3</td>
</tr>
<tr>
<td>BMI 5780</td>
<td>Programming for Biomedical Informatics</td>
<td>3</td>
</tr>
<tr>
<td>BMI 8040</td>
<td>Special Topics in Clin. &amp; Transl. Informatics</td>
<td>3</td>
</tr>
<tr>
<td>BMI 5750</td>
<td>Methods in Biomedical Informatics</td>
<td>3</td>
</tr>
<tr>
<td>BMI 5770</td>
<td>Health Analytics: Data to Discovery to Dissemination</td>
<td>3</td>
</tr>
<tr>
<td>BMI 8050.01</td>
<td>Special Topics in Biomed Data Sci</td>
<td>varies</td>
</tr>
<tr>
<td>BMI 8130</td>
<td>Analysis and Applications of Genome-Scale Data</td>
<td>3</td>
</tr>
</tbody>
</table>

****Questions regarding the student’s program of study should be directed to the advisor****
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI 8140</td>
<td>Measuring patient experiences and preferences</td>
<td>3</td>
<td>BMI 8150</td>
<td>Rigorous and Reproducible Design &amp; Data Analysis</td>
<td>3</td>
</tr>
<tr>
<td>BMI 7040</td>
<td>Clinical Informatics</td>
<td>3</td>
<td>PUBHBIO 6250</td>
<td>Regression Methods for the Health Sciences</td>
<td>3</td>
</tr>
<tr>
<td>BMI 7810</td>
<td>Design &amp; Methodological Approaches in BMI</td>
<td>3</td>
<td>PUBHBIO 6270</td>
<td>Intro to SAS for Pub Hlth Students</td>
<td>2</td>
</tr>
<tr>
<td>BMI 7830</td>
<td>Adv. Topics in Bioinformatics</td>
<td>3</td>
<td>PUBHEHS 6310</td>
<td>Principles of Envi Health Science Approaches to Health Research</td>
<td>3</td>
</tr>
<tr>
<td>BMI 8030.01</td>
<td>Special Topics in Comp. Biol</td>
<td>Varies</td>
<td>PUBHHMP 7678</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PUBHEPI 6412</td>
<td>Prin Clinical &amp; Transl. Science</td>
<td>2</td>
<td>PUBHHMP 7682</td>
<td>Info Sys for Health Service Org</td>
<td>3</td>
</tr>
<tr>
<td>PUBHEPI 6413</td>
<td>Conduct &amp; Comm Research in CTS</td>
<td>2</td>
<td>CSE 5231</td>
<td>Software Engineering Techniques</td>
<td>2</td>
</tr>
<tr>
<td>PUBHEPI 6431</td>
<td>Design &amp; Implement Health Surveys</td>
<td>3</td>
<td>CSE 5241</td>
<td>Introduction to Database Systems</td>
<td>2</td>
</tr>
<tr>
<td>PUBHEPI 7430</td>
<td>Epidemiology III</td>
<td>4</td>
<td>CSE 5521</td>
<td>Survey of Artificial Intel I: Basic Tech</td>
<td>2</td>
</tr>
<tr>
<td>PUBHBP 6510</td>
<td>Preventing Disease &amp; Promoting Hlth through Behavioral Science</td>
<td>3</td>
<td>CSE 5522</td>
<td>Survey of Artificial Intel II: Adv Tech</td>
<td>3</td>
</tr>
<tr>
<td>PUBHHMP 6610</td>
<td>Intro Health Care Organization</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Students with a background in public health or medicine are encouraged to focus on computer science (CSE) electives to enhance their computational abilities. Similarly, students with backgrounds in computer science, electrical engineering, or information technology are encouraged to focus their electives to enhance their understanding of medicine and public health. Students should work with staff and faculty academic advisors in the Department of Biomedical Informatics to identify suitable electives.**

**Thesis (6 credits)**
BMI 7999 Research in Biomedical Informatics 6 credits

### Sample 2-year Curriculum Plan for the Master of Science in Biomedical Informatics

<table>
<thead>
<tr>
<th>Year</th>
<th>Term</th>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Term Code</th>
<th>Term Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Autumn</td>
<td>PUBHBIO 6210</td>
<td>Design &amp; Analysis of Studies in the Health Sciences I</td>
<td>3</td>
<td>AU, SP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PUBHEPI 6410</td>
<td>Principles of Epidemiology</td>
<td>3</td>
<td>AU</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>BMI 5710</td>
<td>Introduction to Biomedical Informatics</td>
<td>3</td>
<td>AU</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spring</td>
<td>PUBHBIO 6211</td>
<td>Design &amp; Analysis of Studies in the Health Sciences II</td>
<td>3</td>
<td>SP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PUBHEPI 7410</td>
<td>Epidemiology II &amp; Lab</td>
<td>4</td>
<td>SP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ELECTIVE</td>
<td>Essentials of Public Health</td>
<td>3</td>
<td>SP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PUBHLTH 6010</td>
<td>Seminar in Biomedical Informatics</td>
<td>3</td>
<td>SP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>BMI 7891</td>
<td></td>
<td>1</td>
<td>SP</td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td>Summer</td>
<td>ELECTIVE</td>
<td>2-3</td>
<td>AU, SP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2</td>
<td>Autumn</td>
<td>PUBHBIO 6000+</td>
<td>Public Health Informatics</td>
<td>3</td>
<td>AU, SP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>BMI 5760</td>
<td>Research in Biomedical Informatics (Thesis)</td>
<td>6</td>
<td>AU</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>BMI 7999</td>
<td>Seminar in Biomedical Informatics</td>
<td>1</td>
<td>AU</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>BMI 7891</td>
<td></td>
<td></td>
<td>SP</td>
<td></td>
</tr>
<tr>
<td>Year 2</td>
<td>Spring</td>
<td>BMI 7000+</td>
<td>Advanced Biomedical Informatics Coursework</td>
<td>3</td>
<td>AU, SP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ETHICS COURSE</td>
<td></td>
<td>2-3</td>
<td>AU, SP</td>
<td></td>
</tr>
</tbody>
</table>

**Grade Policy:**
In addition to the general Graduate School requirements of a cumulative grade point average of 3.0 or higher, students must meet specific college policies regarding grades in Foundation and specialization courses. Students should familiarize themselves with Section 11 of the College of Public Health Graduate Student Handbook.

**College of Public Health - Office of Academic Programs and Student Services (OAPSS)**
OAPSS staff are available to provide assistance with College, Graduate School and University policies and procedures. (614) 292-8350/100 Cunz Hall/1841 Neil Ave/Columbus, Ohio/ 43210/cph.osu.edu

---

1. A sample 3 year program is available by request from the Department of Biomedical Informatics. Please contact bmi.education@osumc.edu

****Questions regarding the student's program of study should be directed to the advisor****