Mיקרология Подготовка по специальности (BS, HBS)

Administered by the Department of Microbiology under the School of Life Sciences.

The undergraduate BS degree in Microbiology (MB) is designed for students seeking a focused education in the field of microbiology. The major consists of a comprehensive core with a strong biological and physical science foundation combined with select fundamental courses in microbiology, followed by the completion of a number of upper division microbiology courses selected by each student based on their specific interests. The Microbiology major integrates a number of laboratory classes, providing students with a wide variety of hands-on experiences. Students can also choose to do microbiology research in a number of laboratories on campus. Microbiology majors receive excellent training for a variety of professional programs, such as medical, dental, and pharmacy programs, as well as graduate school.

The Microbiology major has a built-in Chemistry minor. Students may also elect to complete one transcript-visible option in Pre-Medicine or Aquatic Microbiology. An option is not required. Options in the MB major require additional credits beyond the basic MB major, although most students can complete the MB degree requirements plus the additional course work for either option in four years. The Pre-Medicine option will help prepare a student for taking the standardized test required for medical school application (MCAT), as well as provide an additional perspective in the humanities that is valued by medical programs. The Aquatic Microbiology option takes advantage of an area of expertise by various researchers at OSU, exposing students to both fundamental concepts as well as unique perspectives related to microbiology in both freshwater and ocean systems.

To receive the BS degree in Microbiology, a student must complete all university baccalaureate core requirements plus departmental requirements included in the list below.

- Majors must have 36 credits in microbiology with a minimum GPA of 2.00.
- Majors must receive a C– or better in the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>or BI 211H</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>BI 212</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>or BI 212H</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>BI 213</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>or BI 213H</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
<td>4</td>
</tr>
<tr>
<td>or CH 231H</td>
<td>GENERAL CHEMISTRY</td>
<td>4</td>
</tr>
<tr>
<td>CH 261</td>
<td>*LABORATORY FOR CHEMISTRY 231</td>
<td>1</td>
</tr>
<tr>
<td>or CH 261H</td>
<td>*LABORATORY FOR CHEMISTRY 231H</td>
<td>1</td>
</tr>
<tr>
<td>CH 232</td>
<td>GENERAL CHEMISTRY</td>
<td>4</td>
</tr>
<tr>
<td>or CH 232H</td>
<td>GENERAL CHEMISTRY</td>
<td>4</td>
</tr>
<tr>
<td>CH 262</td>
<td>*LABORATORY FOR CHEMISTRY 232</td>
<td>1</td>
</tr>
<tr>
<td>or CH 262H</td>
<td>*LABORATORY FOR CHEMISTRY 232H</td>
<td>1</td>
</tr>
<tr>
<td>CH 233</td>
<td>GENERAL CHEMISTRY</td>
<td>4</td>
</tr>
</tbody>
</table>

or CH 233H | GENERAL CHEMISTRY | 4 |

or CH 263H | *LABORATORY FOR CHEMISTRY 233H | 1 |

CH 331 | ORGANIC CHEMISTRY | 4 |

MTH 251 | *DIFFERENTIAL CALCULUS | 4 |

Total credits required for graduation | 180 |

- MB 401 RESEARCH, MB 403 THESIS, and MB 405 READING AND CONFERENCE cannot account for more than 3 of the required 36 microbiology credits.
- MB 406 SPECIAL PROJECTS can account for an additional 3 microbiology credits.
- Additional credits in these subjects will count toward elective credits.
- All required science courses must be taken for a grade.
- CH 324 QUANTITATIVE ANALYSIS may be taken with S/U grading; however, if taken S/U, the student will not receive a chemistry minor.
- 22 credits must come from the approved 400-level microbiology courses; to include MB 490 MICROBIOLOGY CAPSTONE EXPERIENCE (2 credits) and 2 credits from 400-level laboratory courses.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 211 &amp; BI 212 &amp; BI 213</td>
<td>*PRINCIPLES OF BIOLOGY and *PRINCIPLES OF BIOLOGY and *PRINCIPLES OF BIOLOGY</td>
<td>12</td>
</tr>
<tr>
<td>CH 231 &amp; CH 261</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 231</td>
<td>5</td>
</tr>
<tr>
<td>CH 232 &amp; CH 262</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 232</td>
<td>5</td>
</tr>
<tr>
<td>CH 233 &amp; CH 263</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 233</td>
<td>5</td>
</tr>
<tr>
<td>MB 110</td>
<td>ORIENTATION TO MICROBIOLOGY</td>
<td>1</td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 252 or MTH 268</td>
<td>INTEGRAL CALCULUS or MATHEMATICAL IDEAS IN BIOLOGY</td>
<td>4</td>
</tr>
</tbody>
</table>

Fitness | |
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speech</td>
<td>Microbiology Undergraduate Major (BS, HBS)</td>
<td>3</td>
</tr>
<tr>
<td>Writing I</td>
<td>Microbiology Undergraduate Major (BS, HBS)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Second Year</strong></td>
<td></td>
<td><strong>Hours</strong> 45</td>
</tr>
<tr>
<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>CH 331 &amp; CH 332</td>
<td>ORGANIC CHEMISTRY and ORGANIC CHEMISTRY</td>
<td>8</td>
</tr>
<tr>
<td>CH 337</td>
<td>ORGANIC CHEMISTRY LABORATORY</td>
<td>4</td>
</tr>
<tr>
<td>MB 302</td>
<td>GENERAL MICROBIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>MB 303</td>
<td>GENERAL MICROBIOLOGY LABORATORY</td>
<td>2</td>
</tr>
<tr>
<td>PH 201 &amp; PH 202 &amp; PH 203</td>
<td>*GENERAL PHYSICS and *GENERAL PHYSICS</td>
<td>15</td>
</tr>
<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
<td>4</td>
</tr>
<tr>
<td>Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Writing II</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Third Year</strong></td>
<td></td>
<td><strong>Hours</strong> 46</td>
</tr>
<tr>
<td>BB 450</td>
<td>GENERAL BIOCHEMISTRY</td>
<td>4</td>
</tr>
<tr>
<td>BB 451</td>
<td>GENERAL BIOCHEMISTRY</td>
<td>3</td>
</tr>
<tr>
<td>CH 324</td>
<td>QUANTITATIVE ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>MB 310</td>
<td>BACTERIAL MOLECULAR GENETICS</td>
<td>3</td>
</tr>
<tr>
<td>MB 311</td>
<td>*MOLECULAR MICROBIOLOGY LAB: A WRITING INTENSIVE COURSE</td>
<td>3</td>
</tr>
<tr>
<td>MB 312</td>
<td>BACTERIAL PHYSIOLOGY AND METABOLISM</td>
<td>3</td>
</tr>
<tr>
<td>Perspectives</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Synthesis</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Fourth Year</strong></td>
<td></td>
<td><strong>Hours</strong> 44</td>
</tr>
<tr>
<td>MB 490</td>
<td>MICROBIOLOGY CAPSTONE EXPERIENCE</td>
<td>2</td>
</tr>
<tr>
<td>MB 491/FW 491</td>
<td>FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE</td>
<td>15</td>
</tr>
<tr>
<td>MB 496</td>
<td>FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE LAB</td>
<td>6</td>
</tr>
<tr>
<td>MB 499</td>
<td>SPECIAL TOPICS</td>
<td>23</td>
</tr>
<tr>
<td>Other courses</td>
<td></td>
<td><strong>Hours</strong> 45</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td>180</td>
</tr>
</tbody>
</table>

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

**Major Code: 570**
<table>
<thead>
<tr>
<th>First Year</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 211 &amp; BI 212 &amp; BI 213</td>
<td>*PRINCIPLES OF BIOLOGY and *PRINCIPLES OF BIOLOGY and *PRINCIPLES OF BIOLOGY</td>
<td>12</td>
</tr>
<tr>
<td>CH 231 &amp; CH 261</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 231</td>
<td>5</td>
</tr>
<tr>
<td>CH 232 &amp; CH 262</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 232</td>
<td>5</td>
</tr>
<tr>
<td>MB 110</td>
<td>ORIENTATION TO MICROBIOLOGY</td>
<td>1</td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 252 or MTH 268</td>
<td>INTEGRAL CALCULUS or MATHEMATICAL IDEAS IN BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>Fitness</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Speech</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Writing I</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Year</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>CH 331 &amp; CH 332</td>
<td>ORGANIC CHEMISTRY and ORGANIC CHEMISTRY</td>
<td>8</td>
</tr>
<tr>
<td>CH 337</td>
<td>ORGANIC CHEMISTRY LABORATORY</td>
<td>4</td>
</tr>
<tr>
<td>MB 302</td>
<td>GENERAL MICROBIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>MB 303</td>
<td>GENERAL MICROBIOLOGY LABORATORY</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Third Year</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB 450</td>
<td>GENERAL BIOCHEMISTRY</td>
<td>4</td>
</tr>
<tr>
<td>BB 451</td>
<td>GENERAL BIOCHEMISTRY</td>
<td>3</td>
</tr>
<tr>
<td>CH 324</td>
<td>QUANTITATIVE ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>MB 310</td>
<td>BACTERIAL MOLECULAR GENETICS</td>
<td>3</td>
</tr>
<tr>
<td>MB 311</td>
<td>*MOLECULAR MICROBIOLOGY LAB: A WRITING INTENSIVE COURSE</td>
<td>3</td>
</tr>
<tr>
<td>MB 312</td>
<td>BACTERIAL PHYSIOLOGY AND METABOLISM</td>
<td>3</td>
</tr>
<tr>
<td>Perspectives</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Synthesis</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Elective</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fourth Year</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB 490</td>
<td>MICROBIOLOGICAL CAPSTONE EXPERIENCE</td>
<td>2</td>
</tr>
</tbody>
</table>

Select 20 credits from the approved 400-level microbiology courses below (2 credits of which must come from 400-level laboratory courses):

<p>| MB 401 | RESEARCH | |
| MB 405 | READING AND CONFERENCE | |
| MB 406 | SPECIAL PROJECTS | |
| MB 407 | SEMINAR | |
| MB 410 | OCCUPATIONAL INTERNSHIP | |
| MB 416 | IMMUNOLOGY | |
| MB 417 | IMMUNOLOGY LABORATORY | |
| MB 420 | MICROBIAL GENOMES, BIOGEOCHEMISTRY, AND DIVERSITY | |
| MB 430 | BACTERIAL PATHOGENESIS | |
| MB 434 | VIROLOGY | |
| MB 435 | PATHOGENESIS MICROBES LABORATORY | |</p>
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB 436</td>
<td>THE HUMAN MICROBIOME</td>
</tr>
<tr>
<td>MB 440</td>
<td>FOOD MICROBIOLOGY</td>
</tr>
<tr>
<td>MB 441</td>
<td>FOOD MICROBIOLOGY LABORATORY</td>
</tr>
<tr>
<td>MB 448</td>
<td>MICROBIAL ECOLOGY</td>
</tr>
<tr>
<td>MB 456</td>
<td>MICROBIAL GENETICS AND BIOTECHNOLOGY</td>
</tr>
<tr>
<td>MB 479/FST 479</td>
<td>FERMENTATION MICROBIOLOGY</td>
</tr>
<tr>
<td>MB 480</td>
<td>GENERAL PARASITOLOGY</td>
</tr>
<tr>
<td>MB 491/FW 491</td>
<td>FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE</td>
</tr>
<tr>
<td>MB 496</td>
<td>FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE LAB</td>
</tr>
<tr>
<td>MB 499</td>
<td>SPECIAL TOPICS</td>
</tr>
</tbody>
</table>

**Hours** 22

**Total Hours** 157

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

**Note:** Microbiology majors planning advanced professional training in medicine, should consult a pre-medical, clinical lab science or other appropriate advisor.