MICROBIOLOGY B.S.

Bachelor of Science - Microbiology

College Humanities & Sciences

Degree Specific Credits: 91

Required Cumulative GPA: 2.0

Catalog Year: 2017-2018

Note: Microbiology is the study of microorganisms including bacteria, fungi, viruses, and protozoa. This general microbiology concentration emphasizes microbial structure and function, as well as interactions with humans. This is a graduate prep program, and is appropriate for students interested in research careers in academia or private or government laboratories. It is also an excellent concentration for pre-medical sciences students.

General Education Requirements

Information regarding these requirements can be found in the General Education Section (http://catalog.umt.edu/academics/general-education-requirements) of the catalog.

Summary

Biology/Microbiology Lower Division Core 17
Upper Division Microbiology Core Courses 19
Additional UD Major Courses Required for Microbiology 11-15
Biochemistry
Additional UD Depth Courses in Microbiology 42
Chemistry
Physics
Upper Division Writing Expectation for the Major 2-7
Total Hours 91-100

Biology/Microbiology Lower Division Core

Rule: All of the following courses are required.

Note: The lower division core should be completed before attempting most upper division major courses.

AP Biology credit may be substituted for either BIOB 160N/BIOB 161N or BIOB 170N/BIOB 171N.

BIOB 160N Principles of Living Systems 3
BIOB 161N Prcnpls of Living Systems Lab 1
BIOB 170N Prncpals Biological Diversity 3
BIOB 171N Prncpals Biological Dvrsty Lab 2
BIOB 260 Cellular and Molecular Biology 4
BIOB 272 Genetics and Evolution 4
Total Hours 17

Minimum Required Grade: C-

Upper Division Microbiology Core Courses

Rule: All of the following courses are required.

BIOM 360 General Microbiology 3
BIOM 361 General Microbiology Lab 2
BIOM 410 Microbial Genetics 3
BIOM 411 Exprmntl Microbial Genetcs Lab 1
BIOM 415 Microbial Dvrsty Eclgy & Evltn 3
BIOM 450 Microbial Physiology 3
BIOM 451 Microbial Physiology Lab 1
Total Hours 16

Minimum Required Grade: C-

Additional UD Major Courses Required for Microbiology

Minimum Required Grade: C-

Biochemistry

Select either one semester or one year of biochemistry from the following:

One Semester:
BCH 380 Biochemistry

One Year:
BCH 480 Advanced Biochemistry I
BCH 482 Advanced Biochemistry II

Total Hours 4-6

Minimum Required Grade: C-

Additional UD Depth Courses in Microbiology

Select 10-12 credits from the following (labs must be taken if available):

BIOM 402 Medical Bacteriology & Mycol for
& BIOM 403 Medical Bacteriology & Mycoly Lb
BIOM 407 Clinical Diagnosis
& BIOM 408 and Clinical Diagnosis Lab
BIOM 427 General Parasitology
& BIOM 428 and General Parasitology Lab
BIOM 435 Virology
BIOM 490 Adv Undergrad Research

Total Hours 10-12

Minimum Required Grade: C-

Required Courses Outside of the Major

Minimum Required Grade: C-

Mathematics

Rule: All of the following courses are required.
### Microbiology B.S.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 162</td>
<td>Applied Calculus</td>
<td>4</td>
</tr>
<tr>
<td>or M 171</td>
<td>Calculus I</td>
<td></td>
</tr>
<tr>
<td>STAT 216</td>
<td>Introduction to Statistics</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td><strong>8</strong></td>
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</table>

Minimum Required Grade: C-

### Chemistry

**Rule:** All of the following courses are required.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>CHMY 141N</td>
<td>College Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHMY 142N</td>
<td>College Chemistry I Lab</td>
<td>1</td>
</tr>
<tr>
<td>CHMY 143N</td>
<td>College Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>CHMY 144N</td>
<td>College Chemistry II Lab</td>
<td>1</td>
</tr>
<tr>
<td>CHMY 221</td>
<td>Organic Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHMY 222</td>
<td>Organic Chemistry I Lab</td>
<td>2</td>
</tr>
<tr>
<td>CHMY 223</td>
<td>Organic Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHMY 224</td>
<td>Organic Chemistry II Lab</td>
<td>2</td>
</tr>
<tr>
<td>CHMY 311</td>
<td>Analytical Chem-Quant Analysis</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td><strong>24</strong></td>
</tr>
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</table>

Minimum Required Grade: C-

### Physics

**Rule:** All of the following courses are required.

Select one of the following physics sequences: 10

**Algebra- and Trigonometry-based:**

- PHSX 205N College Physics I
- & PHSX 206N College Physics I Laboratory

- PHSX 207N College Physics II
- & PHSX 208N College Physics II Laboratory

**Calculus-based:**

- PHSX 215N Fund of Physics w/Calc I
- & PHSX 216N and Physics Laboratory I w/Calc

- PHSX 217N Fund of Physics w/Calc II
- & PHSX 218N and Physics Laboratory II w/Calc

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<tbody>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td><strong>10</strong></td>
</tr>
</tbody>
</table>

Minimum Required Grade: C-

### Advanced College Writing Requirement

**Rule:** Complete the equivalent of a full writing course (either three 1/3 writing courses or one 2/3 writing course + one 1/3 writing course or one complete writing course)

**Note:** To meet the Advanced College Writing Requirement, Microbiology students take at least 2 partial writing courses. The Microbiology degree requires one 2/3 writing course (BIOM 411). The Advanced College Writing Requirement is completed with one more course, chosen from any of the following:

Minimum Required Grade: C-

#### 1/3 Advanced Writing Courses

<table>
<thead>
<tr>
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<th>Hours</th>
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<tbody>
<tr>
<td>BCH 482</td>
<td>Advanced Biochemistry II</td>
<td>3</td>
</tr>
<tr>
<td>BIOB 410</td>
<td>Immunology</td>
<td>3</td>
</tr>
<tr>
<td>BIOB 425</td>
<td>Adv Cell &amp; Molecular Biology</td>
<td>3</td>
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</table>

#### 2/3 Advanced Writing Courses

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<thead>
<tr>
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<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BCH 486</td>
<td>Biochemistry Research Lab</td>
<td>3</td>
</tr>
<tr>
<td>BCH 499</td>
<td>Senior Thesis/Capstone</td>
<td>3-6</td>
</tr>
<tr>
<td>BIOE 411</td>
<td>Immunology Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>BIOE 499</td>
<td>Undergraduate Thesis</td>
<td>3-6</td>
</tr>
<tr>
<td>BIOE 342</td>
<td>Field Ecology</td>
<td>5</td>
</tr>
<tr>
<td>BIOE 371</td>
<td>Gen Ecology Lab (equiv to 271)</td>
<td>2</td>
</tr>
<tr>
<td>BIOM 411</td>
<td>Exprmntl Microbial Genetcs Lab</td>
<td>1</td>
</tr>
<tr>
<td>BIOM 499</td>
<td>Undergraduate Thesis</td>
<td>3-6</td>
</tr>
</tbody>
</table>

Minimum Required Grade: C-

### Complete Advanced Writing Course

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<tbody>
<tr>
<td>BIOH 462</td>
<td>Principles Medical Physiology</td>
<td>3</td>
</tr>
</tbody>
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#### Exception to the Modern/Classical Languages Requirement

**Rule:** Choose one of the following Math courses

**Note:** The Division of Biological Sciences has been granted an exception to the Modern/Classical Language Requirement. Either of these Calculus courses (required by the major) will satisfy this requirement.

[**M 162**](#) Applied Calculus 4

[**or M 171**](#) Calculus I 4

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