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
Required Courses Outside of the Major 42
  Mathematics
  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 Pncpals of Living Systems Lab 1
BIOB 170N Princpls Biological Diversity 3
BIOB 171N Prncipls 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: 4-6
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): 10-12

BIOB 410 & BIOB 411 Immunology and Immunology Laboratory
BIOB 483 Phylgenics and Evolution
BIOE 370 General Ecology
BIOH 405 Hematology
BIOM 402 Medical Bacteriology & Mycology
  & BIOM 403 and Medicl Bacteriolgy & Myclgy 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.
M 162  Applied Calculus  4  
 or M 171  Calculus I  
STAT 216  Introduction to Statistics  4  
Total Hours  8  
Minimum Required Grade: C-

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</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>
</tbody>
</table>
Total Hours  24  
Minimum Required Grade: C-

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

Select one of the following physics sequences:  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHSX 205N &amp; PHSX 206N</td>
<td>College Physics I and College Physics I Laboratory</td>
<td>10</td>
</tr>
<tr>
<td>PHSX 207N &amp; PHSX 208N</td>
<td>College Physics II and College Physics II Laboratory</td>
<td>10</td>
</tr>
<tr>
<td>PHSX 215N &amp; PHSX 216N</td>
<td>Fund of Physics w/Calc I and Physics Laboratory I w/Calc</td>
<td>10</td>
</tr>
<tr>
<td>PHSX 217N &amp; PHSX 218N</td>
<td>Fund of Physics w/Calc II and Physics Laboratory II w/Calc</td>
<td>10</td>
</tr>
</tbody>
</table>

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-

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOB 483</td>
<td>Phylogenics and Evolution</td>
<td>3</td>
</tr>
<tr>
<td>BIOE 403</td>
<td>Vert Design &amp; Evolution</td>
<td>5</td>
</tr>
<tr>
<td>BIOE 409</td>
<td>Behavior &amp; Evolution Discussion</td>
<td>1</td>
</tr>
<tr>
<td>BIOE 428</td>
<td>Freshwater Ecology</td>
<td>5</td>
</tr>
<tr>
<td>BIOL 484</td>
<td>Plant Evolution</td>
<td>3</td>
</tr>
<tr>
<td>BIOM 402</td>
<td>Medical Bacteriology&amp; Mycology</td>
<td>3</td>
</tr>
<tr>
<td>BIOM 320</td>
<td>General Botany</td>
<td>5</td>
</tr>
<tr>
<td>BIOM 434</td>
<td>Plant Physiology Lab</td>
<td>1</td>
</tr>
<tr>
<td>BIOO 470</td>
<td>Ornithology</td>
<td>4</td>
</tr>
<tr>
<td>BIOO 475</td>
<td>Mammalogy</td>
<td>4</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>

Complete Advanced Writing Course  

Minimum Required Grade: C-

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  
Total Hours  4  
Minimum Required Grade: C-