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 Pncpls of Living Systems Lab 1
BIOB 170N Princpls Biological Diversity 3
BIOB 171N Princpls 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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOM 360</td>
<td>General Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>BIOM 361</td>
<td>General Microbiology Lab</td>
<td>2</td>
</tr>
<tr>
<td>BIOM 410</td>
<td>Microbial Genetics</td>
<td>3</td>
</tr>
<tr>
<td>BIOM 411</td>
<td>Exprmntl Microbial Genetcs Lab</td>
<td>1</td>
</tr>
<tr>
<td>BIOM 415</td>
<td>Microbial Dvrsty Ecly &amp; Evltn</td>
<td>3</td>
</tr>
<tr>
<td>BIOM 450</td>
<td>Microbial Physiology</td>
<td>3</td>
</tr>
<tr>
<td>BIOM 451</td>
<td>Microbial Physiology Lab</td>
<td>1</td>
</tr>
</tbody>
</table>

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):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BIO 410</td>
<td>Immunology &amp; Immunology Laboratory</td>
<td></td>
</tr>
<tr>
<td>BIO 483</td>
<td>Phylgenics and Evolution</td>
<td></td>
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<tr>
<td>BIO E 370</td>
<td>General Ecology</td>
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<tr>
<td>BIO H 405</td>
<td>Hematology</td>
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<tr>
<td>BIO M 402</td>
<td>Medical Bacteriology &amp; Mycology</td>
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<tr>
<td>&amp; BIO M 403</td>
<td>and Medical Bacteriology &amp; Myclogy Lb</td>
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<tr>
<td>BIO M 407</td>
<td>Clinical Diagnosis</td>
<td></td>
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<tr>
<td>&amp; BIO M 408</td>
<td>and Clinical Diagnosis Lab</td>
<td></td>
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<tr>
<td>BIO M 427</td>
<td>General Parasitology</td>
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<tr>
<td>&amp; BIO M 428</td>
<td>and General Parasitology Lab</td>
<td></td>
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<tr>
<td>BIO M 435</td>
<td>Virology</td>
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<tr>
<td>BIO M 490</td>
<td>Adv Undergrad Research</td>
<td></td>
</tr>
</tbody>
</table>

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.

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.

CHMY 141N  College Chemistry I  4
CHMY 142N  College Chemistry I Lab  1
CHMY 143N  College Chemistry II  4
CHMY 144N  College Chemistry II Lab  1
CHMY 221  Organic Chemistry I  3
CHMY 222  Organic Chemistry I Lab  2
CHMY 223  Organic Chemistry II  3
CHMY 224  Organic Chemistry II Lab  2
CHMY 311  Analytical Chem-Quant Analysis  4
Total Hours  24
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

Total Hours  10
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

BCH 482  Advanced Biochemistry II  3
BIOB 410  Immunology  3
BIOB 425  Adv Cell & Molecular Biology  3

2/3 Advanced Writing Courses

BCH 486  Biochemistry Research Lab  3
BCH 499  Senior Thesis/Capstone  3-6
BIOB 411  Immunology Laboratory  2
BIOB 499  Undergraduate Thesis  3-6
BIOE 342  Field Ecology  5
BIOE 371  Gen Ecology Lab (equiv to 271)  2
BIOM 411  Exptrmntl Microbial Genetcs Lab  1
BIOM 499  Undergraduate Thesis  3-6

Minimum Required Grade: C-

Complete Advanced Writing Course

BIOH 462  Principles Medical Physiology  3

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

Total Hours  4
Minimum Required Grade: C-