# 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 ([link](http://catalog.umt.edu/academics/general-education-requirements)) of the catalog.

## Summary

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## 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.

<table>
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<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>BIOB 160N</td>
<td>Principles of Living Systems</td>
<td>3</td>
</tr>
<tr>
<td>BIOB 161N</td>
<td>Pncplns of Living Systems Lab</td>
<td>1</td>
</tr>
<tr>
<td>BIOB 170N</td>
<td>Prncpl Biological Diversity</td>
<td>3</td>
</tr>
<tr>
<td>BIOB 171N</td>
<td>Prncpl Biological Dvrsy Lab</td>
<td>2</td>
</tr>
<tr>
<td>BIOB 260</td>
<td>Cellular and Molecular Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIOB 272</td>
<td>Genetics and Evolution</td>
<td>4</td>
</tr>
</tbody>
</table>

**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 credits
- BIOM 361 General Microbiology Lab 2 credits
- BIOM 410 Microbial Genetics 3 credits
- BIOM 411 Exprmntl Microbial Genetcs Lab 1 credit
- BIOM 415 Microbial Dvrsty Eclyg & Evltn 3 credits
- BIOM 450 Microbial Physiology 3 credits
- BIOM 451 Microbial Physiology Lab 1 credit

**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):

- BIOB 410 & BIOB 411 Immunology & Immunology Laboratory
- BIOB 483 Phylogenics and Evolution
- BIOE 370 General Ecology
- BIOH 405 Hematology
- BIOI 402 Medical Bacteriology & Mycology
- & BIOI 403 and Medical Bacteriology & Mycology Lb
- BIOI 407 Clinical Diagnosis & BIOI 408 and Clinical Diagnosis Lab
- BIOI 427 General Parasitology & BIOI 428 and General Parasitology Lab
- BIOI 435 Virology
- BIOI 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.

<table>
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<tr>
<th>Course</th>
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</table>
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 & PHSX 206N
College Physics I and College Physics I Laboratory
PHSX 207N & PHSX 208N
College Physics II and College Physics II Laboratory
Calculus-based:
PHSX 215N & PHSX 216N
Fund of Physics w/Calc I and Physics Laboratory I w/Calc
PHSX 217N & PHSX 218N
Fund of Physics w/Calc II 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 Exprmntl 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 4
Total Hours 4
Minimum Required Grade: C-