

# 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	Prncpls of Living Systems Lab	1
BIOB 170N	Prncpls Biological Diversity	3
BIOB 171N	Prncpls 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	Phylogenics and Evolution	
BIOE 370	General Ecology	
BIOH 405	Hematology	
BIOM 402 & BIOM 403	Medical Bacteriology & Mycology and Medicl Bacteriolgy & Myclgy Lb	
BIOM 407 & BIOM 408	Clinical Diagnosis and Clinical Diagnosis Lab	
BIOM 427 & BIOM 428	General Parasitology 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.

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	and College Physics I Laboratory
PHSX 207N	College Physics II
& PHSX 208N	and 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

BIOB 483	Phylogenics and Evolution	3
BIOE 403	Vert Design & Evolution	5
BIOE 409	Behavior & Evolution Discussion	1
BIOE 428	Freshwater Ecology	5
BIOL 484	Plant Evolution	3
BIOM 402	Medical Bacteriology& Mycology	3
BIOO 320	General Botany	5
BIOO 434	Plant Physiology Lab	1
BIOO 470	Ornithology	4
BIOO 475	Mammalogy	4

Minimum Required Grade: C-

### 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
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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	
Total Hours		4

Minimum Required Grade: C-