# **MICROBIOLOGY B.S.**

# **Bachelor of Science - Microbiology**

# **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

Code	Title	Hours
Biology/Microbiolo	17	
Upper-Division Mic	robiology Core Courses	16
Additional Upper-Division Major Courses Required for Microbiology		16
Biochemistry		
Additional Uppe	r-Division Depth Courses in Microbiology	
Required Courses Outside of the Major		42
Mathematics		
Chemistry		
Physics		
Advanced College	Writing Requirement	
Total Hours		91

Degree Specific Credits: 91

### **Required Cumulative GPA: 2.0**

**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.

## **Biology/Microbiology Lower-Division Core**

**Note**: The lower-division core should be completed before attempting most upper-division major courses. AP Biology credit with a score of 3 may be substituted for either BIOB 160N/BIOB 161N or BIOB 170N/BIOB 171N.

Code	Title	Hours
Complete all of the	ne following courses:	
BIOB 160N	Principles of Living Systems	3
BIOB 161N	Principles of Living Systems Lab	1
BIOB 170N	Principles of Biological Diversity	3
BIOB 171N	Principles of Biological Diversity 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**

Code	Title	Hours	
Complete all of the following courses:			
BIOM 360	General Microbiology	3	
BIOM 361	General Microbiology Lab	2	
BIOM 410	Microbial Genetics	3	
BIOM 411	Experimental Microbial Genetics Lab	1	
BIOM 415	Microbial Diversity Ecology & Evolution	3	
BIOM 450	Microbial Physiology	3	
BIOM 451	Microbial Physiology Lab	1	
Total Hours		16	

Minimum Required Grade: C-

Additional Up Microbiology	pper-Division Courses Required for	
Biochemistry		
Code	Title	Hours
Complete either o courses:	one semester or one year of Biochemistry	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 Upper-Division Depth Courses in Microbiology Hours Code Title Hours Complete 10-12 credits from the following courses (labs 10-12

must be taken if available). 10 credits if BCH 480-482 was taken; 12 credits if BCH 380 was taken.

Total Hours		10-12
BIOM 490	Advanced Undergraduate Research	
BIOM 460	Ecology of Infectious Diseases	
BIOM 435	Virology	
BIOM 427 & BIOM 428	General Parasitology and General Parasitology Lab	
BIOM 420	Host-Microbe Interactions	
BIOM 407 & BIOM 408	Clinical Diagnosis and Clinical Diagnosis Lab	
BIOM 402 & BIOM 403	Pathogenic Microbes and Pathogenic Microbes Laboratory	
BIOH 405	Hematology	
BIOE 370	General Ecology	
BIOB 483	Phylogenics and Evolution	
BIOB 410 & BIOB 411	Immunology and Immunology Laboratory	

Minimum Required Grade: C-

## **Required Courses Outside of the Major**

Mathematics		
Code	Title	Hours
Complete one of	f the following courses:	4
M 162	Applied Calculus	
M 171	Calculus I	
Total Hours		4
Minimum Requir	red Grade: C-	
Statistics		
Code	Title	Hours
Complete the fo	llowing course:	
STAT 216	Introduction to Statistics	4
Total Hours		4
Minimum Requir	red Grade: C-	
Chemistry		
Code	Title	Hours
Complete all of t	the following courses:	
CHMY 141N & CHMY 142N	College Chemistry I and College Chemistry I Lab	5
CHMY 143N	College Chemistry II	5

& CHMY 144N and College Chemistry II Lab CHMY 221 Organic Chemistry I and Organic Chemistry I Lab & CHMY 222 **CHMY 223** Organic Chemistry II & CHMY 224 and Organic Chemistry II Lab CHMY 311 Analytical Chemistry-Quantitative Analysis **Total Hours** 24

Minimum Required Grade: C-

#### **Physics**

Code	Title	Hours
Complete one of t	he following Physics sequences:	10
Algebra- and T	rigonometry-based Physics:	
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	l Physics:	
PHSX 215N & PHSX 216N	Fundamentals of Physics with Calculus I and Physics Laboratory I with Calculus	
PHSX 217N & PHSX 218N	Fundamentals of Physics with Calculus II and Physics Laboratory II with Calculus	
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). 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.

1/3 Advanced Writing Courses			
Code	Title	Hours	
BCH 482	Advanced Biochemistry II	3	
BIOB 410	Immunology	3	
BIOB 425	Advanced Cellular & Molecular Biology	3	
BIOB 483	Phylogenics and Evolution	3	
BIOE 403	Comparative Vertebrate Anatomy	4	
BIOE 409	Behavior & Evolution Discussion	1	
BIOE 428	Freshwater Ecology	5	
BIOM 402	Pathogenic Microbes	3	
BIOO 320	General Botany	5	
BIOO 434	Plant Physiology Lab	1	
BIOO 470	Ornithology	4	
BIOO 475	Mammalogy	4	

Minimum Required Grade: C-

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### 2/3 Advanced Writing Courses

Code	Title	Hours
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	General Ecology Lab (equivalent to 271)	2
BIOM 411	Experimental Microbial Genetics Lab	1
BIOM 499	Undergraduate Thesis	3-6

Minimum Required Grade: C-

### **Complete Advanced Writing Course**

Code	Title	Hours
BIOH 462	Principles of Medical Physiology	3
BIOM 420	Host-Microbe Interactions	3

Minimum Required Grade: C-