

MICROBIOLOGY B.S.

General Degree Requirements

To earn a baccalaureate degree, all students must complete successfully, in addition to any other requirements, the University of Montana General Education Requirements. Please refer to the General Education Requirements page (<https://catalog.umt.edu/academics/general-education-requirements/>) for more information.

Additional requirements for graduation can be found on the Degree/Certificate Requirements for Graduation page (<https://catalog.umt.edu/academics/graduation-requirements/>).

Unless otherwise noted in individual program requirements, a minimum grade point average of 2.00 in all work attempted at the University of Montana-Missoula is required for graduation. Please see the Academic Policies and Procedures page (<https://catalog.umt.edu/academics/policies-procedures/>) for information on how your GPA is calculated.

Courses taken to satisfy the requirements of a major, minor, or certificate program must be completed with a grade of C- or better unless a higher grade is noted in the program requirements.

BACHELOR OF SCIENCE - MICROBIOLOGY

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.

Course Requirements

Code	Title	Hours
Biology/Microbiology Lower-Division Core		
Complete all of the following courses:		
BIOB 160	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
Upper-Division Microbiology Core Courses		
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
Biochemistry		
Complete either one semester or one year of Biochemistry courses:		4-6
BCH 380	Biochemistry	

or BCH 480 Advanced Biochemistry I
& BCH 482 and Advanced Biochemistry II

Additional Upper-Division Depth Courses in Microbiology

Complete 10-12 credits from the following courses (labs must be taken if available). 10 credits if BCH 480/BCH 482 was taken; 12 credits if BCH 380 was taken. 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	Pathogenic Microbes and Pathogenic Microbes Laboratory	
BIOM 407 & BIOM 408	Clinical Diagnosis and Clinical Diagnosis Lab	
BIOM 420	Host-Microbe Interactions	
BIOM 427 & BIOM 428	General Parasitology and General Parasitology Lab	
BIOM 435	Virology	
BIOM 460	Ecology of Infectious Diseases	
BIOM 490	Advanced Undergraduate Research	

Mathematics

Complete all of the following courses:

M 162 or M 171	Applied Calculus Calculus I	4
STAT 216	Introduction to Statistics	4

Chemistry

CHMY 141N & CHMY 142N	College Chemistry I and College Chemistry I Lab	5
CHMY 143N & CHMY 144N	College Chemistry II and College Chemistry II Lab	5
CHMY 221 & CHMY 222	Organic Chemistry I and Organic Chemistry I Lab	5
CHMY 223 & CHMY 224	Organic Chemistry II and Organic Chemistry II Lab	5
CHMY 311	Analytical Chemistry-Quantitative Analysis	4

Physics

Complete one of the following Physics sequences: 10

Algebra- and Trigonometry-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 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	

Advanced Writing Requirement

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 Writing Requirement is completed with one more course chosen from any of the courses on the list below.

Total Hours **92-96**

1

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 160/BIOB 161N or BIOB 170N/BIOB 171N.

Advanced Writing Distributed Model Courses for Biological Sciences

Code	Title	Hours
1/3 Advanced Writing Courses		
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 428	Freshwater Ecology	0,5
BIOM 402	Pathogenic Microbes	3
BIOO 320	General Botany	5
BIOO 434	Plant Physiology Lab	1
BIOO 470	Ornithology	4
BIOO 475	Mammalogy	4
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	General Ecology Lab (equivalent to 271)	2
BIOM 411	Experimental Microbial Genetics Lab	1
BIOM 499	Undergraduate Thesis	3-6
Complete Advanced Writing Course		
BIOH 462	Principles of Medical Physiology	3
BIOM 420	Host-Microbe Interactions	3