INTEGRATIVE MICROBIOLOGY B.A.

Microbiology is the study of microorganisms including bacteria, fungi, viruses, and protozoa. The Integrative Microbiology major takes an interdisciplinary approach to the study of microbial structure and function and encourages the integration of microbiology with the study of other disciplines.

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 Arts - Integrative Microbiology

Course Requirements

Code	Title	Hours
Biology & Microbiology Core Courses [1]		
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
Major 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
Microbiology Electives		
Complete 9 credits of the following courses:		9
BIOB 410 & BIOB 411	Immunology and Immunology Laboratory	
BIOB 483	Phylogenics and Evolution	
BIOB 486	Genomics	
BIOE 400	Aquatic Microbial Ecology	
BIOM 327	Vector-Borne Diseases: Public Health Perspectives	
BIOM 402 & BIOM 403	Pathogenic Microbes and Pathogenic Microbes Laboratory	
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	
Chemistry		
Complete all of the following courses:		
BCH 380	Biochemistry	4
CHMY 121N	Introduction to General Chemistry	4
CHMY 123	Introduction to Organic and Biochemistry	4
CHMY 124	Introduction to Organic and Biochemistry Lab	2
Mathematics, Computer Science, Physics		
Complete two of the following courses. Only one may be in calculus.		7-10
CSCI 150	Introduction to Computer Science	
M 162 or M 171	Applied Calculus Calculus I	
M 172	Calculus II	
PHSX 205N & PHSX 206N	College Physics I and College Physics I Laboratory	
PHSX 207N & PHSX 208N	College Physics II and College Physics II Laboratory	
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	
STAT 216	Introduction to Statistics	
Integrative Science Electives		
Complete 9 credits of the following courses from any category:		9
Health Microbiology		
BIOH 365 & BIOH 366	Human Anatomy and Physiology for Health Professions I and Human Anatomy and Physiology for Health Professions I Laboratory	
BIOH 370 & BIOH 371	Human Anatomy and Physiology for Health Professions II and Human Anatomy and Physiology for Health Professions II Laboratory	
PUBH 155	Reimagining Global Health: Biosocial Perspectives	
PUBH 325	Environmental and Occupational Health	
Brewing/Oenology		
CHMY 311	Analytical Chemistry-Quantitative Analysis	

CHMY 313	Introduction to Brewing Science
CHMY 314	Brewing Science
Analytics/Programming	
CSCI 151	Interdisciplinary Computer Science I
CSCI 152	Interdisciplinary Computer Science II
CSCI 172	Intro to Computer Modeling
STAT 451 & STAT 457	Statistical Methods I and Computer Data Analysis I
STAT 452 & STAT 458	Statistical Methods II and Computer Data Analysis II
Water Microbiology	
ERTH 406	Global Water Crises
GEO 202	The Water Planet
GEO 421	Hydrology
NRSM 345	Watershed Dynamics and Management Issues
NRSM 385	Watershed Hydrology
Soil Microbiology	
NRSM 210N	Soils, Water and Climate
NRSM 211N	Soils and Water
NRSM 212N	Ecology, Physics and Taxonomy of Soils
NRSM 415	Environmental Soil Science
Writing in the Disciplines Requirement	
To complete the General Education Requirement for Writing in the Disciplines, Integrative Microbiology students can either take a complete writing course (in or outside of DBS) or partial writing courses (2-3) within the DBS Distributed Model.	
Total Hours	**72-75**

[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.

Writing in the Disciplines Distributed Model Courses for Biological Sciences

Code	Title	Hours
1/3 Writing in the Disciplines 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 371	General Ecology Lab (equivalent to 271)	2
BIOE 403	Comparative Vertebrate Anatomy	4
BIOE 428	Freshwater Ecology	5
BIOH 447	Genes and Development Lab	3
BIOM 327	Vector-Borne Diseases: Public Health Perspectives	3
BIOM 435	Virology	3
BIOO 470	Ornithology	4
BIOO 475	Mammalogy	4
WILD 470	Conservation of Wildlife Populations	4
2/3 Writing in the Disciplines 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 448	Terrestrial Plant Ecology	4
BIOE 485	Plant Evolution	3
BIOM 499	Undergraduate Thesis	3-6
Full Writing in the Disciplines Courses		
BIOH 462	Principles of Medical Physiology	3
BIOM 420	Host-Microbe Interactions	3

Four Year Plan

Course	Title	Hours
Freshman		
Autumn		
BIOB 160 & BIOB 161N	Principles of Living Systems and Principles of Living Systems Lab	4
CHMY 121N	Introduction to General Chemistry	4
M 162 or M 171	Applied Calculus or Calculus I	4
BIOB 194	Your Future in Biology	1
WRIT 101	College Writing I	4
	Hours	**17**
Spring		
BIOB 170N & BIOB 171N	Principles of Biological Diversity and Principles of Biological Diversity Lab	5
CHMY 123 & CHMY 124	Introduction to Organic and Biochemistry and Introduction to Organic and Biochemistry Lab	6
General Education Requirement		3
	Hours	**14**
Sophomore		
Autumn		
BIOB 260	Cellular and Molecular Biology	4
BIOM 360 & BIOM 361	General Microbiology and General Microbiology Lab	5
General Education Requirement		3
Elective		3
	Hours	**15**
Spring		
BIOB 272	Genetics and Evolution	4
CSCI 150	Introduction to Computer Science [1]	3
Intermediate Writing Course		3
General Education Requirement		3
Elective		1
	Hours	**14**
Junior		
Autumn		
BCH 380	Biochemistry	4
BIOM 327	Vector-Borne Diseases: Public Health Perspectives (General Education Requirement)	3
Integrative Science Elective		3
General Education Requirement		3
Upper Division Elective		3
	Hours	**16**
Spring		
BIOM 415	Microbial Diversity Ecology & Evolution	3
BIOM 460	Ecology of Infectious Diseases [1]	3
Integrative Science Elective		3
General Education Requirement		3

Elective		3
	Hours	**15**
Senior		
Autumn		
BIOM 450 & BIOM 451	Microbial Physiology and Microbial Physiology Lab	4
Upper Division Elective		4
Elective		7
	Hours	**15**
Spring		
BIOM 410 & BIOM 411	Microbial Genetics and Experimental Microbial Genetics Lab	4
BIOM 435	Virology [1]	3
Upper Division Elective		3
Elective		5
	Hours	**15**
	Total Hours	**121**

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[1] *Indicates you have a choice of alternative courses for degree completion. See catalog, Degree Works, or your advisor for other options.*