

BIOLOGY B.S. - ECOLOGY AND ORGANISMAL BIOLOGY

Bachelor of Science - Biology; Ecology and Organismal Biology Concentration

College of Humanities & Sciences

Degree Specific Credits: 69-85

Required Cumulative GPA: 2.0

Catalog Year: 2018-2019

Note: The Ecology and Organismal Biology concentration is for students interested in the biology of organisms (plants or animals) or the biology of populations or communities. Course offerings include those from organismal biology, ecology, evolutionary biology, and conservation biology. This concentration is a graduate prep program, and it is designed for students interested in academia or employment with government agencies (e.g. National Biological Survey, U.S. FWS, etc.), or environmental consulting agencies. This concentration is also an excellent choice for pre-veterinary 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

Code	Title	Hours
	Biology/Microbiology Lower-Division Core	17
	Upper-Division Core Courses Required by Ecology & Organismal Biology Concentration	5
	Additional Upper-Division Courses Required for the Ecology & Organismal Biology Concentration	21
	Organismal Course Requirement	
	-ology Course Requirement	
	Specialized Ecology Course Requirement	
	Evolution Course Requirement	
	Required Courses Outside of the Major	26-42
	Mathematics - Calculus	
	Mathematics - Statistics	
	Chemistry	
	Physics	
	Advanced College Writing Requirement	
	Total Hours	69-85

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 following courses:		
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 Core Courses Required by Ecology & Organismal Biology Concentration

Code	Title	Hours
Complete one of the following courses:		
BIOE 370 & BIOE 371	General Ecology and Gen Ecology Lab (equiv to 271)	5
BIOE 342	Field Ecology (taken at the Flathead Lake Biological Station)	
Total Hours		5

Minimum Required Grade: C-

Additional Upper-Division Courses Required for the Ecology & Organismal Biology Concentration

Rule: Complete a minimum of 21 credits of upper-division BIOB, BIOE, BIOH, BIOL, BIOM, BIOO, or BCH course, with at least one course from each of the following subcategories. Other recommended courses include BCH 380 or BCH 480-BCH 482. 21 total credits required

Organismal Course Requirement

Code	Title	Hours
Complete at least one organismal course (lab must also be taken, if available) from the following list:		
BIOB 301	Developmental Biology	
BIOB 375	General Genetics	
BIOB 468	Endocrinology	
BIOE 403	Vert Design & Evolution	
BIOL 435	Comparative Animal Physiology	
BIOO 433 & BIOO 434	Plant Physiology and Plant Physiology Lab	
Total Hours		3-5

Minimum Required Grade: C-

-Ology Course Requirement

Code	Title	Hours
Complete at least one course with a focus on a group of organisms (lab must also be taken, if available) from the following list:		
BIOM 360 & BIOM 361	General Microbiology and General Microbiology Lab (equiv to 260)	3-5

BIOM 427 & BIOM 428	General Parasitology and General Parasitology Lab	
BIOO 320	General Botany	
BIOO 335	Rocky Mountain Flora	
BIOO 340	Biology and Mgmt of Fishes	
BIOO 462	Entomology	
BIOO 470	Ornithology	
BIOO 475	Mammalogy	
Total Hours		3-5

Minimum Required Grade: C-

Specialized Ecology Course Requirement

Code	Title	Hours
Complete one of the following courses:		
BIOE 428	Freshwater Ecology	3-5
BIOE 448	Terrestrial Plant Ecology	
BIOE 449	Plant Biogeography	
BIOM 415	Microbial Dvrsty Eclgy & Evltn	
WILD 346	Wildlife Physiological Ecology	
WILD 470	Conserv of Wildlife Populatns	
Flathead Lake Biological Station courses:		
BIOE 416	Alpine Ecology	
BIOE 439	Stream Ecology	
BIOE 440	Conservation Ecology	
BIOE 451	Landscape Ecology	
BIOE 453	Ecology of Small & Large Lakes	
BIOE 458	Forest and Grassland Ecol	
Total Hours		3-5

Minimum Required Grade: C-

Evolution Course Requirement

Code	Title	Hours
Complete one of the following courses:		
BIOB 480	Conservation Genetics	3
BIOB 483	Phylogenics and Evolution	
BIOB 486	Genomics	
BIOE 406	Behavior & Evolution	
BIOL 484	Plant Evolution	
Total Hours		3

Minimum Required Grade: C-

Required Courses Outside of the Major

Mathematics - Calculus

Note: Students should choose M 171 if they plan to take additional calculus courses if they plan to double major or minor in a field that requires more calculus (e.g. math, physics, biochemistry, computer science).

Code	Title	Hours
Complete one of the following courses:		
M 162	Applied Calculus	4

M 171	Calculus I	
Total Hours		4

Minimum Required Grade: C-

Mathematics - Statistics

Note: Students should choose the full year of statistics for graduate preparation in ecology.

Code	Title	Hours
Complete either one semester or a full year of statistics from the following:		
One Semester:		
STAT 216	Introduction to Statistics	
Full Year:		
STAT 451 & STAT 452	Statistical Methods I and Statistical Methods II	4-8
STAT 457 & STAT 458	Computer Data Analysis I and Computer Data Analysis II	
Total Hours		4-8

Minimum Required Grade: C-

Chemistry

Notes:

- Students who begin in the advanced chemistry sequence may substitute those courses for introductory sequence courses at the discretion of the major advisor.
- Students should choose the advanced sequence for graduate preparation in organismal biology or pre-veterinary medicine.

Code	Title	Hours
Complete a sequence of general and organic chemistry:		
Introductory Chemistry (8 credits):		
CHMY 121N	Introduction to General Chemistry	8-20
CHMY 123 & CHMY 124	Introduction to Organic and Biochemistry and Introduction to Organic and Biochemistry Lab	
Advanced Chemistry (20 credits):		
CHMY 141N & CHMY 142N	College Chemistry I and College Chemistry I Lab	
CHMY 143N & CHMY 144N	College Chemistry II and College Chemistry II Lab	
CHMY 221 & CHMY 222	Organic Chemistry I and Organic Chemistry I Lab	
CHMY 223 & CHMY 224	Organic Chemistry II and Organic Chemistry II Lab	
Total Hours		8-20

Minimum Required Grade: C-

Physics

Code	Title	Hours
Complete one of the following Physics sequences:		
Algebra- and Trigonometry-based Physics:		
PHSX 205N & PHSX 206N	College Physics I and College Physics I Laboratory	10

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

Calculus-based Physics:

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 (require
M 171 and M 172)

Minimum Required Grade: C-

Total Hours 10

Minimum Required Grade: C-

Advanced College Writing Requirement

Rule: To complete the Advanced College Writing Requirement, Biology students take 2 or 3 partial writing courses (either three 1/3 writing courses or one 1/3 writing course and one 2/3 writing course) or one complete writing course. The Ecology & Organismal Biology concentration requires one 2/3 writing course (BIOE 371). 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	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

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	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

Code	Title	Hours
BIOH 462	Principles Medical Physiology	3