BIOLOGY - ECOLOGY AND ORGANISMAL BIOLOGY

Bachelor of Science - Biology; Ecology and Organismal Biology Concentration

College Humanities & Sciences

Degree Specific Credits: 69

Required Cumulative GPA: 2.0

Catalog Year: 2017-2018

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

Biology/Microbiology Lower Division Core	17
Upper Division Core Courses Required by Ecology & Organismal Biology Concentration	5
Additional Upper Division Major 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	
Upper Division Writing Expectation for the Major	3-8
Total Hours	72-93

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	Princpls Biological Diversity	3
BIOB 171N	Princpls 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

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

Minimum Required Grade: C-

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

Rule: Complete a minimum of 21 credits of UD BIOB, BIOE, BIOH, BIOL, BIOM, BIOO, or BCH, with at least one course from each subcategory

Note: Other recommended courses include BCH 380 or BCH 480-BCH 482.

Minimum Required Grade: C-

21 Total Credits Required

Organismal Course Requirement

Rule: Complete at least one organismal course (lab must also be taken, if available) from the following list

Select at least one of the following:		3-5
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

Rule: Complete at least one course with a focus on a group of organisms (lab must also be taken, if available) from the following list

Select at least one of the following:		3-5
BIOM 360 & BIOM 361	General Microbiology and General Microbiology Lab (equiv to 260)	

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

Minimum Required Grade: C-

Specialized Ecology Course Requirement

Select at least one of the following:		3-5
BIOE 428	Freshwater Ecology	
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

Select at least one of the following:		3
BIOB 480	Conservation Genetics	
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

Minimum Required Grade: C-

Mathematics - Calculus

Rule: Complete one of the following calculus courses

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

M 162 or M 171	Applied Calculus Calculus I	4
Total Hours		4

Minimum Required Grade: C-

Mathematics - Statistics

Note: Choose the full year of statistics for graduate preparation in ecology.

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

Minimum Required Grade: C-

Chemistry

Note: Choose the advanced sequence for graduate preparation in organismal biology, or if you are pre-veterinary.

Select either one or two years of chemistry from the following:		8-20
One Year:		
CHMY 121N	Introduction to General Chemistry	
CHMY 123 & CHMY 124	Introduction to Organic and Biochemistry and Introduction to Organic and Biochemistry Lab	
Two Years:		
CHMY 141N	College Chemistry I	
CHMY 142N	College Chemistry I Lab	
CHMY 143N	College Chemistry II	
CHMY 144N	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

Select one of the following physics sequences:		10
Algebra- and Trigonometry-based:		
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:		
PHSX 215N & PHSX 216N	Fund of Physics w/Calc I and Physics Laboratory I w/Calc	
PHSX 217N & PHSX 218N	Fund of Physics w/Calc II and Physics Laboratory II w/Calc (require M 171 and M 172)	
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, 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.

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

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-