

BIOLOGY B.S. - ECOLOGY AND ORGANISMAL BIOLOGY

Bachelor of Science - Biology; Ecology and Organismal Biology Concentration

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	28-42
	Mathematics - Calculus	
	Mathematics - Statistics	
	Chemistry	
	Physics	
	Advanced College Writing Requirement	
	Total Hours	71-85

Degree Specific Credits: 71-85

Required Cumulative GPA: 2.0

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 or environmental consulting agencies. This concentration is also an excellent choice for pre-veterinary 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 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 Core Courses Required by Ecology & Organismal Biology Concentration

Code	Title	Hours
	Complete one of the following courses:	5
BIOE 370 & BIOE 371	General Ecology and General Ecology Lab (equivalent to 271)	
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, BIOC, 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:	3-4
BIOB 301	Developmental Biology	
BIOB 375	General Genetics	
BIOB 435	Comparative Animal Physiology	
BIOB 468	Endocrinology	
BIOE 403	Comparative Vertebrate Anatomy	
BIOC 433 & BIOC 434	Plant Physiology and Plant Physiology Lab	
Total Hours		3-4

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:	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	
BIOC 320	General Botany	
BIOC 335	Rocky Mountain Flora	

BIOO 340	Biology and Management 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
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Complete one of the following courses: 3-5

BIOE 428	Freshwater Ecology
BIOE 447	Ecosystem Ecology
BIOE 448	Terrestrial Plant Ecology
BIOM 415	Microbial Diversity Ecology & Evolution
BIOM 460	Ecology of Infectious Diseases
WILD 470	Conservation of Wildlife Populations

Flathead Lake Biological Station courses (summer only):

BIOE 400	Aquatic Microbial Ecology
BIOE 416	Alpine Ecology
BIOE 439	Stream Ecology
BIOE 440	Conservation Ecology
BIOE 451	Landscape Ecology
BIOE 453	Lake Ecology
BIOE 458	Forest and Fire Ecology

Total Hours 3-5

Minimum Required Grade: C-

Evolution Course Requirement

Code	Title	Hours
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Complete one of the following courses: 3

BIOB 480	Conservation Genetics
BIOB 483	Phylogenics and Evolution
BIOB 486	Genomics
BIOE 406	Behavior & Evolution
BIOE 485	Plant Evolution
BIOM 420	Host-Microbe Interactions

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. astronomy, math, physics, biochemistry, computer science).

Code	Title	Hours
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Complete one of the following courses: 4

M 162	Applied Calculus
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
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Complete either one semester or a full year of statistics from the following: 4-8

One Semester:

STAT 216	Introduction to Statistics
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Full Year:

STAT 451 & STAT 452	Statistical Methods I and Statistical Methods II
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STAT 457 & STAT 458	Computer Data Analysis I and Computer Data Analysis II
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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
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Complete a sequence of general and organic chemistry: 10-20

Introductory Chemistry (10 credits):

CHMY 121N	Introduction to General Chemistry
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CHMY 123 & CHMY 124	Introduction to Organic and Biochemistry and Introduction to Organic and Biochemistry Lab
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Advanced Chemistry (20 credits):

CHMY 141N & CHMY 142N	College Chemistry I and College Chemistry I Lab
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CHMY 143N & CHMY 144N	College Chemistry II and College Chemistry II Lab
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CHMY 221 & CHMY 222	Organic Chemistry I and Organic Chemistry I Lab
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CHMY 223 & CHMY 224	Organic Chemistry II and Organic Chemistry II Lab
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Total Hours 10-20

Minimum Required Grade: C-

Physics

Code	Title	Hours
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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
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PHSX 207N & PHSX 208N	College Physics II and College Physics II Laboratory
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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 (require M 171 and M 172)	
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	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	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	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-