Criterion: C- Number of Credits 10

Course Listing

PHSX 205N	College Physics I	4	F,S,SU
PHSX 206N	College Physics I Laboratory	1	F,S,SU
PHSX 207N	College Physics II	4	F,S,SU
PHSX 208N	College Physics II Laboratory	1	F,S,SU

Commentary: These are algebra- and trigonometry-based physics courses. The calculus-based physics sequence, PHSX 215N/216N & 217N/218N (which require M 171 and M 172), may be substituted for PHSX 205N/206N & 207N/208N.

Commentary:

Upper Division Writing

Category Name: Upper Division Writing Expectation for the Major

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)

Criterion: C- Number of Credits

Course Listing

Commentary: To meet the Upper Division Writing Expectation for the Major, 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 Human Biological Sciences Option does not require a specific writing course.

Subcategory Name: 1/3 UD Writing Courses Rule:

Criterion: C- Number of Credits

BCH 482	Advanced Biochemistry II	3	S
BIOB 410	Immunology	3	F
BIOB 425	Adv Cell & Molecular Biology	3	S
BIOB 483	Phylogenetics and Evolution	3	
BIOE 403	Vert Design & Evolution	5	F
BIOE 409	Behavior & EvolutionDiscussion		1
BIOE 428	Freshwater Ecology	5	F
BIOL 484	Plant Evolution	3	I
BIOM 402	Medical Bacteriology& Mycology	3	S
BIOO 320	General Botany	5	F
BIOO 434	Plant Physiology Lab	1	S
BIOO 470	Ornithology	4	S
BIOO 475	Mammalogy	4	F

Commentary:

Subcategory Name: 2/3 UD Writing Courses Rule:

Criterion: C- Number of Credits

Course Listing

BCH 486	Biochemistry Research Lab	3	S

BCH 499 Senior Thesis/Capstone 3 To 6 F,S,SU
BIOB 411 Immunology Laboratory 2 F
BIOB 499 Undergraduate Thesis 3 To 6 F,S,SU
BIOE 342 Field Ecology 5
BIOE 371 Gen Ecology Lab (equiv to 271) 2 F
BIOM 411 Exprmntl Microbial Genetcs Lab 1
BIOM 499 Undergraduate Thesis 3 To 6 F,S,SU
Commentary:
Subcategory Name: Complete UD Writing Course Rule:
Criterion: Number of Credits
Course Listing
BIOH 462 Principles Medical Physiology 3
Category Name: Exception to the Modern/Classical Languages Requirement Rule: Choose one of the following Math courses
Criterion: C- Number of Credits
Course Listing
M 162 Applied Calculus 4 F,S
M 171 Calculus I 4 F,S
Commentary: 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.
Degree Commentary: The Human Biological Sciences option is a pre-professional program for students planning careers in a health-related field. The following is a partial list of possible professions: physical therapy, medicine, dentistry, physician's assistant, alternative medicine, nutrition, and public health.

College Humanities & Sciences Catalog Year: 2015-2016

Degree Type: Bachelor of Arts Level: Major Subject: **Biology** Option: **Natural History**
Total Credits: 73 Cumulative GPA Required: 2.0
Lower Division Core
Category Name: Biology/Microbiology Lower Division Core Rule: All of the following courses are required.
Criterion: C-
Course Listing Number of Credits 17
BIOB 160N Principles of Living Systems 4 F,SU
BIOB 170N Princpls Biological Diversity 3 S,SU
BIOB 171N Princpls Biological Dvrsty Lab 2 S,SU
BIOB 260 Cellular and Molecular Biology 4 F,SU
BIOB 272 Genetics and Evolution 4 S,SU
Commentary: The lower division core should be completed before attempting most upper division major courses. AP Biology credit may be substituted for either BIOB 160N or BIOB 170N/171N.
Commentary:

Upper Division Core

Category Name: Upper Division Core Courses Required by Natural History Option Rule: All of the following courses are required.

Criterion: C-

Course Listing Number of Credits 20

BIOE 370	General Ecology	3	F
BIOE 371	Gen Ecology Lab (equiv to 271)	2	F
BIOE 406	Behavior & Evolution	3	
BIOO 320	General Botany	5	F
BIOO 335	Rocky Mountain Flora	3	S,SU
BIOO 462	Entomology	4	SE

Commentary: BIOE 342 Field Ecology at the Flathead Lake Biological Station may be substituted for BIOE 370/371

Commentary: Major Electives

Category Name: Additional Upper Division Major Courses Required for Natural History Option Rule: Complete one of the following courses

Criterion: C- Number of Credits 4

Course Listing

BIOO 470	Ornithology	4	S
BIOO 475	Mammalogy	4	F

Commentary: Cognates

Category Name: Required Courses Outside of the Major Rule:

Criterion: C- Number of Credits

Course Listing Commentary:

Subcategory Name: Chemistry and Geology Rule: Complete all of the following courses

Criterion: C- Number of Credits 12

Course Listing

CHMY 121N	Intro to General Chemistry	3	F,S,SU
CHMY 124N	Intro to Organic & Biochem Lab	2	F,S,SU
GEO 101N	Intro to Physical Geology	3	F,S,SU
GEO 102N	Intro to Physical Geology Lab	1	F,S,SU

Subcategory Name: Cognate Electives

Rule: Complete 20 credits from the following disciplines (maximum of 10 credits/discipline): ANTY, ASTR, CHMY (excluding 121N, 123N, 124N), GPHY, GEO (excluding 101N, 102N), FORS, M, PHSX, STAT, or WILD

Criterion: Number of Credits 20

Course Listing

Commentary: Students should plan on taking M 121 or higher level M course (prerequisite for BIOB 272 and GER math requirement) and STAT 216 (prerequisite for BIOE 371).

Students interested in combining the Natural History Option with another subject area may, with the advisor's permission, substitute 20 credits in English - writing, journalism, photography, art, foreign language, business management, or other appropriate field.

Upper Division Writing

Category Name: Upper Division Writing Expectation for the Major

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).

Criterion: C- Number of Credits

Course Listing

Commentary: To meet the Upper Division Writing Expectation for the Major, 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 Natural History Option requires one 2/3 writing course (BIOE 371) and several 1/3 writing courses (BIOO 320, BIOO 470 or BIOO 475). No additional writing courses must be taken to meet this requirement.

Degree Specific Symbolic Systems

Category Name: Exception to the Modern/Classical Languages Requirement Rule: Choose one of the following Math courses

Criterion: C- Number of Credits

Course Listing

M 162 Applied Calculus 4 F,S

M 171 Calculus I 4 F,S

Commentary: The Division of Biological Sciences has been granted an exception to the Modern/Classical Language Requirement. Either of these Calculus courses will satisfy this requirement. The Natural History Option does not require a calculus course; the Natural History student may choose to take one year of a modern or classical language, or they may take one of these calculus courses (which will count towards a cognate elective).

Degree Commentary: The natural history option is designed for students who seek an interdisciplinary science program. This option is not research-oriented, and is not considered a preparatory program for traditional research-based graduate programs. It is, however, designed for students seeking careers in environmental education, science writing or illustration, natural history or wildlife film-making, or natural history centers or museums. There is enough latitude in the requirements to allow for a minor or even a double major in a related field of interest (e.g. journalism, art, media arts, etc.).

College Humanities & Sciences Catalog Year: 2015-2016

Degree Type: Bachelor of Science Level: **Major** Subject: **Microbiology**

Total Credits: 91 Cumulative GPA Required: 2.0

Lower Division Core

Category Name: Biology/Microbiology Lower Division Core Rule: All of the following courses are required.

Criterion: C-

Course Listing Number of Credits 17

BIOB 160N	Principles of Living Systems	4	F,SU
BIOB 170N	Princpls Biological Diversity	3	S,SU
BIOB 171N	Princpls Biological Dvrsty Lab	2	S,SU
BIOB 260	Cellular and Molecular Biology	4	F,SU
BIOB 272	Genetics and Evolution	4	S,SU

Commentary: The lower division core should be completed before attempting most upper division major courses. AP Biology credit may be substituted for either BIOB 160N or BIOB 170N/171N.

Commentary: Upper Division Core

Category Name: Upper Division Microbiology Core Courses

Rule: All of the following courses are required.

Criterion: C-

Course Listing Number of Credits 19

BIOE 370	General Ecology	3	F
BIOM 360	Gen Microbiolgy (equiv to 260)	3	F,S
BIOM 361	Gen Microbiolgy Lb (equiv 261)	2	F,S
BIOM 410	Microbial Genetics	3	S
BIOM 411	Exprmntl Microbial Genetcs Lab	1	S
BIOM 415	Microbial Dvrsty Eclgy & Evltn	3	S
BIOM 450	Microbial Physiology	3	F
BIOM 451	Microbial Physiology Lab	1	F

Commentary: Major Electives

Category Name: Additional UD Major Courses Required for Microbiology Rule:

Criterion: C- Number of Credits

Course Listing Commentary:

Subcategory Name: Biochemistry

Rule: Complete either one semester of biochemistry (BCH 380) or one year of biochemistry (BCH 480-482)

Criterion: C- Number of Credits 4 or 6

Course Listing

BCH 380	Biochemistry	4	F,S
BCH 480	Advanced Biochemistry I	3	F
BCH 482	Advanced Biochemistry II	3	S

Commentary:

Subcategory Name: Additional UD Depth Courses in Microbiology

Rule: Complete 7 - 9 credits from the following list (labs must be taken with lectures, if available). 7 credits if BCH 480-482 taken; 9 credits if BCH 380 taken.

Criterion: C-

Course Listing Number of Credits 7 or 9

BIOB 410	Immunology	3	F

BIOB 411	Immunology Laboratory	2	F	
BIOB 483	Phylogenetics and Evolution	3		
BIOH 405	Hematology	3	F	
BIOM 402	Medical Bacteriology& Mycology	3	S	
BIOM 403	Medicl Bacteriolgy & Myclgy Lb	2	S	
BIOM 407	Clinical Diagnosis	2	S	
BIOM 408	Clinical Diagnosis Lab	1	S	
BIOM 427	General Parasitology	2	F	
BIOM 428	General Parasitology Lab	2	F	
BIOM 435	Virology	3	S	
BIOM 490	Adv Undergrad Research	1 To 10	F,S,SU	

Commentary: If BIOB 410 Immunology, then BIOB 411 Immunology Lab must also be taken.

If BIOM 402 Medical Bacteriology & Mycology, then BIOM 403 Medical Bacteriology & Mycology Lab must also be taken. If BIOM 407 Clinical Diagnosis, then BIOM 408 Clinical Diagnosis Lab must also be taken.

Commentary:

Cognates

Category Name: Required Courses Outside of the Major Rule:

Criterion: C- Number of Credits

Course Listing Commentary:

Subcategory Name: Mathematics

Rule: All of the following courses are required.

Criterion: C- Number of Credits 8

Course Listing

M 162	Applied Calculus	4	F,S	
STAT 216	Introduction to Statistics	4	F,S,SU	

Commentary: M 171 Calculus I may be substituted for M 162.

Subcategory Name: Chemistry

Rule: All of the following courses are required.

Criterion: C- Number of Credits 24

Course Listing

CHMY 141N	College Chemistry I	5	F,S	
CHMY 143N	College Chemistry II	5	S,SU	
CHMY 221	Organic Chem I	3	F	
CHMY 222	Org Chm I Lab	2	F	
CHMY 223	Organic Chm II	3	S	
CHMY 224	Org Chm II Lab	2	S	
CHMY 311	Analytical Chem-Quant Analysis	4	F,SU	

Commentary:

Subcategory Name: Physics

Rule: All of the following courses are required.

Criterion: C- Number of Credits 10

Course Listing

PHSX 205N	College Physics I	4	F,S,SU
PHSX 206N	College Physics I Laboratory	1	F,S,SU
PHSX 207N	College Physics II	4	F,S,SU
PHSX 208N	College Physics II Laboratory	1	F,S,SU

(which require M 171 and M 172), may be substituted for PHSX 205N/206N & 207N/208N.

Commentary:

Upper Division Writing

Category Name: Upper Division Writing Expectation for the Major

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)

Criterion: C- Number of Credits

Course Listing

Commentary: To meet the Upper Division Writing Expectation for the Major, Microbiology students take at least 2 partial writing courses. The Microbiology degree requires one 2/3 writing course (BIOM 411). The UD Writing Expectation for the Major is completed with one more course, chosen from any of the following.

Subcategory Name: 1/3 UD Writing Courses Rule:

Criterion: C- Number of Credits

Course Listing

BCH 482	Advanced Biochemistry II	3	S
BIOB 410	Immunology	3	F
BIOB 425	Adv Cell & Molecular Biology	3	S
BIOB 483	Phylogenetics and Evolution	3	
BIOE 403	Vert Design & Evolution	5	F
BIOE 409	Behavior & EvolutionDiscussion	1	
BIOE 428	Freshwater Ecology	5	F
BIOL 484	Plant Evolution	3	I
BIOM 402	Medical Bacteriology& Mycology	3	S
BIOO 320	General Botany	5	F
BIOO 434	Plant Physiology Lab	1	S
BIOO 470	Ornithology	4	S
BIOO 475	Mammalogy	4	F

Commentary:

Subcategory Name: 2/3 UD Writing Courses Rule:

Criterion: C- Number of Credits

Course Listing

BCH 486	Biochemistry Research Lab	3	S

BCH 499 Senior Thesis/Capstone 3 To 6 F,S,SU
BIOB 411 Immunology Laboratory 2 F
BIOB 499 Undergraduate Thesis 3 To 6 F,S,SU
BIOE 342 Field Ecology 5
BIOE 371 Gen Ecology Lab (equiv to 271) 2 F
BIOM 411 Exprmntl Microbial Genetcs Lab 1
BIOM 499 Undergraduate Thesis 3 To 6 F,S,SU
Subcategory Name: Complete UD Writing Course Rule:
Criterion: Number of Credits
Course Listing
BIOH 462 Principles Medical Physiology 3
Commentary:
Degree Specific Symbolic Systems
Category Name: Exception to the Modern/Classical Languages Requirement Rule: Choose one of the following Math courses
Criterion: C- Number of Credits
Course Listing
M 162 Applied Calculus 4 F,S
M 171 Calculus I 4 F,S
Commentary: 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.
Degree Commentary: Microbiology is the study of microorganisms including bacteria, fungi, viruses, and protozoa. This general microbiology option 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 option for pre-medical sciences students.

College Humanities & Sciences Catalog Year: 2015-2016

Degree Type: Bachelor of Science Level: **Major** Subject: **Microbiology** Option: **Microbial Ecology**
Total Credits: 76 Cumulative GPA Required: 2.0
Lower Division Core
Category Name: Biology/Microbiology Lower Division Core Rule: All of the following courses are required.
Criterion: C-
Course Listing Number of Credits 17
BIOB 160N Principles of Living Systems 4 F,SU
BIOB 170N Princpls Biological Diversity 3 S,SU
BIOB 171N Princpls Biological Dvrsty Lab 2 S,SU
BIOB 260 Cellular and Molecular Biology 4 F,SU
BIOB 272 Genetics and Evolution 4 S,SU

Commentary: The lower division core should be completed before attempting most upper division major courses. AP Biology credit may be substituted for either BIOB 160N or BIOB 170N/171N.

Commentary: Upper Division Core

Category Name: Upper Division Microbiology Core Courses

Rule: All of the following courses are required.

Criterion: C- Number of Credits 19

Course Listing

BIOE 370	General Ecology	3	F
BIOM 360	Gen Microbiolgy (equiv to 260)	3	F,S
BIOM 361	Gen Microbiolgy Lb (equiv 261)	2	F,S
BIOM 410	Microbial Genetics	3	S
BIOM 411	Exprmntl Microbial Genetcs Lab	1	S
BIOM 415	Microbial Dvrsty Eclgy & Evltn	3	S
BIOM 450	Microbial Physiology	3	F
BIOM 451	Microbial Physiology Lab	1	F

Commentary:

Commentary: Major Electives

Category Name: Additional UD Major Courses Required for Microbial Ecology Option Rule:

Criterion: C- Number of Credits

Course Listing Commentary:

Subcategory Name: Biochemistry

Rule: Complete either one semester of biochemistry (BCH 380) or one year of biochemistry (BCH 480-482)

Criterion: C- Number of Credits 4 or 6

Course Listing

BCH 380	Biochemistry	4	F,S
BCH 480	Advanced Biochemistry I	3	F
BCH 482	Advanced Biochemistry II	3	S

Commentary: If one year of chemistry is completed, then BCH 380 must be taken. Either BCH 380 or BCH 480-482 may be taken if two years of chemistry are completed.

Subcategory Name: Additional UD Depth Courses in Microbiology

Rule: Complete 7 - 9 credits from the following list (labs must be taken with lectures, if available). 7 credits if BCH 480-482 taken; 9 credits if BCH 380 taken.

Criterion: C-

Course Listing Number of Credits 7 or 9

BIOB 410	Immunology	3	F
BIOB 411	Immunology Laboratory	2	F
BIOB 440	Biological Electron Microscopy	2	S
BIOE 371	Gen Ecology Lab (equiv to 271)	2	F
BIOE 428	Freshwater Ecology	5	F

BIOE 439	Stream Ecology	3	SU
BIOE 453	Ecology of Small & Large Lakes	3	SU
BIOM 427	General Parasitology	2	F
BIOM 428	General Parasitology Lab	2	F
BIOM 435	Virology	3	S
BIOM 490	Adv Undergrad Research	1 To 10	F,S,SU
BIOO 433	Plant Physiology	3	S
BIOO 434	Plant Physiology Lab	1	S

Commentary: If BIOB 410 Immunology, then BIOB 411 Immunology Lab must also be taken.

If BIOM 427 General Parasitology, then BIOM 428 General Parasitology Lab must also be taken. If BIOO 433 Plant Physiology, then BIOO 434 Plant Physiology Lab must also be taken.

Commentary: Cognates

Category Name: Required Courses Outside of the Major Rule:

Criterion: C- Number of Credits

Course Listing Commentary:

Subcategory Name: Mathematics - Calculus

Rule: Complete one of the following calculus courses

Criterion: C- Number of Credits 4

Course Listing

M 162	Applied Calculus	4	F,S
M 171			
Commentary:	Calculus I	4	F,S

Subcategory Name: Mathematics - Statistics Rule: The following course is required

Criterion: C- Number of Credits 4

Course Listing

STAT 216	Introduction to Statistics	4	F,S,SU Commentary:

Subcategory Name: Chemistry

Rule: Complete either one year of chemistry (CHMY 121N, 123N/124N) or two years of chemistry (CHMY 141N, 143N, 221/222, 223/224) Criterion: C- Number of Credits 8 or 20

Course Listing

CHMY 121N	Intro to General Chemistry	3	F,S,SU
CHMY 123N	Intro to Organic & Biochem	3	F,S,SU
CHMY 124N	Intro to Organic & Biochem Lab	2	F,S,SU
CHMY 141N	College Chemistry I	5	F,S
CHMY 143N	College Chemistry II	5	S,SU
CHMY 221	Organic Chem I	3	F
CHMY 222	Org Chm I Lab	2	F
CHMY 223	Organic Chm II	3	S
CHMY 224	Org Chm II Lab	2	S

Commentary:

Subcategory Name: Physics

Rule: The following courses are required.

Criterion: C- Number of Credits 5

Course Listing

PHSX 205N	College Physics I	4	F,S,SU
PHSX 206N	College Physics I Laboratory	1	F,S,SU

Commentary: PHSX 205N/206N & 207N/208N are algebra- and trigonometry-based physics courses. The calculus-based physics sequence, PHSX 215N/216N & 217N/218N (which require M 171 and M 172), may be substituted for PHSX 205N/206N and 207N/208N.

Subcategory Name: Additional Science Requirement

Rule: Complete at least 6 credits from the following list of courses

Criterion: C-

Course Listing Number of Credits 6

CHMY 311	Analytical Chem-Quant Analysis	4	F,SU
CSCI 135	Fund of Computer Science I	3	F,S
ENSC 245N	Soils	3	F,S
GEO 420	Hydrogeology	4	F
GEO 482	Global Change	3	S
M 172	Calculus II	4	F,S
M 273	Multivariable Calculus	4	F,S
PHSX 207N	College Physics II	4	F,S,SU
PHSX 208N	College Physics II Laboratory	1	F,S,SU
STAT 451	Statistical Methods I	3	F
STAT 452	Statistical Methods II	3	S
STAT 457	Computer Data Analysis I	1	F
STAT 458	Computer Data Analysis II	1	S

Commentary:

Category Name: Upper Division Writing Expectation for the Major

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).

Criterion: C- Number of Credits

Course Listing

Commentary: To meet the Upper Division Writing Expectation for the Major, Microbiology students take at least 2 partial writing courses. The Microbiology degree requires one 2/3 writing course (BIOM 411). The UD Writing Expectation for the Major is completed with one more course, chosen from any of the following.

Subcategory Name: 1/3 UD Writing Courses Rule:

Criterion: C- Number of Credits

Course Listing

BCH 482 Advanced Biochemistry II 3 S
BIOB 410 Immunology 3 F
BIOB 425 Adv Cell & Molecular Biology 3 S
BIOB 483 Phylogenetics and Evolution 3
BIOE 403 Vert Design & Evolution 5 F
BIOE 409 Behavior & EvolutionDiscussion 1
BIOE 428 Freshwater Ecology 5 F
BIOL 484 Plant Evolution 3 I
BIOM 402 Medical Bacteriology& Mycology 3 S
BIOO 320 General Botany 5 F
BIOO 434 Plant Physiology Lab 1 S
BIOO 470 Ornithology 4 S
BIOO 475 Mammalogy 4 F
Commentary:
Subcategory Name: 2/3 UD Writing Courses Rule:
Criterion: C- Number of Credits
Course Listing
BCH 486 Biochemistry Research Lab 3 S
BCH 499 Senior Thesis/Capstone 3 To 6 F,S,SU
BIOB 411 Immunology Laboratory 2 F
BIOB 499 Undergraduate Thesis 3 To 6 F,S,SU
BIOE 342 Field Ecology 5
BIOE 371 Gen Ecology Lab (equiv to 271) 2 F
BIOM 411 Exprmntl Microbial Genetcs Lab 1
BIOM 499 Undergraduate Thesis 3 To 6 F,S,SU
Subcategory Name: Complete UD Writing Course Rule:
Criterion: Number of Credits
Course Listing
BIOH 462 Principles Medical Physiology 3
Commentary:
Degree Specific Symbolic Systems
Category Name: Exception to the Modern/Classical Languages Requirement Rule: Choose one of the following Math courses
Criterion: C- Number of Credits
Course Listing
M 162 Applied Calculus 4 F,S
M 171 Calculus I 4 F,S
Commentary: 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.

Commentary: Degree Commentary

Microbiology is the study of microorganisms including bacteria, fungi, viruses, and protozoa. The option in Microbial Ecology emphasizes microbial structure and function as well as interactions and relationships with the environment and other organisms. Students may continue their studies at the graduate level and seek research careers in government, or private laboratories.

College Humanities & Sciences Catalog Year: 2015-2016

Degree Type: Bachelor of Science Level: Major Subject: **Medical Technology 4+1**

Total Credits: 86 Cumulative GPA Required: 2.0

Lower Division Core

Category Name: Lower Division Biology Courses

Criterion: C- Number of Credits 8

Course Listing

BIOB 260	Cellular and Molecular Biology	4	F,SU
BIOB 272	Genetics and Evolution	4	S,SU

Commentary: Either BIOB 160N (C- or better) or BCH 110/111 (C- or better) or BIOH 112 (B- or better) must be taken as a prerequisite for BIOB 260, unless a student has AP Biology credit.

Commentary: Upper Division Core

Category Name: Required Major Courses for Medical Technology 4 + 1 Rule: All of the following courses are required

Criterion: C-

Course Listing Number of Credits 36

BCH 380	Biochemistry	4	F,S
BIOB 410	Immunology	3	F
BIOB 411	Immunology Laboratory	2	F
BIOH 365	Human AP I for Health Profsns	4	F,SU
BIOH 405	Hematology	3	F
BIOM 360	Gen Microbiolgy (equiv to 260)	3	F,S
BIOM 361	Gen Microbiolgy Lb (equiv 261)	2	F,S
BIOM 402	Medical Bacteriology& Mycology	3	S
BIOM 403	Medicl Bacteriolgy & Myclgy Lb	2	S
BIOM 407	Clinical Diagnosis	2	S
BIOM 408	Clinical Diagnosis Lab	1	S
BIOM 427	General Parasitology	2	F
BIOM 428	General Parasitology Lab	2	F
BIOM 435	Virology	3	S

Commentary: BCH 480-482 may be substituted for BCH 380.

Commentary: Cognates

Category Name: Required Courses Outside the Major Rule:

Criterion: Number of Credits

Course Listing Commentary:

Rule: Complete one of the following calculus courses

Criterion: C- Number of Credits 4

Course Listing

M 162	Applied Calculus	4	F,S
M 171	Calculus I	4	F,S

Subcategory Name: Mathematics - Statistics Rule: The following course is required

Criterion: C- Number of Credits 4

Course Listing

STAT 216	Introduction to Statistics	4	F,S,SU

Commentary:

Subcategory Name: Chemistry

Rule: All of the following courses are required

Criterion: C- Number of Credits 24

Course Listing

CHMY 141N	College Chemistry I	5	F,S
CHMY 143N	College Chemistry II	5	S,SU
CHMY 221	Organic Chem I	3	F
CHMY 222	Org Chm I Lab	2	F
CHMY 223	Organic Chm II	3	S
CHMY 224	Org Chm II Lab	2	S
CHMY 311	Analytical Chem-Quant Analysis	4	F,SU

Commentary:

Subcategory Name: Physics

Rule: All of the following courses are required

Criterion: C- Number of Credits 10

Course Listing

PHSX 205N	College Physics I	4	F,S,SU
PHSX 206N	College Physics I Laboratory	1	F,S,SU
PHSX 207N	College Physics II	4	F,S,SU
PHSX 208N	College Physics II Laboratory	1	F,S,SU

Commentary: These are algebra- and trigonometry-based physics courses. The calculus-based sequence, PHSX 215N/216N & 217N/218N (which require M 171 and M 172), may be substituted for PHSX 205N/206N & 207N/208N.

Commentary:

Category Name: Upper Division Writing Expectation for the Major

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).

Criterion: C- Number of Credits
Course Listing
Commentary: To meet the Upper Division Writing Expectation for the Major, Medical Technology 4+1 students take BIOB 410 (a 1/3 writing course) and BIOB 411 (a 2/3 writing course).
Commentary:
Degree Specific Symbolic Systems
Category Name: Exception to the Modern/Classical Languages Requirement Rule: Choose one of the following Math courses
Criterion: C- Number of Credits 4
Course Listing
M 162 Applied Calculus 4 F,S
M 171 Calculus I 4 F,S
Commentary: The Division of Biological Sciences has been granted an exception to the Modern/Classical Languages Requirement. Either of these calculus courses (required by the major) will satisfy this requirement.
Commentary: Degree Commentary
A Medical Technology degree prepares students to perform various chemical, histological, and microbial laboratory procedures used in the diagnosis, study, and treatment of disease. Students with this degree seek employment in hospital laboratories, physicians' offices, and health departments. For clinical practice, a student must be certified through the Board of Registry by completing a one year clinical practicum. The 4+1 track is the more flexible option, in which students complete the four years of the Bachelor's degree on the UM campus. Students may apply to a clinical practicum program anywhere in the country.

Or

Level: Major Subject: **Medical Technology 3 + 1**
Total Credits: 101 Cumulative GPA Required: 2.0
Lower Division Core
Category Name: Lower Division Biology Courses Rule: All of the following courses are required.
Criterion: C- Number of Credits 8
Course Listing
BIOB 260 Cellular and Molecular Biology 4 F,SU
BIOB 272 Genetics and Evolution 4 S,SU
Commentary: Either BIOB 160N (C- or better) or BCH 110/111 (C- or better) or BIOH 112 (B- or better) must be taken as a prerequisite for BIOB 260, unless a student has AP Biology credit.
Commentary: Upper Division Core
Category Name: Required Major Courses for Medical Technology 3 + 1 Rule: All of the following courses are required
Criterion: C-
Course Listing Number of Credits 31

BCH 380 Biochemistry 4 F,S
BIOB 410 Immunology 3 F
BIOH 365 Human AP I for Health Profsns 4 F,SU
BIOH 405 Hematology 3 F
BIOM 360 Gen Microbiolgy (equiv to 260) 3 F,S
BIOM 361 Gen Microbiolgy Lb (equiv 261) 2 F,S
BIOM 402 Medical Bacteriology& Mycology 3 S
BIOM 403 Medicl Bacteriolgy & Myclgy Lb 2 S
BIOM 428 General Parasitology Lab 2 F
BIOM 435 Virology 3 S
Commentary:
Subcategory Name: Required Professional Practicum Rule: All of the following courses are required
Criterion: C- Number of Credits 37
Course Listing
BIOH 470 Summer Clinical Laboratory 12 SU
BIOH 471 Professional Training I 13 F
BIOH 472 Professional Training II 12 S
Commentary: You must apply for the professional practicum during the autumn prior to enrollment. To be competitive for this practicum, you must be in good academic standing with a minimum GPA of ~3.0, and demonstrate a commitment to the clinical laboratory profession. For more information, visit: http://www.umt.edu/medtech/default.html. Contact Dr. Mike Minnick to apply for the practicum.
Commentary: Cognates
Category Name: Required Courses Outside the Major Rule:
Criterion: Number of Credits
Course Listing Commentary:
Subcategory Name: Mathematics - Calculus
Rule: Complete one of the following calculus courses
Criterion: C- Number of Credits 4
Course Listing
M 162 Applied Calculus 4 F,S
M 171 Calculus I 4 F,S
Subcategory Name: Mathematics - Statistics Rule: The following course is required
Criterion: C- Number of Credits 4
Course Listing
STAT 216 Introduction to Statistics 4 F,S,SU Commentary:
Subcategory Name: Chemistry
Criterion: C- Number of Credits 15
Course Listing
CHMY 141N College Chemistry I 5 F,S

CHMY 143N	College Chemistry II	5	S,SU
CHMY 221	Organic Chem I	3	F
CHMY 222	Org Chm I Lab	2	F

Commentary:

Upper Division Writing

Category Name: Upper Division Writing Expectation for the Major

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.

Criterion: C- Number of Credits

Course Listing

Commentary: To meet the Upper Division Writing Expectation for the Major, Medical Technology 3+1 students take two 1/3 writing courses (BIOB 410 and BIOM 402). The Upper Division Writing Expectation for the Major is completed with one more course, chosen from any of the following. (BIOB 411 Immunology Lab is recommended by many of the clinical practicum affiliates).

Subcategory Name: 1/3 UD Writing Courses Rule:

Criterion: Number of Credits

Course Listing

BCH 482	Advanced Biochemistry II	3	S
BIOB 410	Immunology	3	F
BIOB 425	Adv Cell & Molecular Biology	3	S
BIOB 483	Phylogenetics and Evolution	3	
BIOE 403	Vert Design & Evolution	5	F
BIOE 409	Behavior & EvolutionDiscussion		1
BIOE 428	Freshwater Ecology	5	F
BIOL 484	Plant Evolution	3	I
BIOM 402	Medical Bacteriology& Mycology	3	S
BIOO 320	General Botany	5	F
BIOO 434	Plant Physiology Lab	1	S
BIOO 470	Ornithology	4	S
BIOO 475	Mammalogy	4	F

Commentary:

Rule: Criterion:

Course Listing

Number of Credits

BCH 486	Biochemistry Research Lab	3	S
BCH 499	Senior Thesis/Capstone	3 To 6	F,S,SU
BIOB 411	Immunology Laboratory	2	F
BIOB 499	Undergraduate Thesis	3 To 6	F,S,SU
BIOE 342	Field Ecology	5	

BIOE 371 Gen Ecology Lab (equiv to 271) 2 F
BIOM 411 Exprmntl Microbial Genetcs Lab 1
BIOM 499 Undergraduate Thesis 3 To 6 F,S,SU
Commentary:
Subcategory Name: Complete UD Writing Course Rule:
Criterion: Number of Credits
Course Listing
BIOH 462 Principles Medical Physiology 3
Commentary:
Degree Specific Symbolic Systems
Category Name: Exception to the Modern/Classical Languages Requirement Rule: Choose one of the following Math courses
Criterion: C- Number of Credits 4
Course Listing
M 162 Applied Calculus 4 F,S
M 171 Calculus I 4 F,S
Commentary: The Division of Biological Sciences has been granted an exception to the Modern/Classical Languages Requirement. Either of these calculus courses (required by the major) will satisfy this requirement.
Commentary: Degree Commentary
A Medical Technology degree prepares students to perform various chemical, histological, and microbial laboratory procedures used in the diagnosis, study, and treatment of disease. Students with this degree seek employment in hospital laboratories, physicians' offices, and health departments. For clinical practice, a student must be certified through the Board of Registry by completing a one year clinical practicum. The 3+1 track is the faster option, as the clinical practicum year is part of the degree. Three years are spent on the UM campus, and then the clinical practicum year with the MUS CLS program (or with one of our affiliated programs) is the fourth year of the Bachelor's degree. Note: this degree requires a total of 130 credits.

College Humanities & Sciences Catalog Year: 2015-2016

Degree Type: Minor Level: **Minor** Subject: **Biology**
Total Credits: 25 Cumulative GPA Required: 2.0
Lower Division Core
Category Name: Biology/Microbiology Lower Division Core Rule: All of the following courses are required.
Criterion: C-
Course Listing Number of Credits 17
BIOB 160N Principles of Living Systems 4 F,SU
BIOB 170N Princpls Biological Diversity 3 S,SU
BIOB 171N Princpls Biological Dvrsty Lab 2 S,SU
BIOB 260 Cellular and Molecular Biology 4 F,SU
BIOB 272 Genetics and Evolution 4 S,SU

Commentary: The lower division core should be completed before attempting most upper division BIO_ courses. AP Biology may be substituted for either BIOB 160N or BIOB 170N/171N.
Commentary:
Upper Division Electives
Category Name: Upper Division Biology Requirement for the Minor
Rule: Complete 8 credits of Upper Division in Biology (BIOB, BIOE, BIOH, BIOL, or BIOO)
Criterion: C- Number of Credits 8
Course Listing
Commentary: These eight credits may not include BIOC, BCH, or BIOM courses.

College Humanities & Sciences Catalog Year: 2015-2016

Degree Type: Minor Level: **Minor** Subject: **Microbiology**
Total Credits: 19 Cumulative GPA Required: 2.0
Upper Division Core
Category Name: Microbiology Core Courses Rule: All of the following courses are required.
Criterion: C- Number of Credits 16
Course Listing

BIOM 360	Gen Microbiolgy (equiv to 260)	3	F,S
BIOM 361	Gen Microbiolgy Lb (equiv 261)	2	F,S
BIOM 410	Microbial Genetics	3	S
BIOM 411	Exprmntl Microbial Genetcs Lab	1	S
BIOM 415	Microbial Dvrsty Eclgy & Evltn	3	S
BIOM 450	Microbial Physiology	3	F
BIOM 451	Microbial Physiology Lab	1	F

Commentary:
Upper Division Electives
Category Name: Additional Upper Division Microbiology Requirement Rule: Complete 3 additional upper division credits in BIOM
Criterion: C- Number of Credits 3
Course Listing Commentary:

Department Faculty

Professor

- Creagh Breuner, Professor
- Ragan Callaway, Professor
- Chris Comer, Dean / Professor
- James Elser, Professor, Director of the Flathead Lake Biological Station
- Douglas Emlen, Professor

- Willard Granath Jr., Professor
- Erick Greene, Professor
- F. Richard Hauer, UM Director-Institute on Ecosystems
- Jesse Hay, Professor, DBS
- William Holben, Professor
- Charles Janson, Associate Dean / Professor
- J. Stephen Lodmell, Professor
- Gordon Luikart, Professor of Conservation Ecology and Genetics
- John Maron, Professor
- Michael Minnick, Professor
- Jack Nunberg, Professor and Director of MBC
- Frank Rosenzweig, Professor
- Anna Sala, Professor
- D. Scott Samuels, Professor
- Stephen Sprang, Professor, DBS & Director, CBSD
- Jack Stanford, Bierman Professor & Director of Flathead Lake Biological Station
- H. Maurice Valett, Professor of Systems Ecology

Associate Professor

- Lila Fishman, Associate Professor
- Mark Grimes, Associate Professor, DBS
- Winsor Lowe, Associate Professor
- Scott Miller, Associate Professor
- Bret Tobalske, Associate Professor, Director Field Research Station
- Scott Wetzel, Associate Professor
- Art Woods, Associate Professor

Assistant Professor

- Sarah Certel, Assistant Professor, DBS
- Zachary Cheviron, Assistant Professor
- Jeffrey Good, Assistant Professor
- John McCutcheon, Assistant Professor
- Brent Ryckman, Assistant Professor
- Ekaterina Voronina, Assistant Professor

Lecturer

- Heather Labbe, Lecturer
- Laurie A. Minns, Lecturer, Division of Biological Sciences
- Kevin Murray, Lecturer

Research Faculty

- Jim Battisti
- Dan Drecktrah, Assistant Research Professor
- Bonnie Ellis, Assistant Research Professor

- Jay Evans, Research Professor, Director of CTM
- Matthew Herron, Research Assistant Professor
- John S. Kimball, Research Professor
- Evgueny Kroll, Research Assistant Professor
- Penelope Kukuk, Retired Research Professor
- Jean-Marc Lanchy, Research Assistant Professor
- Erin Landguth, Assistant Research Professor
- Mark Lorang, Associate Research Professor
- Tung-Chung Mou, Assistant Research Professor
- Daniel Mummey
- Dean Pearson, Research Ecologist - USFS
- Alyson Smith, Assistant Research Professor
- Barbara Wright, Retired Research Professor

Affiliates

- Ashley Ballantyne, Assistant Professor of Bioclimatology
- Len Broberg, Professor
- Barry Brown
- James Burchfield, Professor of Forest Social Sciences
- Cory Cleveland, Associate Professor of Terrestrial Ecosystem Ecology
- Robert Crabtree, Research Associate Professor
- Solomon Dobrowski, Associate Professor of Forest Landscape Ecology
- Lisa Eby, Associate Professor of Aquatic Vertebrate Ecology; Undergraduate Program Director, Ecological Science & Restoration
- Kelsey Jencso, Assistant Professor, Watershed Hydrologist
- Ulrich Kamp, Professor
- Anna Klene, Associate Professor
- Henriette Lowisch, Associate Professor
- Thomas E Martin, DBS Associated Faculty
- Alexander L. Metcalf, Research Assistant Professor
- Elizabeth Covelli Metcalf, Assistant Professor of Recreation Management & Human Dimensions of Natural Resources; Undergraduate Program Director, PTRM
- Jakki Mohr, Professor
- Clint Muhlfeld, Research Assistant Professor
- Helen Naughton, Associate Professor
- Cara Nelson, Associate Professor of Restoration Ecology
- Alison Perkins, Adjunct Professor
- Douglas Raiford, Computer Science Department Chair, Bioinformatics, Modeling, Machine Learning, Pattern Recognition, Data Science
- Jeff Renz, Clinical Professor
- Steve Running, Regents Professor of Ecology; Director, Numerical Terradynamics Simulation Group
- Diana Six, Professor of Forest Entomology/Pathology; Chair, Department of Ecosystems & Conservation Sciences
- Linda Vance, Senior Ecologist/Spatial Analysis Lab Director
- Vicki Watson, Professor

Emeritus

- Fred Allendorf, Regents Professor Emeritus
- Kenneth Dial, Professor Emeritus
- Kerry Foresman, Professor Emeritus
- James Gannon, Professor Emeritus
- Walter Hill, Professor Emeritus
- Richard Hutto, Professor Emeritus

Course Descriptions

Biology-General

BIOB 101N - Discover Biology
Credits: 3. Offered every term. Contemporary exploration of the organization and complexity of living organisms and the systems in which they live. The central question of biology--relationship between form and function, acquisition and use of energy, and continuity between generations will be addressed through lectures and laboratory investigations. Credit not allowed toward a major in biology. Credit not allowed for both BIOB 101N and BIOB 160N. Course Attributes: Natural Science Lab Course
BIOB 130N - Evolution and Society
Credits: 3. Offered spring. A focus on relationships between evolutionary biology and important social issues, including the evolution of drug-resistant diseases, the construction and use of genetically-modified organism, human evolutionary biology, and experimental laboratory evolution. Course Attributes: Natural Science Course
BIOB 160N - Principles of Living Systems
Credits: 4. Offered autumn and summer. Unifying principles of biological structure-function relationships at different levels of organization and complexity. Consideration of reproduction, genetics, development, evolution, ecosystems, as well as the inter-relationships of the human species to the rest of life. Lab experiences illustrate biological principles underlying growth, reproduction, development, genetics and physiology. Credit not allowed for both BIOB 101N and 160N. Course Attributes: Natural Science Lab Course
BIOB 170N - Princpls Biological Diversity
Credits: 3. Offered spring and summer. Survey of the diversity, evolution and ecology of life including prokaryotes, viruses, protista, fungi, plants and animals. Course Attributes: Natural Science Course
BIOB 171N - Princpls Biological Dvrsty Lab
Credits: 2. Offered spring and summer. Coreq., BIOB 170N. The diversity of life including prokaryotes, viruses, protista, fungi, plants and animals including structure and evolutionary relationships. Course Attributes: Natural Science Lab Course Natural Science Course
BIOB 191 - Special Topics
Credits: 1 TO 6. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.
BIOB 191N - Special Topics

Credits: 1 TO 6. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics. Course Attributes: Internships/Practicums

BIOB 198 - Internship

Credits: 1 TO 6. Prereq., consent of Division. Extended classroom experience that provides practical application of learning during placement off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation. Course Attributes: Internships/Practicums

BIOB 226N - Gen Science: Earth & Life Sci

Credits: 5. Offered spring. Prereq., PHSX 225N and M 132 or M 135 or equiv. Integrated lectures, laboratory exercises, and field trips on topics in earth and biological science for prospective elementary school teachers and the non-scientist. A two-hour laboratory session is required each week and one or two Saturday field trips. Course Attributes: Natural Science Lab Course

BIOB 260 - Cellular and Molecular Biology

Credits: 4. Offered autumn and summer. Prereq. BIOB 160N (preferred) or BCH 110/111 (preferred) or B- or higher in BIOH 112; and either CHMY 123 or CHMY 143. Analytical exploration of the structure and function of the cell, the fundamental unit of life, with an emphasis on energy transformations and information flow. Topics include molecular building blocks, membranes, organelles, and mechanisms of replication, gene expression, metabolism, signal transduction, cell birth, cell death, and cell differentiation.

BIOB 272 - Genetics and Evolution

Credits: 4. Offered spring. Prereq., either BIOB 260 OR both BIOB 160N and BIOB 170N/171N; and one of M 121, 122, 151, 162, or 171. Principles and mechanisms of inheritance and evolution. Population genetics, fossil record, macroevolution, speciation, extinction, systematics, molecular evolution.

BIOB 291 - Special Topics

Credits: 1 TO 6. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

BIOB 298 - Internship

Credits: 1 TO 6. Offered intermittently. Prereq., consent of Division. Extended classroom experience that provides practical application of learning during placement off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation. Course Attributes: Internships/Practicums

BIOB 301 - Developmental Biology

Credits: 3. Offered autumn. Prereq., BIOB 260; BIOB 272 recommended. An analysis of the origin and development of form and patterns in organisms, stressing the processes of growth and differentiation in plants and animals. Graded traditional letter grade only.

BIOB 375 - General Genetics

Credits: 3. Offered spring. Prereq., BIOB 260 and 272. This course will focus on the molecular genetics of eukaryotes, with special emphasis on transmission genetics and gene structure and regulation.

BIOB 390 - Undergrad Research

Credits: 1 TO 10. (R-10) Offered every term. Prereq., consent of instr. Independent research under the direction of a faculty member. Graded credit/no credit. Course Attributes: Research & Creative Schlrshp

BIOB 391 - Special Topics

Credits: 1 TO 10. (R-10) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

BIOB 392 - Independent Study

Credits: 1 TO 10. (R-10) Offered every term. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

BIOB 398 - Internship

Credits: 1 TO 6. Offered every term. Prereq., consent of the Division. Extended classroom experience that provides practical application of learning during placement off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation. Course Attributes: Internships/Practicums

BIOB 410 - Immunology

Credits: 3. Offered autumn. Prereq., BIOB 260. Current concepts and methods in Immunology.

BIOB 411 - Immunology Laboratory

Credits: 2. Offered autumn. Coreq., BIOB 410. Modern techniques for analysis of immune responses.

BIOB 425 - Adv Cell & Molecular Biology

Credits: 3. Offered spring. Prereq., BIOB 260 and 272; BCH 380 strongly recommended. Cell structure and function, cell cycle, cellular signaling, molecular basis of cancer, regulated cell death, membrane transport, organelle dynamics, cytoskeleton, cell adhesion, and the molecular basis of learning and memory.

BIOB 440 - Biological Electron Microscopy

Credits: 2. Offered spring. Prereq., senior standing or consent of instr. Theory of electron microscopy, recent developments in transmission and scanning electron microscopy. Limited experience with the instruments.

BIOB 468 - Endocrinology

Credits: 3. Offered alternate years. Prereq., BIOB 260 and 272. Integration of fundamental concepts of endocrinology (such as hormone release, hormone transport and receptor activation) into complex systems (such as reproduction).

BIOB 480 - Conservation Genetics

Credits: 3. Offered intermittently. Prereq., BIOB 272. Genetic basis for solving biological problems in conservation including the genetics of small populations, the application of molecular genetic techniques to conservation biology and case studies of the application of genetics to conservation problems.

BIOB 483 - Phylogenics and Evolution

Credits: 3. Offered alternating spring semesters. Prereq., BIOB 260 and BIOB 272. Phylogenies, or evolutionary trees, provide insights into the history of life on Earth, including our own origins. This course focuses on the theoretical foundations of popular methods of reconstructing phylogenies from molecular sequence data and how to implement these methods with computational software for real data sets. Other current methods for testing evolutionary hypotheses with sequence data will also be introduced.

BIOB 486 - Genomics

Credits: 3. Offered autumn. Prereq., BIOB 272. Principles and mechanisms of genome biology of animals and microbes, including genome function, evolution, and basic molecular and computational methodology used in genome biology.

BIOB 490 - Adv Undergrad Research

Credits: 1 TO 10. (R-10) Offered every term. Prereq., junior or senior standing and consent of instr. Independent research under the direction of a faculty member. Graded credit/no credit. Course Attributes: Research & Creative Schlrshp

BIOB 491 - Special Topics

Credits: 1 TO 10. (R-10) Offered intermittently. Prereq., consent of instr. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

BIOB 492 - Independent Study

Credits: 1 TO 10. Offered every term. Prereq., consent of instr. Independent work under the University omnibus option. See index. Course Attributes: Omnibus Course

BIOB 494 - Seminar in Biology

Credits: 1. (R-3) Offered intermittently. Prereq., consent of instr. A review and discussion of current research. Topics vary.

BIOB 498 - Internship

Credits: 1 TO 6. Offered every term. Prereq., consent of the Division. Extended classroom experience that provides practical application of learning during placement off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation. Course Attributes: Internships/Practicums

BIOB 499 - Undergraduate Thesis

Credits: 3 TO 6. (R-6) Offered every term. Prereq., senior standing and consent of instr. Preparation of a thesis or manuscript based on undergraduate research for presentation and/or publication. Student must give oral or poster presentation at the Biological Sciences Undergraduate Research Symposium or a scientific meeting. Graded credit/no credit.

BIOB 501 - Grad Issues and Policies

Credits: 1. Prereq., graduate standing in biological sciences. Discussion of issues of importance to new graduate students, including the philosophy of graduate education, the mentor-student relationship, the role of the teaching assistant, handling ethical quandaries, library resources and bibliographic searches, animal use policies and issues, proposal writing and the publication process. Review of ongoing research by faculty in the organismal biology and ecology program. Level: Graduate

BIOB 505 - OBE Core Course - Genetics and Evolution

Credits: 3. Offered alternate years. Prereq., graduate standing. Exploration of the fundamental concepts and approaches in evolutionary biology and evolutionary genetics. Lectures and discussions, with an emphasis on primary literature, classic and contemporary. Level: Graduate

BIOB 506 - OBE Core Course - Ecology