

BIOLOGY - TEACHER PREPARATION GENERAL SCIENCE BROADFIELD

Bachelor of Arts - Biology - General Science Broadfield

College Humanities & Sciences

Degree Specific Credits: 72

Required Cumulative GPA: 2.75

Catalog Year: 2017-2018

General Education Requirements

Information regarding these requirements can be found in the General Education Section (<http://catalog.umn.edu/academics/general-education-requirements>) of the catalog.

Summary

Lower Division Courses in the Content Areas	52
Biology Content Courses	
Chemistry Content Courses	
Earth Sciences Content Courses	
Earth Sciences Content Courses - Environmental Geosciences	
Physics Content Courses	
Upper Division Content Courses	5
Required Content Courses Outside of the Major	8
Mathematics - Calculus	
Mathematics - Statistics	
Upper Division Writing Expectation for the Major	6
Total Hours	71

Lower Division Courses in the Content Areas - Biology, Chemistry, Earth Sciences, and Physics

Note: A minimum of 10 credits is required in each of the four content areas.

Biology Content Courses

Rule: All of the following courses are required

Note: AP Biology will substitute 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	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-

Chemistry Content Courses

Rule: All of the following courses are required.

Note: CHMY 141N/CHMY 142N & CHMY 143N/CHMY 144N should be completed before attempting CHMY 123.

CHMY 123	Introduction to Organic and Biochemistry	3.000
CHMY 141N	College Chemistry I	4
CHMY 142N	College Chemistry I Lab	1
CHMY 143N	College Chemistry II	4
CHMY 144N	College Chemistry II Lab	1
CHMY 485	Laboratory Safety	1
Total Hours		14

Minimum Required Grade: C-

Earth Sciences Content Courses

Rule: All of the following courses are required

Note: ASTR 132N/ASTR 135N are NOT acceptable substitutes for ASTR 131N/ASTR 134N.

ASTR 131N	Planetary Astronomy	3
ASTR 134N	Planetary Astronomy Lab	1
GEO 101N	Introduction to Physical Geology	3
GEO 102N	Introduction to Physical Geology Lab	1
Total Hours		8

Minimum Required Grade: C-

Earth Sciences Content Courses - Environmental Geosciences

Rule: Complete at least one of the following courses

GEO 105N	Oceanography	3
	or GEO 103N Introduction to Environmental Geology	

Minimum Required Grade: C-

Physics Content Courses

Select one of the following physics sequences: 10

Algebra- and Trigonometry-based:		
PHSX 205N	College Physics I	
& PHSX 206N	and College Physics I Laboratory	
PHSX 207N	College Physics II	
& PHSX 208N	and College Physics II Laboratory	
Calculus-based:		
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)	
Total Hours		10

Minimum Required Grade: C-

Upper Division Content Courses

Rule: All of the following courses are required.

BIOE 370	General Ecology	3
BIOE 371	Gen Ecology Lab (equiv to 271)	2
Total Hours		5

Minimum Required Grade: C-

Required Content 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	Applied Calculus	4
or M 171	Calculus I	
Total Hours		4

Minimum Required Grade: C-

Mathematics - Statistics

Rule: The following course is required

STAT 216	Introduction to Statistics	4
Total Hours		4

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 General Science Broadfield requires one 2/3 writing course (BIOE 371). The Advanced College Writing Requirement is completed with one additional course, chosen from any of the following. The recommended course is B100 434 (taken with B100 433), which are required for the Teaching Biology endorsement.

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-

Teaching General Science Broadfield Track

Individuals interested in teaching in K-12 schools must complete a degree in the content area they want to teach plus the teacher preparation program through the Department of Curriculum and Instruction. Individuals must complete the teaching major/teaching track within that degree program, which may contain different course requirements than the academic major since the sequence of courses is designed to meet state standards. Upon completion of the degree program with the teaching track and the secondary licensure program, one will be eligible for a standard Montana teaching license in this content area.

- Secondary Education Licensure Program (<http://www.coehs.umt.edu/departments/currinst/undergradprograms/seced/default.php>)
- Licensure Degree Requirements (<http://catalog.umt.edu/past-catalogs/2017-2018/colleges-schools-programs/education-human-sciences/teaching-learning/lic-secondary-licensure>)

This is an advising track only and not an official program as recognized by the University of Montana (UM) or the Montana University System. This information will not appear on your UM transcript, diploma, university lists, student data system, or university publication. You do not fill out a major change for a track.

Note: This option provides students with coursework in biology, chemistry, physics, earth sciences and mathematics needed to be certified by the State of Montana in broad-field science. This allows students to teach secondary sciences—biology, chemistry, physics, and earth science (in middle and high schools). This option is appropriate for students interested in teaching science in smaller, more rural schools. In order to be licensed to teach secondary science, students must be admitted to the Teacher Education Program through the Phyllis J. Washington College of Education and Human Sciences.

Education

Rule: The following course is required

Note: The course number EDU 497 covers many different teaching methods courses. The section of EDU 497 entitled "Methods: 5 - 12 Science" is required for the General Science Broadfield.

EDU 497	Teaching and Assessing	4
Total Hours		4

Minimum Required Grade: C-

Secondary Teaching Licensure

Note: For endorsement to teach general science, a student also must gain admission to the Teacher Education Program and meet all the requirements for secondary teaching licensure (see the College of Education & Human Sciences (<http://catalog.umt.edu/past-catalogs/2017-2018/colleges-schools-programs/education-human-sciences>))