BROADFIELD SCIENCE BACHELOR OF SCIENCE DEGREE

Program Learning Outcomes

Upon successful completion of this program, students will be able to:

- Interpret and translate data to mathematically and conceptually solve science-based problems with industrial, environmental, and academic applications.
- Demonstrate multi-disciplinary competency in scientific reasoning, laboratory and field techniques (including modern instrumentation), and computer/software skills.
- Demonstrate scientific literacy and be able to disseminate scientific information.

Required Courses

Code	Title	Credits
General Education Requirements (https://catalog.msubillings.edu/undergraduate/general-education-requirements/)		**31**
Note: 9 credits will be filled from below – 6 Natural Science and 3 Mathematics – leaving 22 needed here.		
Broadfield Science Core Requirements		
Biology		
BIOB 160 & BIOB 161	Principles of Living Systems and Principles Living Systems Lab *	4
BIOB 260 & BIOB 261	Cellular & Molecular Biology and Cellular & Molecular Biol Lab	4
Total Biology credits		8
Chemistry		
CHMY 141 & CHMY 142	College Chemistry I and College Chemistry I Lab *	5
CHMY 143 & CHMY 144	College Chemistry II and College Chemistry II Lab	5
Total Chemistry credits		10
Earth Science		
GEO 101 & GEO 102	Intro to Physical Geology and Intro to Physical Geology Lab *	4
GEO 211 & GEO 212	Earth History & Evolution and Earth History & Evolution Lab	4
Total Earth Science credits		8
Physics		
PHSX 205 & PHSX 206	College Physics I and College Physics I Lab *	4
Total Physics credits		4
Geography/Geographic Information Systems		
GPHY 282	Mapping Techniques	3
Total Geography/GIS credits		3
Scientific Inquiry and Experiential Learning		
SCIN 289	Scientific Inquiry	1
SCIN 499	Senior Thesis/Capstone	1
Select a minimum of 2 credits from the following:		2
BIOB 490	Undergraduate Research	
BIOB 498	Internship/Cooperative Educ	
CHMY 490	Undergraduate Research	
CHMY 498	Internship/Cooperative Educ	
GEO 490	Undergraduate Research	
GEO 498	Cooperative Educ/Internship	
PHSX 490	UG Research	
PHSX 498	Internship/Cooperative Educ	
Total Scientific Inquiry and Experiential Learning credits		4
Total Core Requirement Credits		*37*
Select one of the following concentrations:		
I. Concentration in Botany		
Required Botany Core		
BIOO 320 & BIOO 321	General Botany and General Botany Lab	4
BIOO 433 & BIOO 434	Plant Physiology and Plant Physiology Lab	4
BIOO 435 & BIOO 436	Plant Systematics and Plant Systematics Lab	4
Total Botany Core Credits		12
Additional Science Courses		
BIOE 370 & BIOE 371	General Ecology and General Ecology Lab	4
BIOB 375 & BIOB 376	General Genetics and General Genetics Lab	4
BIOM 360 & BIOM 361	General Microbiology and General Microbiology Lab	4
CHMY 211 & CHMY 212	Elements of Organic Chemistry and Elements of Organic Chem Lab	4
CHMY 321 & CHMY 322	Organic Chemistry I and Organic Chemistry Lab I	4
Total Additional Science Credits		16
Upper Division Science Electives		
Selected in consultation with advisor from the following rubrics: BCH, BIOB, BIOE, BIOO, CHMY, ERTH, GEO, GPHY, PHSX		10
Math Requirements		
Select 2 courses from the following:		8
STAT 216	Introduction to Statistics *	4
STAT 217	Interm Statistical Concepts	4
PSYX 225 & PSYX 226	Research Design and Analysis and Research Design and Analysis L	4
Total Credits for Botany Concentration		*46*
II. Concentration in Environmental Science		
Required Environmental Science Core		
BIOE 370 & BIOE 371	General Ecology and General Ecology Lab	4
BIOO 320 & BIOO 321	General Botany and General Botany Lab	4
BIOO 435 & BIOO 436	Plant Systematics and Plant Systematics Lab	4
CHMY 311 & CHMY 312	Analytical Chem-Quant Analysis and Analyticl Chm Lab-Quant Anlsys	4
ENST 210	Intro to Environmental Studies	3
ENST 385	Envir Impact & Policy Analysis	3
ERTH 303	Weather and Climate	4
GEO 309	Sedimentation and Stratigraphy	3

GPHY 380	Principles of GIS	3
Total Environmental Science Core Credits		32
Upper Division Science Electives		
Selected in consultation with advisor from the following rubrics:		6
BCH, BIOB, BIOE, BIOM, BIOO, CHMY, ERTH, GEO, GPHY, PHSX		
Math Requirements		
Select 2 courses from the following:		7-8
CHMY 250	Applied Math for the Sciences	3
M 171	Calculus I *	4
M 172	Calculus II	4
STAT 216	Introduction to Statistics *	4
STAT 217	Interm Statistical Concepts	4
PSYX 225 & PSYX 226	Research Design and Analysis and Research Design and Analysis L	4
Total Credits for Environmental Science Concentration		*45-46*
III. Concentration in Earth Science		
Required Earth Science Core		
GEO 205	Mineralogy	4
GEO 309	Sedimentation and Stratigraphy	3
GEO 315	Structural Geology	4
Select one of the following courses:		
ERTH 307	Principles of Geomorphology	4
GEO 428	Field Methods	3
Total Earth Science Core Credits		14-15
Additional Science Courses		
CHMY 311 & CHMY 312	Analytical Chem-Quant Analysis and Analyticl Chm Lab-Quant Anlsys	4
ERTH 303	Weather and Climate	4
GPHY 380	Principles of GIS	3
Total Additional Science Credits		11
Upper Division Science Electives		
Selected in consultation with advisor from the following rubrics: BCH, BIOB, BIOE, BIOO, CHMY, ERTH, GEO, GPHY, PHSX		12
Math Requirements		
Select 2 courses from the following:		7-8
CHMY 250	Applied Math for the Sciences	3
M 171	Calculus I *	4
M 172	Calculus II	4
Total Credits for Earth Science Concentration		*44-46*
Total Science Credits		**81-83**
Unrestricted Electives		**15-17**
Total Minimum Credits		**120**

* May satisfy General Education requirements.

Certain courses in this program have prerequisites; students should check course descriptions for required prerequisites.

Suggested Plan of Study

Code	Title	Credits
First Year		
Fall		
BIOB 160 & BIOB 161	Principles of Living Systems and Principles Living Systems Lab	4
CHMY 141 & CHMY 142	College Chemistry I and College Chemistry I Lab	5
GEO 101 & GEO 102	Intro to Physical Geology and Intro to Physical Geology Lab	4
COLS 108	The College Experience	1
Spring		
CHMY 143 & CHMY 144	College Chemistry II and College Chemistry II Lab	5
GEO 211 & GEO 212	Earth History & Evolution and Earth History & Evolution Lab	4
General Education		3
Concentration		Varies
Second Year		
Fall		
BIOB 260 & BIOB 261	Cellular & Molecular Biology and Cellular & Molecular Biol Lab	4
GPHY 282	Mapping Techniques	3
General Education		3
Math		Varies
Concentration		Varies
Spring		
SCIN 289	Scientific Inquiry	1
General Education		3
Math		Varies
Concentration		Varies
Upper Division Science Electives		Varies
Unrestricted Electives		Varies
Third Year		
Fall		
PHSX 205 & PHSX 206	College Physics I and College Physics I Lab	4
Research/Internship		1
General Education		3
Concentration		Varies
Upper Division Science Electives		Varies
Unrestricted Electives		Varies
Spring		
Research/Internship		1
General Education		3
Concentration		Varies
Upper Division Science Electives		Varies
Unrestricted Electives		Varies
Fourth Year		
Fall		
General Education		3
Concentration		Varies
Upper Division Science Electives		Varies
Unrestricted Electives		Varies
Spring		
SCIN 499	Senior Thesis/Capstone	1
General Education		3

Concentration	Varies
Upper Division Science Electives	Varies
Unrestricted Electives	Varies