

BIOLOGY BACHELOR OF SCIENCE DEGREE

Program Learning Outcomes

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

- Describe the cellular basis of living organisms and illustrate the functions of cellular components.
- Describe the molecular basis of cellular function, including inheritance and genetics.
- Describe the major differences between different clades of organisms and explain how these differences relate to ecological attributes.
- Describe the chemical basis of life and the biochemical reactions that make it possible.
- Describe evolutionary processes and explain how populations change over time.
- Describe ecological principles and interactions between the biotic and abiotic worlds.
- Interpret data and use analytical skills to arrive at conclusions.

Required Courses

Code	Title	Credits
General Education Requirements (https://catalog.msubillings.edu/undergraduate/general-education-requirements/)		31

Students should consult with an academic advisor before registering for General Education courses in order to minimize the number of courses needed to satisfy the requirements of the major.¹

NOTE: 9 credits will be filled with requirements below, leaving 22 credits needed in General Education.

Biology Requirements		
BIOB 160	Principles of Living Systems *	3
BIOB 161	Principles Living Systems Lab *	1
BIOB 170	Principles of Bio Diversity	3
BIOB 171	Principles Bio Diversity Lab	1
BIOB 260	Cellular & Molecular Biology	3
BIOB 261	Cellular & Molecular Biol Lab	1
BIOB 375	General Genetics	3
BIOB 376	General Genetics Lab	1
BIOB 487	Bioinformatics	4
BIOB 490	Undergraduate Research	2
BIOB 499	Senior Thesis/Capstone	1
BIOE 370	General Ecology	3
BIOE 371	General Ecology Lab	1
BIOM 360	General Microbiology	3
BIOM 361	General Microbiology Lab	1
Upper Division Science Electives		12
Selected in consultation with advisor from the following rubrics: BCH, BIOB, BIOE, BIOH, BIOM, BIOO, CHMY, ERTH, GEO, GPHY, PHSX		
Subtotal		43

Chemistry Requirements

CHMY 141	College Chemistry I *	4
CHMY 142	College Chemistry I Lab *	1
CHMY 143	College Chemistry II	4
CHMY 144	College Chemistry II Lab	1

CHMY 321	Organic Chemistry I	3
CHMY 322	Organic Chemistry Lab I	1
CHMY 323	Organic Chemistry II	3
CHMY 324	Organic Chemistry Lab II	1
BCH 380	Biochemistry	3
BCH 381	Biochemistry Lab	1
Subtotal		22

Mathematics/Statistics Requirement

Select two of the following:		7-8
CHMY 250	Applied Math for the Sciences	
M 161	Survey of Calculus *	
or M 171	Calculus I	
M 172	Calculus II	
STAT 216	Introduction to Statistics *	
STAT 217	Interm Statistical Concepts	
or PSYX 225	Research Design and Analysis	
& PSYX 226	and Research Design and Analysis L	
Subtotal		7-8

Physics Requirements

Select one of the following options:		
Option 1:		8
PHSX 205	College Physics I	
& PHSX 206	and College Physics I Lab *	
PHSX 207	College Physics II	
& PHSX 208	and College Physics II Lab	
Option 2:		10
PHSX 220	Physics I	
& PHSX 221	and Physics I Lab	
PHSX 232	Physics II & Thermo	
& PHSX 233	and Physics II & Thermo Lab	
Subtotal		8-10

Unrestricted Electives	V
	18

The total number of elective credits required for the degree will be determined by the number of courses a student elects to take which fulfill both the General Education requirements and the major requirements. Electives should be chosen in consultation with an academic advisor.

Total Minimum Credits	120
------------------------------	------------

¹ The following General Education courses also satisfy requirements in the major: BIOB 160, CHMY 141, and either M 171 or STAT 216.

* May satisfy General Education requirements.

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

Suggested Plan of Study

Code	Title	Credits
First Year		
Fall		
BIOB 160	Principles of Living Systems	4
& BIOB 161	and Principles Living Systems Lab	
CHMY 141	College Chemistry I	5
& CHMY 142	and College Chemistry I Lab	
General Education		6

Total		15
Spring		
BIOB 170 & BIOB 171	Principles of Bio Diversity and Principles Bio Diversity Lab	4
CHMY 143 & CHMY 144	College Chemistry II and College Chemistry II Lab	5
Math requirement		4
General Education		3
Total		16
Second Year		
Fall		
BIOB 260 & BIOB 261	Cellular & Molecular Biology and Cellular & Molecular Biol Lab	4
CHMY 321 & CHMY 322	Organic Chemistry I and Organic Chemistry Lab I	4
General Education		3
Math requirement		4
Total		15
Spring		
BIOB 375 & BIOB 376	General Genetics and General Genetics Lab	4
CHMY 323 & CHMY 324	Organic Chemistry II and Organic Chemistry Lab II	4
General Education		6
Total		14
Third Year		
Fall		
BCH 380 & BCH 381	Biochemistry and Biochemistry Lab	4
BIOE 370 & BIOE 371	General Ecology and General Ecology Lab	4
Select one of the following:		4-5
PHSX 205 & PHSX 206	College Physics I and College Physics I Lab	
PHSX 220 & PHSX 221	Physics I and Physics I Lab	
Science Electives		2-3
Total		15
Spring		
Select one of the following:		4-5
PHSX 207 & PHSX 208	College Physics II and College Physics II Lab	
PHSX 232 & PHSX 233	Physics II & Thermo and Physics II & Thermo Lab	
BIOB 487	Bioinformatics	4
Science Electives		3
Electives		3-4
Total		15
Fourth Year		
Fall		
BIOM 360 & BIOM 361	General Microbiology and General Microbiology Lab	4
BIOB 490	Undergraduate Research	1
Science Electives		3

Gen Ed/Electives		7
Total		15
Spring		
BIOB 490	Undergraduate Research	1
BIOB 499	Senior Thesis/Capstone	1
Science Electives		3
Gen Ed/Electives		10
Total		15