

BIOLOGY (B.S.)

The BS in Biology is for students who are mostly interested in the Medical Health Professions or students who are interested in research and pursuing a master's or PhD degree after graduation or working in a lab-based profession. Students can select between a research focused track or a pre-medical professions track (with certain restrictions) to complete their studies. A third, general Biology, track is included to allow students to pursue a general BS in Biology if they do not wish to pursue the BA in Biology program or the pre-medical professions and research tracks.

For the Research and General Biology tracks, students must have a 2.5 overall GPA at the end of their first year and they must have passed either BIOL112 or BIOL113, and either CHEM106 or CHEM120, and either MATH122 or MATH111. In order to be allowed to continue in the Pre-Medical Professions track, students must have completed all freshman and sophomore courses required in the major and have a minimum major GPA of 3.2.

Degree Requirements Overview

Code	Title	Credits
	New Student Seminar	1
	SEEDS General Education Requirements	24-27
	Major Requirements	75
	Free Electives	20-17
	Total Credits	120

Major Requirements

Code	Title	Credits
Biology Major Requirements		
BIOL 112	Principles of Biology: Introduction to the Cell	4
BIOL 113	Principles of Biology: Organisms and Diversity	4
BIOL 213	Introduction to Ecology	4
BIOL 230	Cell and Molecular Biology	4
BIOL 380	Genetics	4
Collateral Requirements		
<i>Chemistry</i>		
CHEM 120	General Chemistry I	4
CHEM 121	General Chemistry II	4
CHEM 230	Organic Chemistry I	3
CHEM 231	Organic Chemistry II	3
CHEM 232	Experimental Organic Chemistry I	2
<i>Mathematics</i>		
MATH 122	Calculus I	4
STAT 230	Data Science and Statistics	3
<i>Physics</i>		
PHYS 193	College Physics I	4
PHYS 194	College Physics II	4
Biology Professional Track Requirements		
	Complete one of the following tracks: Research, Pre-Medical Professions, or General Biology. See requirements below.	24
	Total Credits	75

Professional Track - Research

Code	Title	Credits
Required Courses		
BIOL 417	Evolutionary Biology	3
	Complete two times for 4 credits each time:	8
BIOL 418	Biology Independent Research	
Biology Major Electives		
	Complete 13 credits from the list below. One lab course must be completed.	13
	Total Credits	24

Professional Track - Pre-Medical Professions

Code	Title	Credits
Required Courses		
BIOL 340	Advanced Human Anatomy and Physiology I	4
BIOL 341	Advanced Human Anatomy and Physiology II	4
BIOL 350	Microbiology	4
CHEM 370	Biochemistry I	3
PSYC 101	Introduction to Psychology	3
Biology Major Electives		
	Complete 6 credits from the list below.	6
	Total Credits	24

Professional Track - General Biology

Code	Title	Credits
Required Course		
BIOL 417	Evolutionary Biology	3
Biology Major Electives		
	Complete 21 credits from the list below. One lab course must be completed.	21
	Total Credits	24

Biology Major Electives

Code	Title	Credits
BIOL 300	Environmental Biology and Related Controversial Issues	3
BIOL 315	Science Literacy and Communication	3
BIOL 319	Genes, Brains, and Behavior	4
BIOL 320	Social Neurobiology	3
BIOL 330	Introduction to Animal Behavior	3
BIOL 340	Advanced Human Anatomy and Physiology I	4
BIOL 341	Advanced Human Anatomy and Physiology II	4
BIOL 350	Microbiology	4
BIOL 351	Introduction to Aquatic Ecology	4
BIOL 360	Introduction to Bio-Imaging	3
BIOL 370	Principles of Ecology	3
BIOL 380	Genetics	4
BIOL 404	Plant and Animal Histological Techniques	3
BIOL 405	Cell Culture	3
BIOL 406	Scanning Electron Microscopy	4
BIOL 409	Externship in Biological Research (Co-operative Education)	1-4
BIOL 410	Toxicology	3

BIOL 411	Introduction to Transmission Electron Microscopy	4
BIOL 415	Population Genetics	3
BIOL 417	Evolutionary Biology	3
BIOL 418	Biology Independent Research	1-4
BIOL 420	Economic Botany	3
BIOL 422	Community Ecology	3
BIOL 425	Elementary Plant Physiology	3
BIOL 426	New Jersey Flora	4
BIOL 429	Herpetology	4
BIOL 430	Ornithology	4
BIOL 431	Entomology	3
BIOL 432	Medical Entomology	3
BIOL 433	Developmental Biology	4
BIOL 434	Molecular Biology	3
BIOL 435	Experimental Molecular Biology	3
BIOL 436	Phylogenetic Zoology	4
BIOL 439	Biology of Animal Parasites	3
BIOL 440	Gross Mammalian Anatomy	4
BIOL 441	Comparative Anatomy of Vertebrates	4
BIOL 442	Human Physiology	4
BIOL 443	Vertebrate Embryology	4
BIOL 444	Cell Physiology	3
BIOL 445	Immunology	3
BIOL 446	Endocrinology	3
BIOL 447	Fundamentals of Pharmacology	3
BIOL 450	Medical Microbiology	3
BIOL 451	Comparative Animal Physiology	3
BIOL 457	Virology	3
BIOL 458	Microbial Genetics	3
BIOL 460	Biological Oceanography	3
BIOL 461	Aquatic Ecology	3
BIOL 467	Biology of the Fishes	4
BIOL 468	Neurobiology	3
BIOL 475	Medical Genetics	3
BIOL 476	Biology of Cancer	3
BIOL 480	Research Community I: Organism Biology	4
BIOL 481	Research Community II: Organism Biology	4
BIOL 482	Research Community I: Molecular Biology	4
BIOL 483	Research Community II: Molecular Biology	4
BIOL 484	Research Community I: Ecology	4
BIOL 485	Research Community II: Ecology	4
BIOL 486	Special Topics in Biology	3-4
BIOL 487	Statistical Genomics	3
BIOL 488	Special Topics in Cell and Molecular Biology	3-4
BIOL 489	Special Topics in Organismal Biology	3-4
BIOL 490	Senior Seminar in Biology	3
BIOL 491	Research in Biology Literature	1
BIOL 492	Senior Colloquium	1
BIOL 493	Molecular Ecology	3
BIOL 495	Special Topics in Ecology	3-4
BIOL 497	Genomics	3

New Student Seminar

Code	Title	Credits
Students in the Adult Learner program must take GNED 100.		
Complete one course from the following. Some courses may be restricted by major. Consult with an academic advisor.		1
ADVS 198	Pathways to Success	
CHEM 190	Freshman Seminar in Chemistry	
FYS 100	First Year Seminar	
GNED 100	Adult Academic Success Seminar	
GNED 199	New Student Seminar	
HPEM 199	Freshman Seminar in Health and Physical Education	
IDS 155	Pathways to Adult Learning	
JUST 199	New Student Seminar	
MATH 102	New Student Experience for Mathematical Sciences	
MUGN 199	Freshman Seminar for Music Majors	
NURS 199	Introduction to Nursing	
POLS 199	Freshman Seminar in Political Science and Law	

SEEDS General Education Requirements

Click here for a list of courses that fulfill the SEEDS requirements. (<http://catalog.montclair.edu/programs/seeds-general-education-requirements/>)

Code	Title	Credits
Foundations		
<i>Effective Writing I</i>		
Complete one Effective Writing I course.		3
<i>Effective Writing II</i>		
Complete one Effective Writing II course.		3
<i>Interactive Communication</i>		
Complete one Interactive Communication course.		3
<i>Quantitative Reasoning</i>		
Fulfilled by MATH 122 in the major.		
<i>Political and Civic Life</i>		
Complete one Political and Civic Life course.		3
<i>World Language</i>		
Complete two sequential classes in one World Language when starting at the Beginner I or Beginner II level. Complete one class when starting at the Intermediate/Advanced Level.		3-6
Exploration		
Complete one course from four different Exploration categories:		9
<i>Analyzing Cultures and Societies</i>		
<i>Creative Expression</i>		
<i>Ethical Inquiry</i>		
<i>Historical Thinking</i>		
<i>Literary and Artistic Analysis</i>		
<i>Scientific Reasoning</i>		
Fulfilled by BIOL 112 in the major.		
Total Credits		24-27

Recommended Roadmap to Degree Completion

This recommended degree plan is provided as an outline for students to follow in order to complete their degree requirements within four years and 120 credits. This plan is a recommendation and MUST be used in consultation with their academic advisor. Important note: Students should be aware this plan assumes no pre-requisite coursework is required. If pre-requisite coursework is needed, students may have additional requirements to fulfill which do not appear on the plan.

General Biology Track

First Year

Fall	Credits	Spring	Credits
New Student Seminar	1	SEEDS: Effective Writing II	3
SEEDS: Effective Writing I	3	SEEDS: Interactive Communication	3
SEEDS: Exploration 1	3	SEEDS: Political and Civic Life	3
BIOL 112 (Fulfills SEEDS: Exploration 2 - Scientific Reasoning)	4	BIOL 113	4
MATH 122 (Fulfills SEEDS: Quantitative Reasoning)	4	STAT 230	3
15		16	

Second Year

Fall	Credits	Spring	Credits
SEEDS: Exploration 3	3	BIOL 230	4
BIOL 213	4	CHEM 121	4
CHEM 120	4	PHYS 194	4
PHYS 193	4	SEEDS: Exploration 4	3
15		15	

Third Year

Fall	Credits	Spring	Credits
CHEM 230	3	CHEM 231	3
CHEM 232	2	BIOL 417	3
BIOL 380	4	Major Elective	4
Major Elective	4	Major Elective	4
Major Elective	3		
16		14	

Fourth Year

Fall	Credits	Spring	Credits
SEEDS: World Language 1	3	SEEDS: World Language 2	3
Major Elective	3	Major Elective	3
Free Elective	4	Free Elective	3
Free Elective	3	Free Elective	3
Free Elective	3	Free Elective	1
16		13	

Total Credits 120

Research Track

First Year

Fall	Credits	Spring	Credits
New Student Seminar	1	SEEDS: Effective Writing II	3
SEEDS: Effective Writing I	3	SEEDS: Interactive Communication	3
SEEDS: Exploration 1	3	SEEDS: Political and Civic Life	3
BIOL 112 (Fulfills SEEDS: Exploration 2 - Scientific Reasoning)	4	BIOL 113	4
MATH 122 (Fulfills SEEDS: Quantitative Reasoning)	4	STAT 230	3
15		16	

Second Year

Fall	Credits	Spring	Credits
SEEDS: Exploration 3	3	SEEDS: Exploration 4	3
BIOL 230	4	BIOL 213	4
CHEM 120	4	CHEM 121	4
PHYS 193	4	PHYS 194	4
15		15	

Third Year

Fall	Credits	Spring	Credits
CHEM 230	3	CHEM 231	3
CHEM 232	2	BIOL 417	3
BIOL 380	4	BIOL 418	4
BIOL 418	4	Major Elective	4
Major Elective	3		
16		14	

Fourth Year

Fall	Credits	Spring	Credits
SEEDS: World Language 1	3	SEEDS: World Language 2	3
Major Elective	3	Major Elective	3
Free Elective	4	Free Elective	3
Free Elective	3	Free Elective	3
Free Elective	3	Free Elective	1
16		13	

Total Credits 120

Pre-Medical Professions Track

First Year

Fall	Credits	Spring	Credits
New Student Seminar	1	SEEDS: Effective Writing II	3
SEEDS: Effective Writing I	3	SEEDS: Interactive Communication	3
SEEDS: Exploration 1	3	SEEDS: Political and Civic Life	3

BIOL 112 (Fulfills SEEDS: Exploration 2 - Scientific Reasoning)	4 BIOL 113	4
MATH 122 (Fulfills SEEDS: Quantitative Reasoning)	4 STAT 230	3

15 **16**

Second Year

Fall	Credits	Spring	Credits
SEEDS: Exploration 3		3 BIOL 213	4
BIOL 230		4 CHEM 121	4
CHEM 120		4 PHYS 194	4
PHYS 193		4 SEEDS: Exploration 4	3

15 **15**

Third Year

Fall	Credits	Spring	Credits
CHEM 230		3 CHEM 231	3
CHEM 232		2 BIOL 417	3
BIOL 380		4 BIOL 341	4
BIOL 340		4 BIOL 350	4
PSYC 101		3	

16 **14**

Fourth Year

Fall	Credits	Spring	Credits
SEEDS: World Language 1		3 SEEDS: World Language 2	3
CHEM 370		3 Major Elective	3
Free Elective		4 Free Elective	3
Free Elective		3 Free Elective	3
Free Elective		3 Free Elective	1

16 **13**

Total Credits 120