BIOLOGY - RESEARCH CONCENTRATION (B.S.)

The BS in Biology Research Concentration is for students who are mostly interested in research and pursuing a Master's or Doctoral degree after graduation or working in a lab-based profession. Students must have a 2.5 overall GPA at the end of their first year and they must have passed either BIOL 112 or BIOL 113, and either CHEM 106 or CHEM 120, and either MATH 122 or MATH 111.

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 Core		
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		
Chemistry		
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
Mathematics		
MATH 122	Calculus I	4
STAT 230	Data Science and Statistics	3
Physics		
PHYS 193	College Physics I	4
PHYS 194	College Physics II	4
Electives or Concentration Requirements		
Complete 24 credits from the concentration or electives list below:		24
Total Credits		**75**

Research Concentration

Code	Title	Credits
BIOL 417	Evolutionary Biology	3
Concentration Requirements		
Complete two times for 4 credits each time:		8
BIOL 418	Biology Independent Research	
Major Electives		
Complete 13 credits from the list below.		13
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 405	Cell Culture	3
BIOL 409	Externship in Biological Research (Co-operative Education)	1-4
BIOL 410	Toxicology	3
BIOL 415	Population Genetics	3
BIOL 417	Evolutionary Biology	3
BIOL 418	Biology Independent Research	1-4
BIOL 422	Community Ecology	3
BIOL 425	Elementary Plant Physiology	3
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 440	Gross Mammalian Anatomy	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 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 482	Research Community I: Molecular Biology	4
BIOL 484	Research Community I: Ecology	4
BIOL 486	Special Topics in Biology	3-4
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 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		
Effective Writing I		
Complete one Effective Writing I course.		3
Effective Writing II		
Complete one Effective Writing II course.		3
Interactive Communication		
Complete one Interactive Communication course.		3
Quantitative Reasoning		
Fulfilled by MATH 122 in the major.		
Political and Civic Life		
Complete one Political and Civic Life course.		3
World Language		
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
Analyzing Cultures and Societies		
Creative Expression		
Ethical Inquiry		
Historical Thinking		
Literary and Artistic Analysis		
Scientific Reasoning		
Fulfilled by BIOL 112 in the major.		
Total Credits		**24-27**

Recommended Roadmap to Program of Study Completion

This recommended degree plan is provided as an outline for students to follow in order to complete their program of study 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.

First Year

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

Second Year

Fall	Credits	Spring	Credits
BIOL 230	4	BIOL 213	4
CHEM 120	4	CHEM 121	4
PHYS 193	4	PHYS 194	4
SEEDS: Exploration 3	3	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 418	4
BIOL 418	4	Major Elective	4
Major Elective	3		
	16		**14**

Fourth Year

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

Free Elective	3 Free Elective	1
	16	**13**

Total Credits 120