BIOLOGY - ENVIRONMENTAL SCIENCE CONCENTRATION (B.S.)

Certain pre-qualified students may be accepted into the major; others will need to complete the following:

2.5 overall GPA required

Please note: The Biology, Molecular Biology, and Marine Biology and Coastal Science majors have retention policies. By the end of their second semester in the major (i.e. spring semester), students must maintain a minimum GPA of 2.5 and have completed the following courses with a C- or better grade: BIOL112 or BIOL113, and CHEM106 or CHEM120, and MATH111 or AMAT120.

Students are required to meet with their assigned advisor.

Contact: Dr. Dirk Vanderklein, Science Hall 107A, vanderkleid@montclair.edu.

Degree Requirements Overview

Code	Title	Credits
New Student Seminar		1
SEEDS: General Education Requirements		24-27
Major Requirements		72-75
Free Electives		23-17
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
Major Electives		
Select two courses from the list below.		7
Environmental Science Concentration		
Required Courses		
BIOL 417	Evolutionary Biology	3
EAES 105	Physical Geology	4
Concentration Electives		
Select three courses from the list below.		9-12
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
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
Total Credits		**72-75**

Concentration Electives

Code	Title	Credits
BIOL 300	Environmental Biology and Related Controversial Issues	3
BIOL 330	Introduction to Animal Behavior	3
BIOL 370	Principles of Ecology	3
BIOL 406	Scanning Electron Microscopy	4
BIOL 429	Herpetology	4
BIOL 430	Ornithology	4
BIOL 431	Entomology	3
BIOL 436	Phylogenetic Zoology	4
BIOL 440	Gross Mammalian Anatomy	4
BIOL 451	Comparative Animal Physiology	3
BIOL 460	Biological Oceanography	3
BIOL 461	Aquatic Ecology	3
BIOL 467	Biology of the Fishes	4
BIOL 480	Research Community I: Organism Biology	4
BIOL 481	Research Community II: Organism 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 489	Special Topics in Organismal Biology	3-4
BIOL 495	Special Topics in Ecology	3
EAES 210	Introduction to GIS and Remote Sensing	3
EAES 230	Hydrology	3
EAES 240	Earth System History	4
EAES 250	Introduction to Marine Sciences	4
EAES 301	Climatology	3
EAES 302	Structural Geology	3
EAES 303	Environmental Field Methods	3
EAES 310	Geographic Information Systems (GIS)	3
EAES 320	Igneous Metamorphic Petrology	4
EAES 322	Environmental Geochemistry	3
EAES 330	Fluvial Geography	3
EAES 331	Geohydrology	3
EAES 332	Hydroclimatology	3
EAES 337	Environmental Isotope Geochemistry	3
EAES 340	Sedimentology	4
EAES 341	Principles of Soil Science	3
EAES 350	Oceanography	3
EAES 401	Geo-Ecology	3
EAES 441	Stratigraphy	4
EAES 451	Coastal Marine Geology	4

Major Electives

Code	Title	Credits
BIMS 220	Introduction to Marine Biology	4
BIOL 300	Environmental Biology and Related Controversial Issues	3
BIOL 330	Introduction to Animal Behavior	3
BIOL 350	Microbiology	4
BIOL 370	Principles of Ecology	3
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 418	Biology Independent Research	1-4
BIOL 420	Economic Botany	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 460	Biological Oceanography	3
BIOL 461	Aquatic Ecology	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 484	Research Community I: Ecology	4
BIOL 485	Research Community II: Ecology	4
BIOL 486	Special Topics in Biology	3-4
BIOL 489	Special Topics in Organismal Biology	3-4
BIOL 493	Molecular Ecology	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 Languages		
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 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.

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 - 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 2	3	BIOL 230	4
BIOL 213	4	CHEM 121	4
CHEM 120	4	PHYS 194	4
PHYS 193	4	SEEDS: Exploration 3	3
	15		**15**

Third Year

Fall	Credits	Spring	Credits
CHEM 230	3	CHEM 231	3
BIOL 380	4	BIOL 417	3
EAES 105	4	Concentration Elective	4
Concentration Elective	3	Major Elective	4
	14		**14**

Fourth Year

Fall	Credits	Spring	Credits
SEEDS: World Language 1	3	SEEDS: World Language 2	3
Major Elective	3	Concentration Elective	3
Free Elective	4	Free Elective	3
Free Elective	3	Free Elective	3
Free Elective	3	Free Elective	3
	16		**15**

Total Credits 120