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.

Program Requirements Overview

Unless otherwise noted, 120 credits of coursework is required for a baccalaureate degree with a minimum 2.0 overall GPA, and a minimum 2.0 major GPA.

Code	Title	Credits
General Education Requirements		32
World Languages and Cultures Requirements		3-9
Major Requirements		75-78
Free Electives		10-1
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
BIOL 417	Evolutionary Biology	3
Major Electives		
Select two courses from the list (see below)		7
Environmental Science Concentration		
EAES 105	Physical Geology	4
Concentration Electives		
Select three courses from the list below.		9-12
Collateral Chemistry Courses		
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
Collateral Mathematics Courses		
Select two of the following options:		8
STAT 230 & STAT 231	Data Science and Statistics and Data Science and Biostatistics	
AMAT 120 or MATH 122	Applied Calculus A Calculus I	
AMAT 220 or MATH 221	Applied Calculus B Calculus II	
Collateral Physics Courses		
Select one of the following sequences:		8
PHYS 191 & PHYS 192	University Physics I and University Physics II	
PHYS 193 & PHYS 194	College Physics I and College Physics II	
Total Credits		**75-78**

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 250	Introduction to Marine Sciences	4
EAES 240	Earth System History	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

General Education Requirements

Click here for a list of courses that fulfill General Education categories. (http://catalog.montclair.edu/programs/general-education-requirements-ba-bs/)

Code	Title	Credits
A. New Student Seminar		
Complete a 1 credit New Student Seminar course.		1
C. Communication		
1. Writing		*3*
2. Literature		*3*
3. Communication		*3*
D. Fine and Performing Arts		
Complete a 3 credit Fine and Performing Arts course.		3
F. Humanities		
1. Great Works and Their Influences		*3*
2. Philosophical and Religious Perspectives		*3*
G. Computer Science		
Complete a 3 credit Computer Science course.		3
H. Mathematics		
Fulfilled by collateral Math courses in the major.		
I. Natural Science Laboratory		
BIOL 112	Principles of Biology: Introduction to the Cell (Fulfilled in the major.)	
J. Physical Education		
Complete a 3 credit Computer Science course.		1
K. Social Science		
1. American and European History		*3*
2. Global Cultural Perspectives		*3*
3. Social Science Perspectives		*3*
L. Interdisciplinary Studies		
CHEM 120	General Chemistry I (Fulfilled in the major.)	
Total Credits		**32**

World Languages and Cultures Requirements

Click here for a list of courses that fulfill World Languages and Cultures categories. (http://catalog.montclair.edu/programs/world-languages-and-cultures-requirements/)

Code	Title	Credits
World Languages		
Based on language placement exam, complete one or two sequential courses in the same language. **Requirement is automatically fulfilled by language major courses.**		3-6
World Cultures		

Requirement may be fulfilled by course selected in General Education - Social Science: Global Cultural Perspectives. Requirement may also be fulfilled by major coursework. See list of courses.	0-3
Total Credits	**3-9**

Recommended Roadmap to Degree Completion

This four-year plan is provided as an outline for students to follow in order to complete their degree requirements within four years. This plan is a recommendation and students should only use it in consultation with their academic advisor.

First Year

Fall	Credits	Spring	Credits
BIOL 112	4	BIOL 113	4
GENERAL EDUCATION: (C1) Writing	3	GENERAL EDUCATION: (C2) Literature	3
Math sequence course 1	4	Math sequence course 2	4
CHEM 120	4	CHEM 121	4
GNED 199	1		
	16		**15**

Second Year

Fall	Credits	Spring	Credits
BIOL 230	4	BIOL 213	4
CHEM 230	3	CHEM 231	3
CHEM 232	2	EAES 105	4
GENERAL EDUCATION: (C3) Communication	3	World Cultures	3
GENERAL EDUCATION (L) Interdisciplinary Studies	3	Free Elective	0-3
	15		**14-17**

Third Year

Fall	Credits	Spring	Credits
BIOL 380	4	Biology Major elective	3-4
PHYS 191 or 193	4	PHYS 192 or 194	4
GENERAL EDUCATION (F1) Humanities – Great Works and Their Influences	3	World Language 2	3
GENERAL EDUCATION (K3) Social Science – Social Science Perspectives	3	GENERAL EDUCATION (D) Fine and Performing Arts	3
World Language 1	3	GENERAL EDUCATION (K1) Social Science – American and European History	3
	17		**16-17**

Fourth Year

Fall	Credits	Spring	Credits
Biology Major elective	4	Environmental Science elective	3-4
Environmental Science elective	3-4	Environmental Science elective	3-4
CSIT 100	3	GENERAL EDUCATION (K2) Social Science – Global Cultural Perspectives	3
GENERAL EDUCATION (F2) Humanities – Philosophical and Religious Perspectives	3	BIOL 417	3
Free Elective	1-3	GENERAL EDUCATION (J) Physical Education	1
	14-17		**13-15**

Total Credits 120-129