

MARINE BIOLOGY AND COASTAL SCIENCES (B.S.)

Marine Biology and Coastal Sciences represent the wide variety of ecosystems that are linked through water. The study of Marine Biology and Coastal Sciences encompasses freshwater lakes and streams, estuaries, and coastal marine habitats. These habitats are critical for numerous plants and animals, but they can be compromised by human activities. Students who pursue this major are interested in understanding the relationships among plants, animals and humans and how to protect and restore these valuable ecosystems.

This major is an interdisciplinary program of study emphasizing the four core sciences of biology, geology, chemistry, and physics. Students completing this program will be well prepared to enter the work force in research, environmental consulting, education and regulatory agencies (e.g., EPA), as well as in non-profit organizations. Additionally, students will be prepared to undertake further graduate work.

The curriculum was designed for students who have had high school biology, chemistry, and physics, and three years of college preparatory mathematics.

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. Colette Feehan, Science Hall 132, feehanc@montclair.edu.

Degree Requirements Overview

Code	Title	Credits
	New Student Seminar	1
	SEEDS General Education Requirements	24-27
	Major Requirements	70-74
	Free Electives	25-18
	Total Credits	120

Major Requirements

Code	Title	Credits
	Major Requirements	
BIOL 351	Introduction to Aquatic Ecology	4
BIMS 220	Introduction to Marine Biology	4
BIOL 113	Principles of Biology: Organisms and Diversity	4
BIOL 213	Introduction to Ecology	4
EAES 105	Physical Geology	4
EAES 230	Hydrology	3
EAES 322	Environmental Geochemistry	3
	Select one of the following:	4

AQUA 495	Research in Aquatic and Coastal Sciences	
BIMS 490	Field Methods in the Marine Sciences	
BIOL 418	Biology Independent Research	
EAES 494	Independent Study in Geoscience	
Major Electives		
Select three courses from the list below. ²		8-12
Collateral Requirements		
<i>Chemistry Collateral</i>		
CHEM 120	General Chemistry I	4
CHEM 121	General Chemistry II	4
CHEM 230	Organic Chemistry I	3
CHEM 232	Experimental Organic Chemistry I	2
<i>Physics Collateral</i>		
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	
<i>Mathematics Collateral</i>		
Select two of the following sequences:		8
AMAT 120	Applied Calculus A or MATH 12: Calculus I	
AMAT 220	Applied Calculus B or MATH 22: Calculus II	
STAT 230 & STAT 231	Data Science and Statistics and Data Science and Biostatistics	
Total Credits		67-71

² Students in the combined Marine Biology and Coastal Science Major (B.S.)/Marine Biology and Coastal Science (M.S.) program take only 2 elective courses.

Major Electives

Code	Title	Credits
BIMS 490	Field Methods in the Marine Sciences	4
BIOL 300	Environmental Biology and Related Controversial Issues	3
BIOL 330	Introduction to Animal Behavior	3
BIOL 370	Principles of Ecology	3
BIOL 380	Genetics	4
BIOL 406	Scanning Electron Microscopy	4
BIOL 422	Community Ecology	3
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 482	Research Community I: 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 489	Special Topics in Organismal Biology	3-4
BIOL 495	Special Topics in Ecology	3
CHEM 231	Organic Chemistry II	3
CHEM 233	Experimental Organic Chemistry II	2
CHEM 310	Analytical Chemistry	4
EAES 210	Introduction to GIS and Remote Sensing	3
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 311	Fundamentals of Remote Sensing of Environment	3
EAES 320	Igneous Metamorphic Petrology	4
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

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 AMAT 120 or 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 113 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: Interactive Communication	3
SEEDS: Effective Writing I	3	SEEDS: Effective Writing II	3
AMAT 120 or MATH 122 (Fulfills SEEDS: Quantitative Reasoning)	4	EAES 105	4
BIOL 113 (Fulfills SEEDS: Exploration 1 - Scientific Reasoning)	4	BIOL 213	4
SEEDS: Political and Civic Life	3		

15

14

Second Year

Fall	Credits	Spring	Credits
EAES 320		4 BIMS 220	4
CHEM 120		4 CHEM 121	4
PHYS 193		4 PHYS 194	4
STAT 230		3 STAT 231	1
SEEDS: World Language 1		3 SEEDS: World Language 2 or Free Elective	3
	18		16

Third Year

Fall	Credits	Spring	Credits
SEEDS: Exploration 2		3 SEEDS: Exploration 3	3
CHEM 230		3 EAES 322	3
CHEM 232		2 Major Elective	3
BIOL 351		4 Major Elective	3
Free Elective		3	
	15		12

Fourth Year

Fall	Credits	Spring	Credits
SEEDS: Exploration 4		3 Major Elective	3
BIOL 418		4 Major Elective	4
Free Elective		3 Free Elective	3
Free Elective		3 Free Elective	3
Free Elective		3 Free Elective	1
	16		14

Total Credits 120