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

Program Requirements Overview

Code	Title	Credits
General Education Requirements		35
World Languages and Cultures Requirements		3-9
Major Requirements		70-74
Free Electives [1]		12-2
Total Credits		**120**

[1] Graduate Swing courses will count toward Free Electives for students in combined degree programs.

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		
Chemistry Collateral		
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
Physics Collateral		
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	
Mathematics Collateral		
Select two of the following sequences:		8
AMAT 120 or MATH 121	Applied Calculus A Calculus I	
AMAT 220 or MATH 221	Applied Calculus B 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

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 mathematics requirement in the major.		
I. Natural Science Laboratory		
BIOL 113	Principles of Biology: Organisms and Diversity (Fulfilled in the major.)	
J. Physical Education		
Complete a 1 credit Physical Education course.		1
K. Social Science		
1. American and European History		*3*
2. Global Cultural Perspectives		*3*
3. Social Science Perspectives		*3*
L. Interdisciplinary Studies		
Complete a 3 credit Interdisciplinary Studies course.		3
Total Credits		**35**

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**
GENERAL EDUCATION: (A) New Student Seminar	1	GENERAL EDUCATION: (C2) Literature	3
GENERAL EDUCATION: (C1) Writing	3	GENERAL EDUCATION: (C3) Communication	3
	4		**6**
Total Credits 10			