

BIOLOGY (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,
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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	3-6
	Major Requirements	72-75
	Free Electives	13-7
	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
Biology Major Electives		
	Complete four requirements (see list below)	17-20
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 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	
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	Applied Calculus A or MATH 122 Calculus I
AMAT 220	Applied Calculus B or MATH 221 Calculus II

Total Credits 72-75

Biology Major Electives

Complete the four requirements, including at least one 4-credit course (One course cannot be used in 2 areas)

Code	Title	Credits
Cell and Molecular		
Select one of the following:		
BIOL 319	Genes, Brains, and Behavior	4
BIOL 350	Microbiology	4
BIOL 410	Toxicology	3
BIOL 415	Population Genetics	3
BIOL 433	Developmental Biology	4
BIOL 434	Molecular Biology	3
BIOL 435	Experimental Molecular Biology	3
BIOL 444	Cell Physiology	3
BIOL 445	Immunology	3
BIOL 446	Endocrinology	3
BIOL 457	Virology	3
BIOL 458	Microbial Genetics	3
BIOL 468	Neurobiology	3
BIOL 475	Medical Genetics	3
BIOL 476	Biology of Cancer	3
BIOL 482	Research Community I: Molecular Biology	4
BIOL 483	Research Community II: Molecular Biology	4
BIOL 487	Statistical Genomics	3
BIOL 488	Special Topics in Cell and Molecular Biology	3-4
BIOL 493	Molecular Ecology	3
BIOL 497	Genomics	3
Ecology		
Select one of the following:		
BIMS 220	Introduction to Marine Biology	4
BIOL 300	Environmental Biology and Related Controversial Issues	3
BIOL 330	Introduction to Animal Behavior	3
BIOL 351	Introduction to Aquatic Ecology	4
BIOL 370	Principles of Ecology	3
BIOL 415	Population Genetics	3
BIOL 420	Economic Botany	3
BIOL 422	Community Ecology	3
BIOL 426	New Jersey Flora	4
BIOL 429	Herpetology	4
BIOL 430	Ornithology	4
BIOL 431	Entomology	3
BIOL 436	Phylogenetic Zoology	4
BIOL 451	Comparative Animal Physiology	3

BIOL 460	Biological Oceanography	3	BIOL 415	Population Genetics	3
BIOL 461	Aquatic Ecology	3	BIOL 418	Biology Independent Research	1-4
BIOL 484	Research Community I: Ecology	4	BIOL 420	Economic Botany	3
BIOL 485	Research Community II: Ecology	4	BIOL 422	Community Ecology	3
BIOL 493	Molecular Ecology	3	BIOL 425	Elementary Plant Physiology	3
BIOL 495	Special Topics in Ecology	3	BIOL 426	New Jersey Flora	4
Organismal					
Select one of the following:					
BIOL 319	Genes, Brains, and Behavior	4	BIOL 429	Herpetology	4
BIOL 320	Social Neurobiology	3	BIOL 430	Ornithology	4
BIOL 340	Advanced Human Anatomy and Physiology I	4	BIOL 431	Entomology	3
BIOL 341	Advanced Human Anatomy and Physiology II	4	BIOL 432	Medical Entomology	3
BIOL 410	Toxicology	3	BIOL 433	Developmental Biology	4
BIOL 425	Elementary Plant Physiology	3	BIOL 434	Molecular Biology	3
BIOL 432	Medical Entomology	3	BIOL 435	Experimental Molecular Biology	3
BIOL 433	Developmental Biology	4	BIOL 436	Phylogenetic Zoology	4
BIOL 439	Biology of Animal Parasites	3	BIOL 439	Biology of Animal Parasites	3
BIOL 440	Gross Mammalian Anatomy	4	BIOL 440	Gross Mammalian Anatomy	4
BIOL 441	Comparative Anatomy of Vertebrates	4	BIOL 441	Comparative Anatomy of Vertebrates	4
BIOL 442	Human Physiology	4	BIOL 442	Human Physiology	4
BIOL 443	Vertebrate Embryology	4	BIOL 443	Vertebrate Embryology	4
BIOL 445	Immunology	3	BIOL 444	Cell Physiology	3
BIOL 446	Endocrinology	3	BIOL 445	Immunology	3
BIOL 447	Fundamentals of Pharmacology	3	BIOL 446	Endocrinology	3
BIOL 450	Medical Microbiology	3	BIOL 447	Fundamentals of Pharmacology	3
BIOL 451	Comparative Animal Physiology	3	BIOL 450	Medical Microbiology	3
BIOL 457	Virology	3	BIOL 451	Comparative Animal Physiology	3
BIOL 468	Neurobiology	3	BIOL 457	Virology	3
BIOL 476	Biology of Cancer	3	BIOL 458	Microbial Genetics	3
BIOL 480	Research Community I: Organism Biology	4	BIOL 460	Biological Oceanography	3
BIOL 481	Research Community II: Organism Biology	4	BIOL 461	Aquatic Ecology	3
BIOL 489	Special Topics in Organismal Biology	3-4	BIOL 468	Neurobiology	3
Additional Elective					
Select two of the following:					
BIMS 220	Introduction to Marine Biology	4	BIOL 475	Medical Genetics	3
BIOL 300	Environmental Biology and Related Controversial Issues	3	BIOL 476	Biology of Cancer	3
BIOL 319	Genes, Brains, and Behavior	4	BIOL 480	Research Community I: Organism Biology	4
BIOL 320	Social Neurobiology	3	BIOL 481	Research Community II: Organism Biology	4
BIOL 330	Introduction to Animal Behavior	3	BIOL 482	Research Community I: Molecular Biology	4
BIOL 340	Advanced Human Anatomy and Physiology I	4	BIOL 483	Research Community II: Molecular Biology	4
BIOL 341	Advanced Human Anatomy and Physiology II	4	BIOL 484	Research Community I: Ecology	4
BIOL 350	Microbiology	4	BIOL 485	Research Community II: Ecology	4
BIOL 360	Introduction to Bio-Imaging	3	BIOL 486	Special Topics in Biology	3-4
BIOL 370	Principles of Ecology	3	BIOL 487	Statistical Genomics	3
BIOL 404	Plant and Animal Histological Techniques	3	BIOL 488	Special Topics in Cell and Molecular Biology	3-4
BIOL 405	Cell Culture	3	BIOL 489	Special Topics in Organismal Biology	3-4
BIOL 406	Scanning Electron Microscopy	4	BIOL 490	Senior Seminar in Biology	3
BIOL 409	Externship in Biological Research (Co-operative Education)	1-4	BIOL 491	Research in Biology Literature	1
BIOL 410	Toxicology	3	BIOL 492	Senior Colloquium	1
BIOL 411	Introduction to Transmission Electron Microscopy	4	BIOL 493	Molecular Ecology	3
			BIOL 495	Special Topics in Ecology	3
			BIOL 497	Genomics	3
			CHEM 370	Biochemistry I	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. <i>Writing</i>	3
	2. <i>Literature</i>	3
	3. <i>Communication</i>	3
D. Fine and Performing Arts		
	Complete a 3 credit Fine and Performing Arts course.	3
F. Humanities		
	1. <i>Great Works and Their Influences</i>	3
	2. <i>Philosophical and Religious Perspectives</i>	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 1 credit Physical Education course.	1
K. Social Science		
	1. <i>American and European History</i>	3
	2. <i>Global Cultural Perspectives</i>	3
	3. <i>Social Science Perspectives</i>	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		Credits	Spring	Credits
Fall	GENERAL EDUCATION: (A) New Student Seminar		GENERAL EDUCATION: (C2) Literature	3
	GENERAL EDUCATION: (C1) Writing	3	BIOL 113	4
	BIOL 112		4 CHEM 121	4
	CHEM 120		4 Collateral Math/Applied Math/Statistics course.	4
	Collateral Math/Applied Math/Statistics course	4		
		16		15
Second Year				
Fall	GENERAL EDUCATION: (C3) Communication		GENERAL EDUCATION: (G) Computer Science	3
	World Language 1	3	GENERAL EDUCATION: (K2) Social Science – Global Cultural Perspectives	3
	BIOL 230		4 World Language 2	3
	CHEM 230		3 BIOL 213	4
	CHEM 232		2 CHEM 231	3
		15		16
Third Year				
Fall	BIOL 380		4 GENERAL EDUCATION: (J) Physical Education	1
	PHYS 191 or 193		4 BIOL 417	3
	Cell/Molecular Elective	3-4	PHYS 192 or 193	4
	Ecology Elective	3-4	Organismal Elective	3-4
			Additional Major Elective	3-4
		14-16		14-16
Fourth Year				
Fall	GENERAL EDUCATION: (D) Fine and Performing Arts		GENERAL EDUCATION: (K3) Social Science – Social Science Perspectives	3
	GENERAL EDUCATION: (F1) Humanities – Great Works and Their Influences		3 Free Electives	11-7
	GENERAL EDUCATION: (F2) Humanities – Philosophical and Religious Perspectives	3		

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GENERAL EDUCATION: (K1) Social Science – American and European History	3	
Additional Major elective	4	
	16	14-10

Total Credits 120