

BIOLOGY WITH TEACHER CERTIFICATION IN BIOLOGICAL SCIENCE (PRESCHOOL-GRADE 12) (B.S.)

This program is intended to prepare students to be effective and knowledgeable Biology instructors at the High School level. Students who wish to pursue P-12 in Biological Science teacher certification must apply to and be admitted to the Teacher Education Program. Once admitted, students will be matriculated into the B.A. in Secondary Education (<http://catalog.montclair.edu/programs/secondary-education-p12-ba/>) program as a second major.

Please visit the Teacher Education Program website (<http://www.montclair.edu/cehs/academics/cop/>) for the required professional sequence of courses and other important Program requirements, guidelines, and procedures. Students are strongly advised to review the Teacher Education Program Handbook. The course SASE 402 Methods of Teaching Science in Secondary Schools is a requirement.

120 credits of coursework is required for the baccalaureate degree with a minimum 3.0 overall GPA. Minimum Major GPA of 2.75 is required. Consult the Teacher Education Handbook for more information.

Degree Requirements Overview

Code	Title	Credits
	New Student Seminar	1
	SEEDS General Education Requirements	18-21
	Major Requirements	69
	Second Major in Secondary Education (Subject Area P-12)	37
	Total Credits	125-128

Major Requirements

Code	Title	Credits
Core 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
Additional Biology Courses		
BIOL 417	Evolutionary Biology	3
<i>Elective Courses</i>		
	Select one course from each of the four areas below. Two 4-credit courses must be completed..	14
Collateral Chemistry Courses		
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
Collateral Mathematics Courses		

MATH 122	Calculus I	4
STAT 230	Data Science and Statistics	3
Collateral Physics Courses		
PHYS 193	College Physics I	4
PHYS 194	College Physics II	4
Collateral Earth Science Course		
	Select one of the following:	4
EAES 101	Planet Earth	
EAES 105	Physical Geology	
EAES 107	Earth and the Environment	
EAES 240	Earth System History	

Total Credits 69

Biology Teacher Ed Major Electives

Code	Title	Credits
Cell and Molecular		
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 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		
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 432	Medical Entomology	3
BIOL 436	Phylogenetic Zoology	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 493	Molecular Ecology	3
BIOL 495	Special Topics in Ecology	3-4
Organismal		
BIOL 320	Social Neurobiology	3
BIOL 340	Advanced Human Anatomy and Physiology I	4
BIOL 341	Advanced Human Anatomy and Physiology II	4
BIOL 405	Cell Culture	3
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 447	Fundamentals of Pharmacology	3
BIOL 450	Medical Microbiology	3
BIOL 489	Special Topics in Organismal Biology	3-4
Research		
BIOL 409	Externship in Biological Research (Co-operative Education)	1-4
BIOL 418	Biology Independent Research	1-4
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 483	Research Community II: Molecular Biology	4
BIOL 484	Research Community I: Ecology	4
BIOL 485	Research Community II: Ecology	4
BIOL 491	Research in Biology Literature	1

Co-Major in Secondary Education

Secondary Education (B.A.) (<http://catalog.montclair.edu/programs/secondary-education-p12-ba/>)

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 MATH 122 in the major.		
<i>Political and Civic Life</i>		
Fulfilled by SASE 210 in the Education major.		
<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:		6
<i>Analyzing Cultures and Societies</i>		
<i>Creative Expression</i>		
<i>Ethical Inquiry</i>		
Fulfilled by EDFD 200 in the Education major.		
<i>Historical Thinking</i>		
<i>Literary and Artistic Analysis</i>		
<i>Scientific Reasoning</i>		
Fulfilled by BIOL 112 in the major.		
Total Credits		18-21

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
BIOL 112 (Fulfills SEEDS: Exploration 1 - Scientific Reasoning)	4	BIOL 113	4
SEEDS: Effective Writing I	3	SEEDS: Effective Writing II	3
MATH 122 (Fulfills SEEDS: Quantitative Reasoning)	4	STAT 230	3

CHEM 120	4	CHEM 121	4
New Student Seminar	1		
	16		14

Second Year

Fall	Credits	Spring	Credits
BIOL 213	4	BIOL 230	4
PHYS 193	4	PHYS 194	4
Earth Science Collateral	4	SASE 210 (Fulfills SEEDS: Political and Civic Life)	3
SEEDS: World Language 1	3	EDFD 200 (Fulfills SEEDS: Exploration 2 - Ethical Inquiry)	3
		SEEDS: World Language 2 or Free Elective	3
	15		17

Third Year

Fall	Credits	Spring	Credits
Major Elective (Ecology)	3	CHEM 230	3
SASE 320	3	Biology Major elective (Cell & Molecular)	3
SASE 321	3	Biology Major elective (Organismal)	3
BIOL 380	4	BIOL 417	3
SEEDS: Interactive Communication	3	SASE 322	3
	16		15

Fourth Year

Fall	Credits	Spring	Credits
SEEDS: Exploration 3	3	SASE 452	3
SASE 402	4	SASE 453	9
SASE 450	3		
SASE 451	3		
Free Elective	2		
	15		12

Total Credits 120