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

Students who wish to pursue P-12 in Biological Science teacher certification must apply to and be admitted to the Teacher Education Program. 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.

Program Requirements Overview

Code	Title	Credits
General Education Requirements		13
Major Requirements		70
Teacher Education Program Requirements		37
Total Credits		**120**

Major Requirements

Code	Title	Credits
Required Biology Courses		
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
Required Biology Electives		
Select one course from each of the four areas below.		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 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 or MATH 121	Applied Calculus A Calculus I	
AMAT 220 or MATH 221	Applied Calculus B Calculus II	
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		**70**

Biology Teacher Ed Major Electives

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

BIOL 451	Comparative Animal Physiology
BIOL 460	Biological Oceanography
BIOL 461	Aquatic Ecology
BIOL 484	Research Community I: Ecology
BIOL 485	Research Community II: Ecology
BIOL 493	Molecular Ecology
Organismal	
Select one of the following:	3-4
BIOL 410	Toxicology
BIOL 425	Elementary Plant Physiology
BIOL 432	Medical Entomology
BIOL 433	Developmental Biology
BIOL 439	Biology of Animal Parasites
BIOL 440	Gross Mammalian Anatomy
BIOL 441	Comparative Anatomy of Vertebrates
BIOL 442	Human Physiology
BIOL 443	Vertebrate Embryology
BIOL 445	Immunology
BIOL 446	Endocrinology
BIOL 447	Fundamentals of Pharmacology
BIOL 450	Medical Microbiology
BIOL 451	Comparative Animal Physiology
BIOL 457	Virology
BIOL 468	Neurobiology
BIOL 476	Biology of Cancer
BIOL 480	Research Community I: Organism Biology
BIOL 481	Research Community II: Organism Biology
BIOL 489	Special Topics in Organismal Biology
Research	
Select one of the following:	3-4
BIOL 409	Externship in Biological Research (Co-operative Education)
BIOL 418	Biology Independent Research
BIOL 480	Research Community I: Organism Biology
BIOL 481	Research Community II: Organism Biology
BIOL 482	Research Community I: Molecular Biology
BIOL 483	Research Community II: Molecular Biology
BIOL 484	Research Community I: Ecology
BIOL 485	Research Community II: Ecology
Total Credits	**12-16**

Teacher Education Program Requirements

Teacher Education Program Requirements (Teacher Certification in Subject Area P-12) (http://catalog.montclair.edu/programs/teacher-education-program-requirements-p12/)

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*
F. Humanities		
2. Philosophical and Religious Perspectives		*3*
H. Mathematics		
Fulfilled by mathematics collateral courses in the major.		
I. Natural Science Laboratory		
CHEM 120	General Chemistry I (Fulfilled in the major.)	
K. Social Science		
1. American and European History		*3*
3. Social Science Perspectives		
Fulfilled in the Teacher Education sequence.		
EDFD 200	Psychological Foundations of Education	
or PSYC 200	Educational Psychology	
L. Interdisciplinary Studies		
SASE 210	Public Purposes of Education: Democracy and Schooling (Fulfilled in the Teacher Education sequence.)	
Total Credits		**13**

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
WRIT 105	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	EDFD 200	3
CHEM 232	2	GENERAL EDUCATION (K1) Social Science – American and European History	3
SASE 210	3	BIOL 380	4
GENERAL EDUCATION (F2) Humanities – Philosophical and Religious Perspectives	3		
	15		**14**

Third Year

Fall	Credits	Spring	Credits
Earth Science Collateral 1	4	Biology Major elective (Cell & Molecular)	3-4
Earth Science Collateral 2	4	Biology Major elective (Organismal)	3-4
PHYS 191 or 193	4	Biology Major elective (Ecology)	3-4
SASE 320	3	PHYS 192 or 194	4
		SASE 322	3
	15		**16-19**

Fourth Year

Fall	Credits	Spring	Credits
BIOL 417	3	SASE 452	3
Biology Major elective (Research)	4	SASE 453	9
SASE 450	3		
SASE 451	3		
SASE 402	4		
	17		**12**

Total Credits 120-123