

BIOLOGY (B.S.)(COMBINED B.S./M.A.T. TEACHING WITH TEACHER CERTIFICATION IN BIOLOGICAL SCIENCE (PRESCHOOL-GRADE 12) AND TEACHER OF STUDENTS WITH DISABILITIES)

A Combined Degree program enables undergraduate students to enroll in graduate courses in their senior year, which can be counted towards the completion of both their Bachelor's and Master's degree requirements.

The ability to take these "swing courses" allows students to earn both their Bachelor's and Master's degrees in a shortened period of time, typically within five years of intensive study. Undergraduate students interested in this option can find more information regarding program requirements on the University's Combined Programs website (<https://www.montclair.edu/combined-programs/programs-of-study/>).

The Combined Degree with Dual Certification program is a 5-year program that leads to teacher certification in Biological Science (grades P-12), teacher certification in Teacher of Students with Disabilities, a baccalaureate degree and a master's degree. Interested students must apply to and be admitted to the Teacher Education Program as an undergraduate.

Students must successfully complete the undergraduate portion of the program in order to be admitted to the Graduate School and complete the one-year master's portion of the program. Please visit the Teacher Education Program (<http://www.montclair.edu/cehs/academics/cop/teacher/>) website for the required undergraduate professional sequence of courses, overall course outline, and other important Program requirements, guidelines, and procedures. Students also are strongly advised to review the Teacher Education Program Handbook.

Certain pre-qualified students may be accepted into the major; others will need to complete the following:

3.00 overall GPA required

Please note: The Biology and Molecular Biology majors have retention policies. By the end of their second semester in the major (i.e. spring), students must maintain a minimum 2.00 GPA and have completed the following courses: BIOL 112 and/or BIOL 113, CHEM 106 and/or CHEM 120, and MATH 111. These criteria do not apply to students entering in the Fall in the <https://www.montclair.edu/university-college/stem-pioneers/> STEM Pioneers Program

Successfully complete one semester of a math, biology and chemistry course in the major with a C- or higher

Departmental advising meeting required.

Contact: Dr. Dirk Vanderklein, Science Hall, Room 116, 973-655-5265

120 credits of coursework is required for the baccalaureate degree with a minimum 3.0 overall GPA. Major GPA requirements differ depending on

field of study. Consult the Teacher Education Program Handbook for more information.

Program Requirements Overview

Code	Title	Credits
	General Education Requirements	13
	Major Requirements	70
	Teacher Education Program Requirements	36
	Free Electives	1
Total Credits		120

Major Requirements

Requirements for the graduate portion of this combined program can be found here. (<http://catalog.montclair.edu/programs/teaching-certification-p12-students-disabilities-combined-bx-mat/>)

Code	Title	Credits
Required Biology Courses		
BIOL 112	Principles of Biology I	4
BIOL 113	Principles of Biology II	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	Applied Calculus A or MATH 12: Calculus I	
AMAT 220	Applied Calculus B or MATH 221: 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 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:		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
AQUA 351	Aquatic Biological Processes	
BIMS 220	Introduction to Marine Biology	
BIOL 300	Environmental Biology and Related Controversial Issues	
BIOL 330	Introduction to Animal Behavior	
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 14

Teacher Education Program Requirements

Teacher Education Program Requirements for Combined Degree Programs with Subject Area P-12 and Teacher of Students with Disabilities Certifications (<http://catalog.montclair.edu/programs/combined-bx-mat-teacher-education-program-requirements-p12-td/>)

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(s)

This recommended five-year plan is provided as an outline for students to follow in order to complete their degree requirements within five years. This plan is a recommendation and students should only use it in consultation with their academic advisor.

Fifth year courses are taken at the graduate level, after matriculation into the graduate portion of this combined degree program.

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

Third Year

Fall	Credits	Spring	Credits
SASE 320		3 SASE 322	3
SASE 321	3	SPED 469	3
SPED 279	3		
	9		6

Fourth Year

Fall	Credits	Spring	Credits
SPED 483		3 SPED 566	3
SPED 488	3	SPED 586	3
		SPED 690	3
	6		9

Total Credits 40

Fifth Year

Fall	Credits	Spring	Credits
SASE 526		3 SASE 529	6
SASE 527	3	SASE 543	3
SPED 584	3		
Teaching Methods Course	3-4		
	12-13		9

Total Credits 21-22