

# 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. 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.

## Degree Requirements Overview

Code	Title	Credits
	New Student Seminar	1
	SEEDS General Education Requirements	18-21
	Major Requirements	70
	Teacher Education Program Requirements	36
<b>Total Credits</b>		<b>125-128</b>

## 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
<b>Required Biology Courses</b>		
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
<b>Required Biology Electives</b>		
Select one course from each of the four areas below.		14
<b>Collateral Chemistry Courses</b>		
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
<b>Collateral Physics Courses</b>		
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	
<b>Collateral Mathematics Courses</b>		
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	
<b>Collateral Earth Science Course</b>		
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	
<b>Total Credits</b>		<b>70</b>

## 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
<b>Cell and Molecular</b>		
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	
<b>Ecology</b>		
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	
<b>Organismal</b>		
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	
<b>Research</b>		
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/>)

## 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
<b>Foundations</b>		
<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 Teacher Education requirements.	
<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
<b>Exploration</b>		
	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 Teacher Education requirements.	
<i>Historical Thinking</i>		
<i>Literary and Artistic Analysis</i>		
<i>Scientific Reasoning</i>		
	Fulfilled by BIOL 112 in the major.	
<b>Total Credits</b>		<b>18-21</b>