PHYSICS (B.S.)

For information about the B.S. in Physics, M.S. in Mechanical Engineering (an external, 5-year dual degree program with Stevens Institute of Technology), click here (https://www.montclair.edu/physics-astronomy/2020/09/15/partnership-with-stevens-yields-new-32-program/).

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.

Degree Requirements Overview

Code	Title	Credits
New Student Seminar		1
SEEDS General Education Requirements		24-27
Major Requirements		71-75
Free Electives [1]		24-17
Total Credits		**120**

[1] Graduate Swing Courses will count toward free electives for students in combined (UG/GR) programs.

Major Requirements

Code	Title	Credits
Physics Required Courses		
PHYS 191	University Physics I	4
PHYS 192	University Physics II	4
PHYS 198	Introductory Physics Seminar	1
PHYS 210	Intermediate Mechanics	3
PHYS 220	Oscillations, Waves, and Optics	3
PHYS 230	Intermediate Physics Laboratory	4
PHYS 300	Junior/Senior Physics Seminar	1
PHYS 320	Statistical and Thermal Physics	3
PHYS 330	Advanced Physics Laboratory	4
PHYS 340	Electricity and Magnetism	3
PHYS 360	Modern Physics	3
PHYS 464	Quantum Mechanics	3
Physics Elective Courses		
Select 9-12 credits from the list below.		9-12
Physics Collateral Courses		
CHEM 120	General Chemistry I	4
CHEM 121	General Chemistry II	4
CSIT 104	Python Programming I	3
MATH 122	Calculus I	4
or AMAT 120	Applied Calculus A	
MATH 221	Calculus II	4
or AMAT 220	Applied Calculus B	
MATH 222	Calculus III	4
AMAT 350	Applied Mathematics I	3-4
or MATH 325	Ordinary Differential Equation	
or PHYS 377	Mathematical Physics	
Total Credits		**71-75**

Major Electives

Code	Title	Credits
PHYS 180	Astronomy for Everyone	4
PHYS 245	Fundamentals of Electronics	4
PHYS 280	Astronomy for Physicists	4
PHYS 310	Advanced Mechanics	3
PHYS 325	Computational Physics	3
PHYS 341	Electronics and Digital Circuits	4
PHYS 350	Modern Optics	4
PHYS 368	Fluid Mechanics	3
PHYS 377	Mathematical Physics	3
PHYS 380	Observational Astronomy	4
PHYS 399	Special Topics in Physics	1-4
PHYS 451	Radiation and Medical Physics	3
PHYS 461	General Relativity	3
PHYS 462	Nuclear Physics	4
PHYS 470	Solid State Physics	3
PHYS 480	Astrophysics	3
PHYS 495	Research or Independent Study in Physics	1-4

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		
Effective Writing I		
Complete one Effective Writing I course.		3
Effective Writing II		
Complete one Effective Writing II course.		3

Interactive Communication	
Complete one Interactive Communication course.	3
Quantitative Reasoning	
Fulfilled by AMAT 120 or MATH 122 in the major.	
Political and Civic Life	
Complete one Political and Civic Life course.	3
World Language	
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:	9
Analyzing Cultures and Societies	
Creative Expression	
Ethical Inquiry	
Historical Thinking	
Literary and Artistic Analysis	
Scientific Reasoning	
Fulfilled by PHYS 191 in the major.	
Total Credits	**24-27**

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
New Student Seminar	1	PHYS 198	1
SEEDS: Effective Writing I	3	SEEDS: Effective Writing II	3
AMAT 120 or MATH 122 (Fulfills SEEDS: Quantitative Reasoning)	4	AMAT 220 or MATH 221	4
PHYS 191 (Fulfills SEEDS: Exploration 1 - Scientific Reasoning)	4	PHYS 192	4
CSIT 104	3	Major Elective	4
	15		**16**

Second Year

Fall	Credits	Spring	Credits
MATH 222	4	AMAT 350, MATH 325, or PHYS 377	3
PHYS 210	3	PHYS 320	3
PHYS 230	4	PHYS 340	3
SEEDS: World Language 1	3	SEEDS: Interactive Communication	3
		SEEDS: World Language 2 or Free Elective	3
	14		**15**

Third Year

Fall	Credits	Spring	Credits
SEEDS: Exploration 2	3	SEEDS: Exploration 3	3
PHYS 220	3	PHYS 360	3
CHEM 120	4	CHEM 121	4
Free Elective	3	Physics Elective	3
Free Elective	3		
	16		**13**

Fourth Year

Fall	Credits	Spring	Credits
PHYS 300	1	PHYS 330	4
PHYS 464	3	Physics Elective	3
SEEDS: Political and Civic Life	3	SEEDS: Exploration 4	3
Free Elective	3	Free Elective	3
Free Elective	3	Free Elective	2
Free Elective	3		
	16		**15**

Total Credits 120