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 the baccalaureate degree with a minimum 2.0 overall GPA, and a minimum 2.0 major GPA.

Program Requirements Overview

Code	Title	Credits
General Education Requirements		32
World Languages and Cultures Requirements		3-6
Major Requirements		71-75
Free Electives [1]		14-7
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

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*
3. Communication		*3*
D. Fine and Performing Arts		
Complete a 3 credit Fine and Performing Arts course.		3
F. Humanities		
1. Great Works and Their Influences		*3*
2. Philosophical and Religious Perspectives		*3*
G. Computer Science		
CSIT 104	Python Programming I (Fulfilled in the major.)	
H. Mathematics		
Fulfilled in the major.		
AMAT 120	Applied Calculus A	
or MATH 12	Calculus I	
I. Natural Science Laboratory		
PHYS 191	University Physics I (Fulfilled in the major.)	
J. Physical Education		
Complete a 1 credit Physical Education course.		1
K. Social Science		
1. American and European History		*3*
2. Global Cultural Perspectives		*3*

Course selected must also satisfy the World Cultures requirement.	
3. Social Science Perspectives	*3*
L. Interdisciplinary Studies	
Complete a 3 credit Interdisciplinary Studies course.	3
Total Credits	**32**

World Languages and Cultures Requirements

Click here for a list of courses that fulfill World Languages and Cultures categories. (http://catalog.montclair.edu/programs/world-languages-and-cultures-requirements/)

Code	Title	Credits
World Languages		
Based on language placement exam, complete one or two sequential courses in the same language. **Requirement is automatically fulfilled by language major courses.**		3-6
World Cultures		
Requirement may be fulfilled by course selected in General Education - Social Science: Global Cultural Perspectives. Requirement may also be fulfilled by major coursework. See list of courses.		0-3
Total Credits		**3-9**

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
GENERAL EDUCATION: (A) New Student Seminar	1	GENERAL EDUCATION: (C2) Literature	3
GENERAL EDUCATION: (C1) Writing	3	GENERAL EDUCATION: (C3) Communication	3
AMAT 120 or MATH 122	4	AMAT 220 or MATH 221	4
CSIT 104	3	PHYS 192	4
PHYS 191	4	PHYS 198	1
	15		**15**

Second Year

Fall	Credits	Spring	Credits
GENERAL EDUCATION: (K3) Social Science – Social Science Perspectives	3	AMAT 350, MATH 325, or PHYS 377	3
GENERAL EDUCATION: (L) Interdisciplinary Studies	3	CHEM 121	4
CHEM 120	4	PHYS 320	3
MATH 222	4	PHYS 340	3
PHYS 210	3		
	17		**13**

Third Year

Fall	Credits	Spring	Credits
GENERAL EDUCATION: (D) Fine and Performing Arts	3	GENERAL EDUCATION: (F1) Humanities – Great Works and Their Influences	3
World Language 1	3	GENERAL EDUCATION: (F2) Humanities – Philosophical and Religious Perspectives	3
PHYS 220	3	World Language 2	3
PHYS 230	4	PHYS 360	3
PHYS 300	1	Physics Elective	3-4
	14		**15-16**

Fourth Year

Fall	Credits	Spring	Credits
GENERAL EDUCATION: (K1) Social Science – American and European History	3	GENERAL EDUCATION: (J) Physical Education	1
GENERAL EDUCATION: (K2) Social Science – Global Cultural Perspectives	3	Physics Elective	3-4
PHYS 330	4	Free Electives	11-8
PHYS 464	3		
Physics Elective	3-4		
	16-17		**15-13**

Total Credits 120