

PHYSICS MAJOR (B.S.)

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/undergraduate-graduate-degree-requirements/general-ed-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 122: 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/undergraduate-graduate-degree-requirements/world-languages-cultures-requirement/>)

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

Recommended Roadmap to Degree Completion

This recommended 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.

Course	Title	Credits
First Year		
Fall		
GENERAL EDUCATION: (A) New Student Seminar		1
GENERAL EDUCATION: (C1) Writing		3
AMAT 120 or MATH 122	Applied Calculus A or Calculus I	4
CSIT 104	Python Programmin I	3
PHYS 191	University Physics I	4
Credits		15
Spring		
GENERAL EDUCATION: (C2) Literature		3
GENERAL EDUCATION: (C3) Communication		3
AMAT 220 or MATH 221	Applied Calculus B or Calculus II	4
PHYS 192	University Physics II	4
PHYS 198	Introductory Physics Seminar	1
Credits		15
Second Year		
Fall		
GENERAL EDUCATION: (K3) Social Science – Social Science Perspectives		3
GENERAL EDUCATION: (L) Interdisciplinary Studies		3
CHEM 120	General Chemistry I	4
MATH 222	Calculus III	4

PHYS 210	Intermediate Mechanics	3
Credits		17
Spring		
AMAT 350 or MATH 325 or PHYS 377	Applied Mathematics I or Ordinary Differential Equation or Mathematical Physics	3
CHEM 121	General Chemistry II	4
PHYS 320	Statistical and Thermal Physics	3
PHYS 340	Electricity and Magnetism	3
Credits		13
Third Year		
Fall		
GENERAL EDUCATION: (D) Fine and Performing Arts		3
World Language 1		3
PHYS 220	Oscillations, Waves, and Optics	3
PHYS 230	Intermediate Physics Laboratory	4
PHYS 300	Junior/ Senior Physics Seminar	1
Credits		14
Spring		
GENERAL EDUCATION: (F1) Humanities – Great Works and Their Influences		3
GENERAL EDUCATION: (F2) Humanities – Philosophical and Religious Perspectives		3
World Language 2		3
PHYS 360	Modern Physics	3
Physics Elective		3-4
Credits		15-16
Fourth Year		
Fall		
GENERAL EDUCATION: (K1) Social Science – American and European History		3
GENERAL EDUCATION: (K2) Social Science – Global Cultural Perspectives		3
PHYS 330	Advanced Physics Laboratory	4
PHYS 464	Quantum Mechanics	3
Physics Elective		3-4
Credits		16-17
Spring		
GENERAL EDUCATION: (J) Physical Education		1
Physics Elective		3-4
Free Electives		11-8
Credits		15-13
Total Credits		120