PHYSICS - ASTRONOMY CONCENTRATION (B.S.)

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.

Program Requirements Overview

Code	Title	Credits
General Education Requirements		32
World Languages and Cultures Requirements		3-6
Major Requirements		78-82
Free Electives		7-0
Total Credits		**120**

Major Requirements

Code	Title	Credits
Physics/Astronomy 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/Astronomy Concentration Courses		
Complete 10-11 credits from the following:		10-11
PHYS 280	Astronomy for Physicists	
PHYS 380	Observational Astronomy	
PHYS 461	General Relativity	
PHYS 480	Astrophysics	
Complete 6-8 credits from the following:		6-8
PHYS 245	Fundamentals of Electronics	
PHYS 310	Advanced Mechanics	
PHYS 325	Computational Physics	
PHYS 341	Electronics and Digital Circuits	
PHYS 350	Modern Optics	
PHYS 368	Fluid Mechanics	
PHYS 377	Mathematical Physics	
PHYS 399	Special Topics in Physics	
PHYS 462	Nuclear Physics	
PHYS 470	Solid State Physics	
PHYS 495	Research or Independent Study in Physics	
AMAT 345	Applied Probability	
AMAT 450	Applied Mathematics II	
MATH 460	Introduction to Applied Mathematics	
STAT 230	Data Science and Statistics	
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		**78-82**

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 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/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
CHEM 120	4	AMAT 350, MATH 325, or PHYS 377	3
MATH 222	4	CHEM 121	4
PHYS 210	3	PHYS 320	3
PHYS 280	4	PHYS 340	3
	15		**13**

Third Year

Fall	Credits	Spring	Credits
World Language 1	3	GENERAL EDUCATION: (F1) Humanities – Great Works and Their Influences	3
PHYS 220	3	GENERAL EDUCATION: (F2) Humanities – Philosophical and Religious Perspectives	3
PHYS 230	4	World Language 2	3
PHYS 300	1	PHYS 360	3
PHYS 461	3	Physics Elective	3-4
	14		**15-16**

Fourth Year

Fall	Credits	Spring	Credits
GENERAL EDUCATION: (D) Fine and Performing Arts	3	GENERAL EDUCATION: (J) Physical Education	1
GENERAL EDUCATION: (K3) Social Science – Social Science Perspectives	3	GENERAL EDUCATION: (K1) Social Science – American and European History	3
PHYS 330	4	GENERAL EDUCATION: (K2) Social Science – Global Cultural Perspectives	3
PHYS 464	3	GENERAL EDUCATION: (L) Interdisciplinary Studies	3
PHYS 480	3	Physics Elective	3-4
		Free Elective	4-2
	16		**17-16**

Total Credits 120