PHYSICS B.A. - ASTRONOMY

The astronomy concentration provides a thorough study of astronomy and astrophysics as well as a solid background in physics and mathematics. Graduates from this program have gone on to graduate programs in astronomy and astrophysics while others have found career opportunities at national astronomical observatories.

General Degree Requirements

To earn a baccalaureate degree, all students must complete successfully, in addition to any other requirements, the University of Montana General Education Requirements. Please refer to the General Education Requirements page (https://catalog.umt.edu/academics/general-education-requirements/) for more information.

Additional requirements for graduation can be found on the Degree/Certificate Requirements for Graduation page (https://catalog.umt.edu/academics/graduation-requirements/).

Unless otherwise noted in individual program requirements, a minimum grade point average of 2.00 in all work attempted at the University of Montana-Missoula is required for graduation. Please see the Academic Policies and Procedures page (https://catalog.umt.edu/academics/policies-procedures/) for information on how your GPA is calculated.

Courses taken to satisfy the requirements of a major, minor, or certificate program must be completed with a grade of C- or better unless a higher grade is noted in the program requirements.

BACHELOR OF ARTS - PHYSICS; ASTRONOMY CONCENTRATION

Course Requirements

Code	Title	Hours
Lower-Division Physics		
Complete one of the following Physics sequences:		10
Algebra- and Trigonometry-based Physics:		
PHSX 205N & PHSX 206N	College Physics I and College Physics I Laboratory	
PHSX 207N & PHSX 208N	College Physics II and College Physics II Laboratory	
Calculus-based Physics (strongly recommended):		
PHSX 215N & PHSX 216N	Fundamentals of Physics with Calculus I and Physics Laboratory I with Calculus	
PHSX 217N & PHSX 218N	Fundamentals of Physics with Calculus II and Physics Laboratory II with Calculus	
Lower-Division Astronomy Core		
Complete one of the following courses:		4
ASTR 132N & ASTR 135N	Stars, Galaxies, and the Universe and Stars, Galaxies, and the Universe Lab	
ASTR 142N	The Evolving Universe	
Upper-Division Physics		
Complete all of the following courses:		
PHSX 301	Intro Theoretical Physics	3
PHSX 311	Oscillations and Waves	2
PHSX 343	Modern Physics	3
PHSX 461	Quantum Mechanics I	3
PHSX 499	Senior Capstone Seminar	1
Upper-Division Astronomy Core [1]		
Complete all of the following courses:		
ASTR 353	Galaxies and Cosmology	3
ASTR 363	Stellar Astronomy & Astrophysics I	3
ASTR 365	Stellar Ast & Astrophys II	3
Physics Electives [1]		
Complete three of the following courses:		9
ASTR 351	Planetary and Exoplanet Science	
PHSX 320	Classical Mechanics	
PHSX 327	Optics	
PHSX 333	Computational Physics	
PHSX 423	Electricity & Magnetism I	
PHSX 425	Electricity & Magnetism II	
PHSX 446	Thermodynamics & Statistical Mechanics	
PHSX 451	Elementary Particle Physics	
PHSX 462	Quantum Mechanics II	
PHSX 491	Special Topics	
Physics Laboratory Elective		
Complete one of the following laboratory courses:		3
ASTR 362	Observational Astronomy	
PHSX 323	Intermediate Physics Lab	
PHSX 444	Advanced Physics Lab	
Math Requirements [2]		
Complete all of the following courses:		
M 171	Calculus I	4
M 172	Calculus II	4
M 221	Introduction to Linear Algebra	4
M 273	Multivariable Calculus	4
Computer Science Requirements		
Complete one of the following courses:		3
CSCI 150	Introduction to Computer Science	
CSCI 151	Interdisciplinary Computer Science I	
PHSX 333	Computational Physics	
Advanced Writing Requirement [3]		
Complete the following course:		
PHSX 330	Communicating Physics	3
Total Hours		**69**

1. In addition, ASTR 351 and ASTR 362 are recommended.
2. M 412 and M 418 are also recommended.
3. Students may substitute another advanced writing course with the approval of the department chair.

Four Year Plan

Course	Title	Hours
Freshman		
Autumn		
PHSX 215N & PHSX 216N	Fundamentals of Physics with Calculus I and Physics Laboratory I with Calculus	5
M 171	Calculus I	4
PHSX 101	The Physics Experience	1
CSCI 150	Introduction to Computer Science	3
HUSC 194	Seminar/Workshop	1

Elective		2
	Hours	**16**
Spring		
PHSX 217N & PHSX 218N	Fundamentals of Physics with Calculus II and Physics Laboratory II with Calculus	5
M 172	Calculus II	4
ASTR 142N	The Evolving Universe	4
WRIT 101	College Writing I	4
	Hours	**17**
Sophomore		
Autumn		
PHSX 311	Oscillations and Waves	2
PHSX 343	Modern Physics	3
M 273	Multivariable Calculus	4
CSCI 151	Interdisciplinary Computer Science I	3
	Hours	**12**
Spring		
PHSX 301	Intro to Theoretical Physics	3
M 221	Introduction to Linear Algebra	4
Astronomy Major Elective		3
Elective		3
	Hours	**13**
Junior		
Autumn		
ASTR 362	Observational Astronomy	3
ASTR 351	Planetary and Exoplanet Science	3
PHSX 461	Quantum Mechanics I	3
General Education Requirement		6
	Hours	**15**
Spring		
ASTR 353	Galaxies and Cosmology	3
PHSX 330	Communicating Physics	3
PHSX 462	Quantum Mechanics II	3
General Education Requirement		6
	Hours	**15**
Senior		
Autumn		
ASTR 363	Stellar Astronomy & Astrophysics I	3
PHSX 499	Senior Capstone Seminar	1
PHSX 423	Electricity & Magnetism I	3
General Education Requirement		3
Elective		5
	Hours	**15**
Spring		
Astronomy Major Elective		6
General Education Requirement		3
Elective		7
	Hours	**16**
	Total Hours	**119**

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