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.

Bachelor of Arts - Physics; Astronomy Concentration

General Education Requirements

Information regarding these requirements can be found in the General Education Section (http://catalog.umt.edu/academics/general-education-requirements/) of the catalog.

Summary

Code	Title	Hours
Lower-Division Physics Core		10
Lower-Division Astronomy Core		4
Upper-Division Physics Core		12
Upper-Division Astronomy Core		9
Major Electives		12
Physics Electives		
Physics Laboratory Electives		
Math Requirements		16
Computer Science Electives		3
Advanced College Writing Requirement		3
Total Hours		**69**

Degree Specific Credits: 69

Required Cumulative GPA: 2.0

Lower-Division Physics Core

Code	Title	Hours
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	
Total Hours		**10**

Minimum Required Grade: C-

Lower-Division Astronomy Core

Rule: Complete all of the courses in one of the two options. 4 total credits required.

Astronomy Core: Option 1

Code	Title	Hours
If option 1 is chosen, complete all of the following courses:		
ASTR 132N	Stars, Galaxies, and the Universe	3
ASTR 135N	Stars, Galaxies, and the Universe Lab	1
Total Hours		**4**

Minimum Required Grade: C-

Astronomy Core: Option 2

Code	Title	Hours
If option 2 is chosen, complete the following course:		
ASTR 142N	The Evolving Universe	4
Total Hours		**4**

Minimum Required Grade: C-

Upper-Division Physics Core

Code	Title	Hours
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
Total Hours		**12**

Minimum Required Grade: C-

Upper-Division Astronomy Core

Note: In addition, ASTR 351 and ASTR 362 are recommended.

Code	Title	Hours
Complete all of the following courses:		
ASTR 353	Galactic Astrophysics	3
ASTR 363	Stellar Astronomy & Astrophysics I	3
ASTR 365	Stellar Ast & Astrophys II	3
Total Hours		**9**

Minimum Required Grade: C-

Major Electives

Rule: Complete the following subcategories of courses. 12 total credits required.

Physics Electives

Code	Title	Hours
Complete three of the following courses:		**9**
ASTR 351	Planetary 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	
Total Hours		**9**

Minimum Required Grade: C-

Physics Laboratory Electives

Code	Title	Hours
Complete one of the following laboratory courses:		**3**
ASTR 362	Observational Astronomy	
PHSX 323	Intermediate Physics Lab	
PHSX 444	Advanced Physics Lab	
Total Hours		**3**

Minimum Required Grade: C-

Math Requirements

Note: In addition,M 412, and M 418 are recommended.

Code	Title	Hours
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
Total Hours		**16**

Minimum Required Grade: C-

Computer Science Electives

Code	Title	Hours
Select one of the following courses:		**3**
CSCI 150	Introduction to Computer Science	
CSCI 151	Interdisciplinary Computer Science I	
PHSX 333	Computational Physics (strongly recommended)	
Total Hours		**3**

Minimum Required Grade: C-

Advanced College Writing Requirement

Note: May substitute another advanced writing course as approved by the department chair.

Code	Title	Hours
Complete the following course:		
PHSX 330	Communicating Physics	3
Total Hours		**3**

Minimum Required Grade: C-