PHYSICS B.A. - COMPUTATIONAL PHYSICS

The computational physics concentration provides a thorough study of computer science and computational physics as well as a solid background in physics and mathematics. Graduates from this program have gone on to graduate programs in physics and computer science while others have found career opportunities in technical fields.

Bachelor of Arts - Physics; Computational Physics Concentration

College of Humanities & Sciences

Degree Specific Credits: 73

Required Cumulative GPA: 2.0

Catalog Year: 2018-2019
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
Upper-Division Physics Core		18
Physics Elective		3
Math Requirements		19
Computer Science Requirements		20
Computer Science Core Courses		
Computer Science Electives		
Advanced College Writing Requirement		3
Total Hours		73

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	Fund of Physics w/Calc I and Physics Laboratory I w/Calc	
PHSX 217N & PHSX 218N	Fund of Physics w/Calc II and Physics Laboratory II w/Calc	
Total Hours		10

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 320	Classical Mechanics	3
PHSX 333	Computational Physics	3
PHSX 343	Modern Physics	3
PHSX 423	Electricity & Magnetism I	3
PHSX 499	Senior Capstone Seminar	1
Total Hours		18

Minimum Required Grade: C-

Physics Elective

Code	Title	Hours
Complete one of the following courses:		3
PHSX 141N	Einstein's Relativity	
PHSX 323	Intermediate Physics Lab	
PHSX 327	Optics	
PHSX 330	Communicating Physics	
PHSX 425	Electricity & Magnetism II (strongly recommended)	
PHSX 444	Advanced Physics Lab	
PHSX 446	Thermodyn & Stat Mech	
PHSX 461	Quantum Mechanics I (strongly recommended)	
PHSX 462	Quantum Mechanics II	
Total Hours		3

Minimum Required Grade: C-

Math Requirements

Note: In addition, M 307, STAT 341, and STAT 458 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 225	Introduction to Discrete Mathematics	3
M 273	Multivariable Calculus	4
Total Hours		19

Minimum Required Grade: C-

Computer Science Requirements

Rule: Complete the following subcategories of courses. 20 total credits required.

Computer Science Core Courses

Code	Title	Hours
Complete all of the following courses:		
CSCI 135	Fund of Computer Science I	3
CSCI 136	Fund of Computer Science II	3
CSCI 232	Data Structures and Algorithms	4
CSCI 332	Design/Analysis of Algorithms	3
Total Hours		13

Minimum Required Grade: C-

Computer Science Electives

Code	Title	Hours
Complete 7 credits from any CSCI course numbered 200 and above. The following courses are recommended:		7
CSCI 205	Programming Languages w/ C/C++	
CSCI 361	Computer Architecture	
CSCI 477	Simulation	
Total Hours		7

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-