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.

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; COMPUTATIONAL PHYSICS 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	
Upper-Division Physics		
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
Physics Elective		
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	
PHSX 444	Advanced Physics Lab	
PHSX 446	Thermodynamics & Statistical Mechanics	
PHSX 461	Quantum Mechanics I	
PHSX 462	Quantum Mechanics II	
Math Requirements [1]		
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
Computer Science Requirements		
Complete all of the following courses:		
CSCI 151	Interdisciplinary Computer Science I	3
CSCI 152	Interdisciplinary Computer Science II	3
CSCI 232	Intermediate Data Structures and Algorithms	4
CSCI 332	Advanced Data Structures and Algorithms	3
Computer Science Electives		
Complete 7 credits from any CSCI course numbered 200 and above. The following courses are recommended:		7
CSCI 205	Programming with C/C++	
CSCI 361	Computer Architecture	
CSCI 477	Simulation	
Advanced Writing Requirement [2]		
Complete the following course:		
PHSX 330	Communicating Physics	3
Total Hours		**73**

[1] In addition, M 307, STAT 341, and STAT 458 are recommended.
[2] 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
CSCI 151	Interdisciplinary Computer Science I	3
WRIT 101	College Writing I	4
	Hours	**16**

Sophomore

Autumn

PHSX 311	Oscillations and Waves	2
M 273	Multivariable Calculus	4
M 225	Introduction to Discrete Mathematics	3
General Education Requirement		3
CSCI 152	Interdisciplinary Computer Science II	3
	Hours	**15**

Spring

PHSX 301	Intro to Theoretical Physics	3
M 221	Introduction to Linear Algebra	4
CSCI 361	Computer Architecture	3
General Education Requirement		3
CSCI 232	Intermediate Data Structures and Algorithms	4
	Hours	**17**

Junior

Autumn

PHSX 343	Modern Physics	3
General Education Requirement		6
Elective		5
	Hours	**14**

Spring

PHSX 320	Classical Mechanics	3
PHSX 330	Communicating Physics	3
CSCI 332	Advanced Data Structures and Algorithms	3
Elective		6
	Hours	**15**

Senior

Autumn

PHSX 423	Electricity & Magnetism I	3
PHSX 499	Senior Capstone Seminar	1
CSCI 332	Advanced Data Structures and Algorithms	3
Physics Major Elective		3
Elective		2
	Hours	**12**

Spring

PHSX 333	Computational Physics	3
CSCI 340	Database Design	3
Physics Major Elective		3
General Education Requirements		6
	Hours	**15**
	Total Hours	**120**

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