PHYSICS B.A. - ENGINEERING PHYSICS

The Engineering Physics concentration provides a thorough study of physics and a solid background in engineering and mathematics. Graduates from this program can go on to graduate programs in physics and engineering or seek 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; ENGINEERING PHYSICS CONCENTRATION

Course Requirements

Code	Title	Hours
Lower-Division Physics Core		
Complete all of the following courses:		
PHSX 215N & PHSX 216N	Fundamentals of Physics with Calculus I and Physics Laboratory I with Calculus	5
PHSX 217N & PHSX 218N	Fundamentals of Physics with Calculus II and Physics Laboratory II with Calculus	5
Upper-Division Physics Core		
Complete all of the following courses:		
PHSX 301	Intro Theoretical Physics	3
PHSX 311	Oscillations and Waves	2
PHSX 323	Intermediate Physics Lab	3
PHSX 343	Modern Physics	3
PHSX 423	Electricity & Magnetism I	3
PHSX 446	Thermodynamics & Statistical Mechanics	3
PHSX 499	Senior Capstone Seminar	1
Engineering Core		
Complete all of the following courses:		
EGEN 101	Intro to Engineering Calculation & Problem Solving	3
EGEN 201	Engineering Statics	3
EGEN 202	Engineering Mechanics - Dynamics	3
EELE 201	Circuits I for Engineering	4
Physics and Engineering Electives		
Complete 9 credits of the following courses:		9
PHSX 320	Classical Mechanics	
PHSX 327	Optics	
PHSX 330	Communicating Physics	
PHSX 333	Computational Physics	
PHSX 425	Electricity & Magnetism II	
PHSX 444	Advanced Physics Lab	
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 273	Multivariable Calculus	4
M 274	Introduction to Differential Equations	4
Computer Science Requirements		
Complete one of the following courses:		3
CSCI 151	Interdisciplinary Computer Science I	
PHSX 333	Computational Physics	
Advanced Writing Requirement [2]		
Complete the following course:		
PHSX 330	Communicating Physics	3
Total Hours		**72**

1 M 412 and M 418 are also 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 101	The Physics Experience	1
PHSX 215N & PHSX 216N	Fundamentals of Physics with Calculus I and Physics Laboratory I with Calculus	5
M 171	Calculus I	4
EGEN 101	Intro to Engineering Calculation & Problem Solving	3
Elective or Gen Ed		2
	Hours	**15**
Spring		
PHSX 217N & PHSX 218N	Fundamentals of Physics with Calculus II and Physics Laboratory II with Calculus	5
M 172	Calculus II	4
CSCI 150 or CSCI 151	Introduction to Computer Science or Interdisciplinary Computer Science I	3
WRIT 101	College Writing I (semester depends on last name)	4
	Hours	**16**
Sophomore		
Autumn		
PHSX 311	Oscillations and Waves	2
PHSX 343	Modern Physics	3
EGEN 201	Engineering Statics	3
M 273	Multivariable Calculus	4
General Education Requirement		3
	Hours	**15**

Spring		
PHSX 301	Intro to Theoretical Physics	3
EGEN 202	Engineering Mechanics - Dynamics	3
EELE 201	Circuits I for Engineering	4
General Education Requirement		5
	Hours	**15**
Junior		
Autumn		
PHSX 461	Quantum Mechanics I [1]	3
PHSX 323	Intermediate Physics Lab	3
M 274	Introduction to Differential Equations	4
General Education Requirement		6
	Hours	**16**
Spring		
EGEN 335	[1]	3
PHSX 330	Communicating Physics [2]	3
General Education Requirement		6
Upper Division Course		3
	Hours	**15**
Senior		
Autumn		
PHSX 423	Electricity & Magnetism I	3
PHSX 499	Senior Capstone Seminar	1
Upper Division Course		3
General Elective Course		3
Elective		5
	Hours	**15**
Spring		
PHSX 446	Thermodynamics & Statistical Mechanics	3
PHSX 444	Advanced Physics Lab	3
Upper Division Course		3
Elective		6
	Hours	**15**
	Total Hours	**122**

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Four Year Plan - Alternative Path (Pre-Calc)

Course	Title	Hours
Freshman		
Autumn		
PHSX 101	The Physics Experience	1
EGEN 101	Intro to Engineering Calculation & Problem Solving	3
M 151	Precalculus	4
WRIT 101	College Writing I (semester depends on last name)	4
General Education Requirement		4
	Hours	**16**
Spring		
M 171	Calculus I	4
CSCI 150 or CSCI 151	Introduction to Computer Science or Interdisciplinary Computer Science I	3
General Education Requirement		3
Elective		2
	Hours	**12**
Sophomore		
Autumn		
PHSX 215N & PHSX 216N	Fundamentals of Physics with Calculus I and Physics Laboratory I with Calculus	5
M 172	Calculus II	4
EGEN 201	Engineering Statics	3
General Education Requirement		3
	Hours	**15**
Spring		
PHSX 217N & PHSX 218N	Fundamentals of Physics with Calculus II and Physics Laboratory II with Calculus	5
M 273	Multivariable Calculus	4
EGEN 202	Engineering Mechanics - Dynamics	3
General Education Requirement		3
	Hours	**15**
Junior		
Autumn		
PHSX 311	Oscillations and Waves	2
PHSX 343	Modern Physics	3
M 274	Introduction to Differential Equations	4
General Education Requirement		4
Upper Division Course		3
	Hours	**16**
Spring		
PHSX 301	Intro to Theoretical Physics	3
EELE 201	Circuits I for Engineering	4
PHSX 320	Classical Mechanics	3
PHSX 330	Communicating Physics [2]	3
Elective		2
	Hours	**15**
Senior		
Autumn		
PHSX 323	Intermediate Physics Lab	3
PHSX 423	Electricity & Magnetism I	3
PHSX 461	Quantum Mechanics I	3
PHSX 499	Senior Capstone Seminar	1
General Education Requirement		5
	Hours	**15**
Spring		
PHSX 446	Thermodynamics & Statistical Mechanics	3
EGEN 335	or PHSX elective	3
Upper Division Course		6
General Education Requirement		3
	Hours	**15**
	Total Hours	**119**

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1 Physics elective
2 PHSX 330 offered alternate years. Take as a junior or senior.