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 F	Lower-Division Physics Core			
Complete all of t	he 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 F	Physics Core			
Complete all of t	he 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	e			
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 Eng	jineering Electives	
Complete 9 cred	lits 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 Requireme	ents ¹	
Complete all of t	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 Scien	ce Requirements	
Complete one of	f the following courses:	3
CSCI 151	Interdisciplinary Computer Science I	
PHSX 333	Computational Physics	
Advanced Writin	g Requirement ²	
Complete the fo	llowing course:	
PHSX 330	Communicating Physics	3
Total Hours		72

- ¹ M 412 and M 418 are also recommended.
- 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 Requi	irement	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 Requi	irement	6
	Hours	16
Spring		
EGEN 335	1	3
PHSX 330	Communicating Physics ²	3
General Education Requi	irement	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

Last updated Autumn 2024

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 Require	ement	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 Requir	ement	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

Hours 15	General Education F	<u> </u>	3	
PHSX 217N Fundamentals of Physics with Calculus II 5 & PHSX 218N and Physics Laboratory II with Calculus 4 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 423 <th></th> <th>Hours</th> <th>15</th>		Hours	15	
& PHSX 218N and Physics Laboratory II with Calculus 4 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 Hours 16 Spring 4 PHSX 320 Classical Mechanics 3 Elective 2 Hours 15 Senior Autumn PHSX 323 Intermediate Physics Lab 3 PHSX 451 Quantum Mechanics I 3 <td colspa<="" td=""><td></td><td></td><td></td></td>	<td></td> <td></td> <td></td>			
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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 Autumn PHSX 323 Intermediate Physics Lab 3 PHSX 423 Electricity & Magnetism I 3 PHSX 499 Senior Capstone Seminar 1 General Education Requirement 5 Forms 15 Spring PHSX 446 Thermodynamics & Statistical Mechanics 3				
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General Education Requirement 3 Hours 15	EGEN 335			
General Education Requirement 3 Hours 15	Upper Division Cour	se	6	
Hours 15				

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 $^{^{1}\,}$ Physics elective $^{2}\,$ PHSX 330 offered alternate years. Take as a junior or senior.