BS in Physics

61-68 units

Physics is the foundation for most science and engineering disciplines. The study of physics focuses on broad topics such as matter, energy, gravitation, electricity and magnetism, atomic and nuclear structures, the theory of relativity, and quantum mechanics. By understanding the behavior of matter and energy at a fundamental level, physicists are equipped to further our knowledge of the universe through research and to apply knowledge to new technologies and engineering.

Career Opportunities

The BS in Physics (https://www.apu.edu/clas/programs/physics-major/) equips graduates to teach physics, work in industrial or government engineering or research, or pursue graduate studies in physics or in a variety of related disciplines. Some specific career options include work in materials science, space exploration, aerospace, technical instrumentation, fundamental research, and the computer industry. A physics major is also an excellent foundation for further studies in a wide range of interdisciplinary fields such as medical physics, engineering, meteorology, hydrology, geophysics, or economics.

Requirements

Code	Title	Units
Physics Core (Required)		
PHYC 145	Physics Laboratory I [1]	1
PHYC 146	Physics Laboratory II	1
PHYC 147	Physics Laboratory III	1
PHYC 165	Physics for Science and Engineering: Mechanics [1]	4
PHYC 166	Physics for Science and Engineering: Electricity and Magnetism	4
PHYC 167	Physics for Science and Engineering: Relativity	1
PHYC 168	Physics for Science and Engineering: Waves and Thermodynamics	3
PHYC 470	Writing 3: Advanced Laboratory [2, OS]	3
CHEM 151	General Chemistry I [1]	4
MATH 165	Calculus I	3
MATH 166	Calculus II	3
MATH 268	Multivariable Calculus	3
MATH 270	Ordinary Differential Equations [S]	4
Total Units		**35**

In addition to the required courses above, complete one of the tracks below:

General Physics Track

Code	Title	Units
Required Courses		
PHYC 300	Physics Research Seminar [3, S]	1
PHYC 361	Electricity and Magnetism [ES]	3
PHYC 370	Waves and Optics [EF]	3
PHYC 380	Classical Mechanics [OF]	4
PHYC 401	Thermodynamics [ES]	3
PHYC 431	Computational Methods for Physics [EF]	3
PHYC 440	Quantum Mechanics [OS]	3
PHYC 499	Physics Thesis [3, F]	2
MATH 167	Sequences and Series [F]	1
MATH 269	Vector Calculus [OF]	2
CS 120	Introduction to Computer Science I	4
Choose one of the following:		4
BIOL 151	General Biology I [1]	
CHEM 152	General Chemistry II	

ENGR 215	Electrical Circuits and Systems	
Physics Core		**35**
Total Units		**68**

Physics Secondary Education Track

Code	Title	Units
Required Courses		
BIOL 151	General Biology I [1]	4
PHYC 125	Earth Science Concepts and Applications	3
PHYC 311	Teaching and Learning in STEM [4]	2
PHYC 312	STEM Education Research Seminar [4, 5]	2
PHYC 313	STEM Teaching Practicum [4, 6]	3
Upper-division Electives		**12-13**
Choose four of the following:		
PHYC 361	Electricity and Magnetism ES	
PHYC 370	Waves and Optics EF	
PHYC 380	Classical Mechanics OF	
PHYC 401	Thermodynamics ES	
PHYC 431	Computational Methods for Physics EF	
PHYC 440	Quantum Mechanics OS	
Physics Core		**35**
Total Units		**61-62**

1 Meets the General Education Natural Sciences requirement.
2 Meets the General Education Writing 3 requirement.
3 1 unit of PHYC 300 and 2 units of PHYC 499 meet the General Education Integrative and Applied Learning requirement.
4 These courses are cross-listed as follows: MATH 311/PHYC 311; MATH 312/PHYC 312; and MATH 313/PHYC 313.
5 1-unit course taken twice.
6 1-unit course taken three times.

F	Offered in Fall only
S	Offered in Spring only
F/S	Offered in both Fall and Spring terms
EF	Offered in Fall in even years
ES	Offered in Spring in even years
OF	Offered in Fall in odd years
OS	Offered in Spring in odd years

Program Learning Outcomes

Program Learning Outcomes

Students who successfully complete this program shall be able to:

1. Use mathematical methods to solve quantitative physics problems.
2. Use qualitative reasoning to explain physics phenomena.
3. Draw conclusions from experimental data with measurement uncertainty.
4. Use laboratory apparatus to conduct experiments and collect data.
5. Analyze features of physical models (e.g., by approximation methods, computational methods, etc.).
6. Reconcile scientific and biblical worldviews.