PHYSICS MAJOR (B.A.)

https://ceps.unh.edu/physics/program/ba/physics-major

Description

This program provides an opportunity for a broad and liberal education, which in some cases may be sufficient for graduate work. This program can also be excellent preparation for middle and high school physics teachers, pre-med and pre-law students, and those wishing to pursue a technical career in industry. Because there are fewer required courses than for a B.S., you have time to pursue other academic interests. A judicious choice of electives may also prepare students for interdisciplinary programs that require proficiency in a specialized area of physics.

Requirements

Code	Title	Credits
University Discovery Program requirements [1]		
Bachelor of Arts Degree requirements		
PHYS 400	Physics Seminar I	1
PHYS 407	General Physics I	4
PHYS 408	General Physics II	4
CS 410P	Introduction to Scientific Programming/Python	4
or IAM 550	Introduction to Engineering Computing	
PHYS 505 & PHYS 506	General Physics III and General Physics III Laboratory	4
PHYS 508	Thermodynamics and Statistical Mechanics	4
PHYS 601	Computational Physics Recitation I	1
PHYS 602	Computational Physics Recitation II	1
PHYS 605	Experimental Physics I	5
PHYS 615	Classical Mechanics and Mathematical Physics I	4
PHYS 616	Classical Mechanics and Mathematical Physics II	4
PHYS 701	Quantum Mechanics I	4
PHYS 703	Electricity and Magnetism I	4
PHYS 705	Experimental Physics II	4
Capstone: [2]		2-8
PHYS 795 & PHYS 799	Independent Study and Thesis	
or INCO 790 & PHYS 799	Advanced Research Experience and Thesis	
or PHYS 798	Senior Project	
Mathematics:		
MATH 425	Calculus I	4
MATH 426	Calculus II	4
Select one of the following Options		8-12
Option A:		
MATH 527 & MATH 528	Differential Equations with Linear Algebra and Multidimensional Calculus	
Option B:		
MATH 525 & MATH 526	Linearity I and Linearity II	
Total Credits		**66-76**

1 Note that no physics course can satisfy these requirement for a physics major. The rationale behind this is that a course in physics does not broaden the education of a physics major.

2 A capstone experience is required of all physics majors during their senior year. The Physics Department encourages students to write a senior thesis (PHYS 799 Thesis) for their capstone experience. Other options include independent study research projects (PHYS 795 Independent Study or INCO 590 Student Research Experience) or a special project as part of senior lab (PHYS 705 Experimental Physics II). All capstone experiences must be approved by the undergraduate committee during the student's penultimate semester.

Degree Plan

Suggested Curriculum for B.A. in Physics

In the following table, "other required courses" include Discovery courses, writing-intensive courses, language courses required for the B.A., and free-choice electives.

Course	Title	Credits
First Year		
Fall		
PHYS 400	Physics Seminar I	1
PHYS 407	General Physics I	4
MATH 425	Calculus I	4
Other Required Courses		8
	Credits	**17**
Spring		
PHYS 408	General Physics II	4
MATH 426	Calculus II	4
ENGL 401	First-Year Writing	4
CS 410P or IAM 550	Introduction to Scientific Programming/ Python or Introduction to Engineering Computing	4
	Credits	**16**
Second Year		
Fall		
PHYS 505 & PHYS 506	General Physics III and General Physics III Laboratory	4
MATH 525 or MATH 527	Linearity I or Differential Equations with Linear Algebra	4-6
PHYS 601	Computational Physics Recitation I	1
Other Required Courses		8
	Credits	**17-19**
Spring		
PHYS 615	Classical Mechanics and Mathematical Physics I	4
MATH 526 or MATH 528	Linearity II or Multidimensional Calculus	4-6
PHYS 602	Computational Physics Recitation II	1
Other Required Courses		8
	Credits	**17-19**
Third Year		
Fall		
PHYS 616	Classical Mechanics and Mathematical Physics II	4
PHYS 701	Quantum Mechanics I	4
Other Required Courses		8
	Credits	**16**

Spring		
PHYS 703	Electricity and Magnetism I	4
PHYS 605	Experimental Physics I	5
Other Required Courses		8
	Credits	**17**
Fourth Year		
Fall		
PHYS 705	Experimental Physics II	4
PHYS 508	Thermodynamics and Statistical Mechanics	4
Other Required Courses		4
Capstone		4
	Credits	**16**
Spring		
Other Required Courses		12
Capstone		4
	Credits	**16**
	Total Credits	**132-136**

Student Learning Outcomes

- Students will master the fundamentals of mechanics, electricity and magnetism, quantum mechanics, and thermodynamics.
- Students will have a solid understanding of calculus and differential equations and be able to use mathematics to solve physics problems.
- Students will be proficient at taking measurements in a physics lab and analyzing measurements to draw valid conclusions.
- Students will be able to integrate competently the knowledge and skills acquired in the major and have adequate preparation to succeed in post-undergraduate studies or a professional career.
- Students develop and execute plans for post-graduation to establish their careers. Student will understand the variety of career paths and opportunities that are open to students who have majored in physics.
- Students will be able to present scientific ideas effectively in both written and oral form.