ENGINEERING PHYSICS MAJOR (B.S.)

https://ceps.unh.edu/physics/program/bs/engineering-physics-major

Description

The goal of the UNH BSEP program is to produce broadly-trained engineers who can provide solutions to today’s challenging problems in support of a technologically evolving society. The core of the program is based on interdisciplinary training, complemented with a deeper understanding of the physical principles needed to support careers in engineering, engineering research or, perhaps, further training in systems engineering. The program balances depth and breadth in skill development; flexibility and functionality are what drive the program in the sense that 1) the particular focus is based on the student’s interests, and 2) the breadth of the course selection is guided by the post-graduation goals of the student (e.g., employment versus graduate school).

Requirements

Degree Requirements

Minimum Credit Requirement: 128 credits

Minimum Residency Requirement: 32 credits must be taken at UNH

Minimum GPA: 2.0 required for conferral*

Core Curriculum Required: Discovery & Writing Program Requirements

Foreign Language Requirement: No

All Major, Option and Elective Requirements as indicated.

*Major GPA requirements as indicated.

Major Requirements

A student must have a minimum grade of C in each 400- or 500-level courses that are part of the core requirements and an overall grade-point average of 2.33 in these courses in order to continue in the program.

Degree Plan

Aerospace Track

First Year

Fall Credits
PHYS 407H Honors/General Physics I 4
MATH 425H Honors/Calculus I 4
PHYS 400 Physics Seminar I 1
ENGL 401 First-Year Writing 4

Discovery Course 4

Credits 17

Spring

PHYS 408H Honors/General Physics II 4
MATH 426H Honors/Calculus II 4
CHEM 405 Chemical Principles for Engineers 4
IAM 550 Introduction to Engineering Computing 4

Credits 16

Second Year

Fall

PHYS 505 General Physics III 3
PHYS 506 General Physics III Laboratory 1

Credits 4
PHYS 508  Thermodynamics and Statistical Mechanics  4  
MATH 528  Multidimensional Calculus  4  
Discovery Course  4  

Spring  
PHYS 615  Classical Mechanics and Mathematical Physics I  4  
MATH 527  Differential Equations with Linear Algebra  4  
Discovery Courses  8  

Credits  16  

Third Year  
Fall  
PHYS 616  Classical Mechanics and Mathematical Physics II  4  
ME 608  Fluid Dynamics  3  
ECE 541  Electric Circuits  4  
Discovery Course  4  

Spring  
PHYS 703  Electricity and Magnetism I  4  
ECE 548  Electronic Design I  4  
Elective in Major  3-4  
Discovery Course  4  

Credits  15  

Fourth Year  
Fall  
PHYS 797  Senior Design Project  2  
ECE 651  Electronic Design II  4  
Elective in Major  3-4  
Discovery Course  4  
Free Elective  4  

Credits  17-18  

Spring  
PHYS 797  Senior Design Project  2  
ME 743  Satellite Systems, Dynamics, and Control  3  
Elective in Major  4  
Discovery Course  4  
Free Elective  4  

Credits  17  

Total Credits  129-131  

Engineering Research Track  
First Year  
Fall  
PHYS 407H  Honors/General Physics I  4  
MATH 425H  Honors/Calculus I  4  
CHEM 405  Chemical Principles for Engineers  4  
PHYS 400  Physics Seminar I  1  
Discovery Course  4  

Credits  17  

Spring  
PHYS 408H  Honors/General Physics II  4  
MATH 426H  Honors/Calculus II  4  
IAM 550  Introduction to Engineering Computing  4  
ENGL 401  First-Year Writing  4  

Credits  16  

Second Year  
Fall  
PHYS 505  General Physics III  3  
PHYS 506  General Physics III Laboratory  1  
MATH 528  Multidimensional Calculus  4  
ECE 541  Electric Circuits  4  

Credits  16  

Third Year  
Fall  
PHYS 508  Thermodynamics and Statistical Mechanics  4  
ECE 651  Electronic Design II  4  
PHYS 616  Classical Mechanics and Mathematical Physics II  4  
Discovery Course  4  

Credits  16  

Spring  
PHYS 703  Electricity and Magnetism I  4  
ECE 543  Introduction to Digital Systems  4  
ECE 543  Introduction to Digital Systems  4  
Discovery Course  4  

Credits  16  

Fourth Year  
Fall  
PHYS 797  Senior Design Project  2  
PHYS 704  Electricity and Magnetism II  4  
PHYS 708  Optics  4  
ECE 633  Signals and Systems I  3  
Elective in Major  4  
Discovery Course  4  

Credits  17  

Spring  
PHYS 797  Senior Design Project  2  
ECE 651  Electronic Design II  4  
IAM 550  Introduction to Engineering Computing  4  
ME 608  Fluid Dynamics  3  
Elective in Major  4  

Credits  21
Student Learning Outcomes

Students are expected to achieve the outcomes below upon graduation.

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- An ability to communicate effectively with a range of audiences.
- An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.