

## Engineering Physics

Bachelor of Science Degree

### Contact

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### Admission Requirements

*(In years as established by the college)*

A high school diploma with the following specific courses:

- 4 English
- 1 Biology (recommended)
- 2 Algebra I & II
- 1 Geometry
- 1 Pre-Calculus
- 2 Lab Science (chemistry and physics)
- 2 History/Social Studies  
Academic electives (to equal at least 17 total credits)

*To ensure current mathematical skills, students should take a mathematics course during their senior year of high school.*

### Did You Know?

The Engineering Physics Program offers research opportunities in condensed matter, soft condensed matter, computational, health, atomic and molecular physics; nonlinear optics; astronomy and physics; statistical mechanics; soft condensed matter; biophysics; and physics education.

## College of Engineering

### Program Description

Engineering physics is a curriculum that combines the study of physics and engineering in one program. It is a major in applied science with a carefully chosen sequence of engineering electives in one of the traditional engineering fields. Engineering physics majors select an engineering sequence, concentrating in electrical, biological, computer, mechanical, civil or chemical engineering. Engineering physics is an Accreditation Board for Engineering and Technology-accredited engineering program. Engineering physicists are unique among engineers because they have specialized in the sciences — primarily physics — that underlie engineering. Their depth of training in the basic sciences provides them with the ability to readily adapt to changing technologies and to multiple career opportunities. Students should consider engineering physics if they are interested in learning how principles and practices in a selected engineering field relate to scientific origins. UMaine engineering physics was the first accredited EP program in the world, is one of only about 20 such programs in the United States, and is the only accredited such program in New England. The UMaine Department of Physics and Astronomy and the College of Engineering offer high-quality, rigorous programs. These programs include a great deal of academic and social support for students to be successful in obtaining their degrees and embarking on exciting careers. Faculty and staff are strongly oriented toward student success, and that makes a big difference to our undergraduates.

### Specialized Information

Students take laboratory and hands-on courses every semester. Introductory physics courses have an integrated laboratory session each week. In the sophomore year, we have separate modern physics and mechanics laboratory courses. In the junior year, required lab courses cover electronics and more modern physics, with optional optics lab and nuclear physics labs also available. The engineering courses that students will have chosen for their EP program will also generally include some laboratory-type courses. Finally, our senior project is a two-semester course sequence in which students develop their own research and design project in coordination with an engineering faculty member. Recently our undergraduates have had internships at a non-linear optics laboratory in France, an astronomical observatory in Chile, the Jet Propulsion Laboratory in California and NASA's Marshall Space Flight Center in Alabama. One student had her own astronomical observing run at a large telescope in Arizona, and another student was a member of a team using a large telescope in California. Yet another worked on a team developing sensors that can operate at such high temperatures that they can be used to monitor the health of the insides of jet engines. Several of our undergraduate students installed and are operating a radio telescope on the roof of Bennett Hall.

### Associated Honor Societies and Student Organizations

Majors are encouraged to participate in the Society of Physics Students, the Society of Women Engineers and other organizations in their chosen engineering field. In addition, majors frequently qualify for membership in the national honor societies Sigma Pi Sigma and Tau Beta Pi.

## Representative Courses

|         |  |         |  |
|---------|--|---------|--|
| PHY 100 | Introduction to Physics and Astronomy                    | PHY 400 | Career Preparation in Physics and Engineering Physics II |
| PHY 121 | Physics for Engineers and Physical Scientists I          | PHY 441 | Physical Electronics Laboratory                          |
| PHY 122 | Physics for Engineers and Physical Scientists II         | PHY 442 | Modern Experimental Physics                              |
| PHY 200 | Career Preparation for Physics and Engineering Physics I | PHY 454 | Electricity and Magnetism I                              |
| PHY 223 | Special Relativity                                       | PHY 455 | Electricity and Magnetism II                             |
| PHY 229 | Physical Measurements Laboratory I                       | PHY 469 | Quantum and Atomic Physics                               |
| PHY 230 | Physical Measurements Laboratory II                      | PHY 472 | Geometrical and Fourier Optics                           |
| PHY 236 | Introductory Quantum Physics                             | PHY 476 | Mathematical Methods in Physics                          |
| PHY 238 | Mechanics  | PHY 481 | Project Laboratory in Physics I                          |
|         |  | PHY 482 | Project Laboratory in Physics II                         |

## NEBHE Program

Applicants to this program who reside in Vermont or Rhode Island are eligible for reduced tuition (in-state plus 50 percent) under the New England Regional Student Program, administered through the New England Board of Higher Education (nebhe.org).

## Career and Graduate Opportunities

Engineering physics graduates hold positions with companies such as Boeing, National Labs, Fairchild Semiconductor and National Semiconductor. They may also pursue careers in physics education, marine sciences, biophysics and microscopy with lasers.

## UMaine Graduate Programs

Master of Science in Engineering Physics

Master of Science in Physics

Doctor of Philosophy in Physics

## About UMaine

The University of Maine, founded in Orono in 1865, is the state's premier public university. It is among the most comprehensive higher education institutions in the Northeast and attracts students from across the U.S. and more than 60 countries. It currently enrolls 12,000 total undergraduate and graduate students who can directly participate in groundbreaking research working with world-class scholars. Students are offered 88 bachelor's degree programs, 64 master's degree programs, 25 doctoral programs and one of the oldest and most prestigious honors programs in the U.S. The university promotes environmental stewardship on its campus, with substantial efforts aimed at conserving energy, recycling and adhering to green building standards in new construction. For more information about UMaine, go online (umaine.edu). Equal opportunity information also is available online (umaine.edu/eo).

## How do I apply?

Visit [go.umaine.edu](http://go.umaine.edu) for an application as well as information about academics and life at UMaine.



## Academic Programs 2011-12

The latest versions of the UMaine fact sheets are online ([factsheets.umaine.edu](http://factsheets.umaine.edu)). This fact sheet is intended for informational purposes only and is subject to change.

