

# Cornell Engineering

## School of Applied and Engineering Physics

### UNDERGRADUATE DEGREE PROGRAM

The Engineering Physics (EP) program is oriented towards students who love the challenge of solving technical problems both fundamental and applied. This major offers a broad-based engineering education to prepare you for diverse careers in a rapidly changing technical world. Whether your interest is in basic research or in biotechnology, quantum information sciences, renewable energies, microelectronics, nanotechnology, photonics and optical engineering, software development, or any of the other burgeoning fields of engineering that require outstanding technical background, an engineering physics bachelor's degree is your key to success.

EP offers you an opportunity to develop a deeper understanding of the fundamentals of rapidly changing technology through an extensive physics and mathematics program in an engineering context. With electives and laboratory courses, you can easily combine this enhanced knowledge with the practical aspects of conventional engineering disciplines.

The undergraduate EP curriculum at Cornell is designed to prepare you for a career in research or development in pure or applied science, advanced technology, or engineering. It focuses on the fundamentals of physics and mathematics, both experimental and

theoretical, that are at the heart of modern engineering and science and have broad applicability. By choosing a particular concentration, you can combine this physics base with a firm background in a conventional area of engineering or applied science. Engineering physics emphasizes the basic physics underlying most engineering developments, and mathematical tools vital to all engineers and scientists. The EP curriculum encourages students to extend themselves and develop broad skills in the physical sciences. Our curriculum fosters mastery in areas of basic physics and related

skills that are critically important. Combined with hands-on experience with computers, electronics, and lasers, this is excellent preparation for a broad range of careers.

EP students may carry out their own research projects during the junior and senior years. Internationally recognized faculty, coupled with sizable research funding, permits the study (both theoretical and experimental) of many subjects, including integrated-circuit technology, wave-function engineering, electron and ion-beam nanofabrication, lasers and optics, superconducting devices, quantum information, physics of renewable energy, plasma physics, biological physics, materials physics, and x-ray physics.

Engineering physics encourages the development of experimental skills to complement formal coursework, offering five experimental courses in the areas of nanoscience, computers, lasers, optics and electronics.

About half of EP graduates take positions in high-technology industries, at starting salaries at the top end of the scale for engineers. The others go to graduate school or to professional programs in engineering, law, medicine, and business administration; the reputation

**BREAK  
THE RULES  
to ADVANCE  
ENGINEERING  
SCIENCE**

### EP REQUIRED COURSES

AEP 3200	Introductory Mathematical Physics
AEP 4200	Intermediate Mathematical Physics
AEP 3330	Mechanics of Particles and Solid Bodies
AEP 3550	Intermediate Electromagnetism
AEP 3560*	Intermediate Electrodynamics
AEP 3610	Introductory Quantum Mechanics
AEP 3620*	Intermediate Quantum Mechanics
AEP 3630	Electronic Circuits
AEP 4230	Statistical Thermodynamics
AEP 4340*	Fluid and Continuum Physics
PHYS 4410	Advanced Experimental Physics

\* select 2 out of 3



ENGINEERING PHYSICS

## SOME AREAS OF FACULTY RESEARCH

atomic, molecular, and chemical physics

biophysics and biotechnology

condensed matter physics and materials science

electron, ion, x-ray, and scanned-probe spectroscopy and microscopy

laser development

nanoscience and nanobiotechnology

optical physics and photonics

plasma physics and astrophysics

quantum electronics, photonics, and quantum information science

renewable energy

of engineering physics makes graduates extremely attractive candidates for graduate admission and financial support in many different disciplines.

Most engineering physics graduates develop careers in industry as staff engineers or scientists or technical directors; in research and administrative positions in nonprofit and national laboratories; as professors in almost all engineering and scientific disciplines at major universities; as consultants; or as physicians or lawyers.

## EP SAMPLE ELECTIVE COURSES

AEP 1100 Lasers and Photonics

AEP 1200 Introduction to Nanoscience and Nanoengineering

AEP 2520 The Physics of Life

AEP 2550 Engineering Quantum Information Hardware

AEP 2640 Interfacing the Digital Domain with an Analog World

AEP 3300 Modern Experimental Optics

AEP 4380 Computational Engineering Physics

AEP 4400 Quantum and Nonlinear Optics

AEP 4450 Electromagnetic and Optical Metamaterials

AEP 4500 Introductory Solid State Physics

AEP 4700 Biophysical Methods

AEP 5500 Physics of Renewable Energy

AEP 5510 Symmetry in Materials Physics

AEP 5570 Applied Electrodynamics

AEP 6610 Nanocharacterization

## MASTER OF ENGINEERING DEGREE PROGRAM

Jump start your career with the Master of Engineering (M.Eng.) program in applied and engineering physics (AEP). This one-year master's program offers advanced study and training in applied physics. It provides valuable graduate training and research/design project experience sought after by industry, government, and R&D organizations. The curriculum is tailored to fit the needs of individual students, and the project component offers an opportunity for independent research under the supervision of leading scientists and engineers.

## AEP BY THE NUMBERS

EP undergraduate students 65

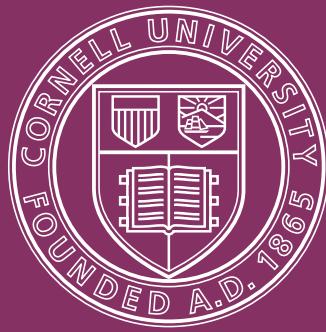
AEP graduate students 70

Starting salaries of B.S. Engineering Physics graduates (3-year average)

Low \$62,000

Median \$76,500

High \$105,000



Cornell University is an equal-opportunity affirmative-action educator and employer.  
Produced by the Office of Engineering Admissions.

**aep.cornell.edu**