

# SCHOOL OF ENGINEERING AND APPLIED SCIENCE

Penn School of Engineering is unlike any other. Traditionally untraditional. Pioneers in interdisciplinary education and research. Theory linked with real-world practice. The path for students who want to shape the future.

With the pace of innovation and technological advancement accelerating ever faster, engineers hold the keys to the next generation's routine wonders.

As an Ivy League institution — and the first university in the nation — Penn delivers a transformative experience in the classroom and laboratory, while ensuring its engineering and applied science students receive a fully rounded liberal arts education.

Penn Engineering is a pioneer in interdisciplinary education, allowing students the flexibility to craft a program that suits their individual interests, career, or graduate education plans. Both Bachelor of Science in Engineering (BSE) and Bachelor of Applied Science (BAS) degrees are offered, along with specialized dual-degree programs, an array of majors and minors, special programs, and study-abroad opportunities.

Penn Engineering students get valuable and extensive hands-on experience, conducting research and pursuing creative designs and new products alongside faculty renowned in their fields. The working relationship with faculty pervades Penn Engineering, where full-time faculty teach all core undergraduate courses, and each student has a faculty advisor.

As the global marketplace for technology grows, graduates go on to leadership roles in business, medicine, law, and academia. They leave armed with the technical knowledge, imagination, communication skills, and understanding of the social and human context of their work, all engendered with a fervor for the future nurtured at Penn Engineering.

**Learn more about our history:** <http://www.seas.upenn.edu/about-seas/history.php>.

**Learn more about our school leadership:** <http://www.seas.upenn.edu/about-seas/dean-staff.php>.

**Two key elements distinguish the Penn Engineering experience from that provided by many other institutions: Exceptional academic programs, and practical design and research experience.**

Our undergraduate programs emphasize both theory and practice while forming intellectual linkages across a breadth of disciplines. The opportunity for hands-on research, over the four years, allows undergraduates the chance to learn about the creation of knowledge, further explore their chosen field, and thereby become collaborators in the search for knowledge. The design experience over the four years, culminating in the senior design project, challenges students to utilize their academic training and problem-solving skills in practical ways, and provides them with direct experience with real-world problems that they will encounter as practicing engineers.

Technology is transforming our times and our lives, no longer on a scale of decades but of years and even months. A successful career through such changing times requires engineering graduates endowed with skills that are applicable to widely different technologies, skills that transcend the details of any one job. Such is the result of an education

that pays much more attention to the fundamental than to the trendy, to the creative more than to the routine. Engineers must also be firmly educated as responsible citizens, concerned with the impact of their work on society.

Penn Engineering is an integral partner in Penn's initiatives to prepare students for leadership in a high-tech world. Our goal is to prepare students for leadership roles in engineering and applied science as well as in other fields, such as medicine, business, and law, for which creativity, critical quantitative thinking, effective communication skills, and a strong commitment to humane values are essential.

## Mission of the School

1. The creation and dissemination of scholarly research in both basic and applied arenas to be an international center of engineering excellence and the regional catalyst for technological innovation;
2. The design and delivery of engineering education known for its rigor, breadth and relevance to prepare its students to become global leaders in technology-based fields.

## Mission Statements of Bachelor of Science in Engineering Programs (ABET-accredited)

- Bioengineering (<http://www.be.seas.upenn.edu/about-academics>)
- Chemical and Biomolecular Engineering (<http://www.cbe.seas.upenn.edu/about-ugrad>)
- Computer Science (<http://www.cis.upenn.edu/ugrad/abet.shtml>)
- Computer Engineering (<http://www.seas.upenn.edu/cmpe/accreditation.php>)
- Electrical Engineering (<http://www.eese.upenn.edu/about-ugrad>)
- Materials Science and Engineering (<http://www.mse.seas.upenn.edu/about-ugrad/accreditation.php>)
- Mechanical Engineering and Applied Mechanics (<http://www.me.upenn.edu/about-ug-ed/accreditation.php>)
- Systems Science and Engineering (<http://www.eese.upenn.edu/about-ugrad>)

Our extraordinary faculty-to-student ratio provides great opportunities for undergraduate students to work in state-of-the-art research laboratories during the academic year and in the summer. Below are examples of student research, along with helpful information to guide undergraduates toward finding research positions at Penn Engineering.

For more information, visit: <http://www.seas.upenn.edu/undergraduate/research/index.php>.

## Finding a Research Mentor and Research Experiences

Students are encouraged to explore the Penn Engineering Faculty Expertise Directory (<http://www.seas.upenn.edu/directory/departments.php>), featuring the School's standing faculty and is searchable by department, research center affiliation, and research expertise keyword. Users can identify which faculty are conducting research in a specific area and contact faculty members whose research interests them.

The Engineering Dean's Advisory Board (EDAB) puts together a guide for fellow students that gives step-by-step instructions and tips on how to secure research positions as an undergraduate.

For Bioengineering majors, the Penn student chapter of the Biomedical Engineering Society (BMES) has assembled its own student guide on starting up research.

### **Summer Undergraduate Research in Engineering (SURE)**

Penn Engineering's world-acclaimed faculty, along with state-of-the-art research laboratories and highly interdisciplinary curricula, offers summer research opportunities for talented undergraduates who seek hands-on research experience. From robotics and computer animation, nanotechnology, genomics and biotechnology, Penn's centers and institutes are at the forefront of research on multiple scientific and technological frontiers.

### **International Summer Undergraduate Research in Engineering (iSURE)**

Opportunities for undergraduates are available during the summer to spend eight to 12 weeks on a research internship in one of Penn Engineering's partner institutions abroad.

### **Littlejohn Undergraduate Research Program**

Thanks to a generous gift by Angus Littlejohn, the School of Engineering is able to offer Summer Research Opportunities to Penn Engineering Students. The program is open to rising, sophomores, juniors and seniors.

The program intends to provide students the opportunity to get involved in hands-on engineering research under the supervision of a faculty member. Topics of research include all areas covered by the departments in the School of Engineering and Applied Science. Students will receive a stipend of \$4,500 for a 10 week period.

### **Rachleff Scholars Program**

This program offers Penn Engineering undergraduates the opportunity to gain valuable research experiences with standing faculty and to participate in a community of peers who share a common interest in research and scholarly inquiry.

The following BSE programs are accredited by the Engineering Accreditation Commission of ABET (<http://www.abet.org>).

- Bioengineering (<http://www.be.seas.upenn.edu/about-academics>)
- Chemical and Biomolecular Engineering (<http://www.cbe.seas.upenn.edu/about-ugrad>)
- Computer Science (<http://www.cis.upenn.edu/ugrad/abet.shtml>)
- Computer Engineering (<http://www.seas.upenn.edu/cmpe/accreditation.php>)
- Electrical Engineering (<http://www.esse.upenn.edu/about-ugrad>)
- Materials Science and Engineering (<http://www.mse.seas.upenn.edu/about-ugrad/accreditation.php>)
- Mechanical Engineering and Applied Mechanics (<http://www.me.upenn.edu/about-ug-ed/accreditation.php>)
- Systems Science and Engineering (<http://www.esse.upenn.edu/about-ugrad>)

The BSE program in Computer Science is accredited by the Computing Accreditation Commission of ABET (<http://www.abet.org>).

For more information, visit: <http://www.seas.upenn.edu/undergraduate/handbook/programs/abet-acreditation.php>.

Each student is assigned a faculty advisor with whom they are required to meet at least twice per year. No student is permitted to

register for classes in any semester without first meeting with an advisor and a review of their Permission to Register form (<https://www.seas.upenn.edu/undergraduate/pdf/ug-advisor-signoff.pdf>). Students who take the time to prepare for these meetings generally find them beneficial and informative. Faculty advisors are the best source of information about electives within the major, research opportunities, and options for graduate study.

For more information, visit: <https://www.seas.upenn.edu/undergraduate/advising/>.