

ENGINEERING



What is the purpose of engineering but to solve human problems for the benefit of humans? At Swarthmore, we believe the best engineers are the ones who understand not only the widgets they design but also the people whose needs are to be met.

— CARR EVERBACH, PROFESSOR OF ENGINEERING

Swarthmore headlines the list of the handful of small liberal arts colleges that offer an engineering department. Entwined with the arts and sciences of the College, the program is as unusual as it is dynamic.

The engineering program lifts students to their full intellectual and personal potential, blending technical prowess with social responsibility. It provides a rich and rigorous education that gives students the tools to adapt to new technical and societal challenges, communicate effectively, and collaborate. Students leave with the creativity and confidence to solve problems of ever-growing complexity, as well as the compassion to consider the social impact of their actions.

Reflecting the College's excellence throughout the liberal arts, the engineering department offers a core program of engineering, science, and math along with an array of electives to build a flexible base of knowledge and technique. Our interdisciplinary

connections abound. Our students are able to gear their studies toward areas like civil/environmental, computer, electrical, or mechanical engineering, and weave in disciplines such as chemistry or computer science.

Swarthmore gave me a community of mentors and friends without whom I wouldn't have found the success I did, personally or professionally.

— ATOUSA NOURMAHNA'D '17

All of our classes (among them, Mobile Robotics, Solar Energy Systems, Computer Vision, and Digital Signal Processing) include labs, and students interested in delving more deeply into specialized study may obtain credit for courses taken abroad or at colleges and universities in the Greater Philadelphia area, such as the University of Pennsylvania.

The student experience will reach another gear in 2019, when the department moves into the Biology, Engineering, and Psychology (BEP) building. Featuring cutting-edge spaces and equipment, BEP will build or strengthen interdisciplinary connections between academic departments across the curriculum, with all of its equipment available for hands-on classwork and individual projects. It will light the fuse for the experience that our alumni so often tell us was pivotal: figuring out how to make something work.





INTELLECTUAL BREADTH AND DEPTH

Unlike most engineering programs, we require students to only take about a third of their courses in engineering, leaving plenty of room to explore the social sciences and humanities, and/or to study abroad. Half of all students take a second major, such as economics, computer science, or math. This program gives students a firm grounding in the fundamentals across various engineering fields. It focuses on problem-solving, collaborating with peers and faculty, writing, and giving oral presentations.

**What do our students do after graduation?
The short answer is, anything they want.**

The result? Students gain the raw material to excel with the elite graduate schools and companies that can mold them into specialists. This opens up a whole new set of career opportunities, in and outside of engineering, that require creativity and intellectual agility. Swarthmore graduates won't be replaced by a robot or an algorithm. They'll find or forge new paths, following their passions.

Research and teaching are connected here, and increasingly so. As soon as students arrive, they are taken on a tour of the faculty labs and encouraged to get

involved in active research. A third of them seize that opportunity, with many finding their names on published papers.

Small class sizes also ensure that students work closely with their professors throughout their time at Swarthmore, with the faculty relying on undergraduates as their research assistants. That spirit suffuses extracurriculars like the faculty-mentored Society of Women Engineers or local and national hackathons in which Swarthmore students compete—whatever is sparking insight for our students, our professors are immersed in it.

PATHS TAKEN BY OUR GRADUATES

Graduate schools and employers prize Swarthmore graduates' intellectual breadth, and our engineering students are known for their grasp and creative integration of a wide array of material. About 40 percent of graduates shift right to top graduate schools, with the rest gaining employment ranging from creative startups to titans like Google or IBM, or applying engineering expertise to interests including social service, architecture, medicine, and law. Swarthmore graduates gravitate to the more cutting-edge and creative jobs, or start their own companies. But whatever they pursue, they demonstrably add value to the world.

THE SENIOR DESIGN PROJECT

As a capstone to their Swarthmore experience, our students complete a yearlong design project to integrate and build on what they learned in their coursework. Dazzling and data-driven, past projects include:

- **Autonomous operation of an elevator by a robot**
- **Adaptive noise cancellation**
- **Building fuel cells and hybrid electric vehicles**
- **Creating a brain-computer interface to control virtual reality**
- **Automatic malaria diagnosis in digital blood-smear images**



A team of Swarthmore students builds an energy-efficient vehicle with a hydrogen fuel cell to bring to the national Shell Eco-Marathon competition.

