Engineering

at Swarthmore
Today's engineers are tackling our most pressing challenges including the search for alternatives to petroleum-based power, maintaining an aging transportation infrastructure in the United States, supporting infrastructural development abroad, addressing the future of telecommunications, and pioneering new computer designs that are faster while using less power.

Swarthmore-educated engineers employ the tools of science and mathematics to develop practical solutions for the challenges facing human society. We prepare students not only to think but also to act upon their ideas by providing extensive lab experience as a central part of our curriculum. Students also benefit from studying engineering within a liberal arts college, gaining a diverse education that encourages their creativity and communications skills, and broadens their perspective.
Course Work

Swarthmore's Engineering Department provides an excellent technical education in concert with an outstanding liberal arts program. Small class sizes ensure that students work closely with faculty members throughout their time at Swarthmore. Our engineering curriculum includes a core program of engineering, science, and mathematics as well as a broad selection of elective courses to provide a flexible base of knowledge and technique. Within engineering, students may specialize in civil/environmental, computer, electrical, or mechanical engineering, or develop a customized program by combining these fields with additional coursework in areas such as chemistry, biology, or computer science.

Swarthmore engineering students enjoy an unusual degree of curricular flexibility, allowing them to pursue a wide range of interests. A significant percentage of each student's coursework may be unrelated to their engineering degree. Many students complete a second major in four years in areas as diverse as art, economics, mathematics, and religion. About one-third of all engineering students also study abroad.

Lab Work

Solving lab problems is a trademark of Swarthmore engineers—and one reason that graduate school and employers are so enthusiastic about our graduates. All engineering courses include laboratory work that involves direct interaction with the professor; there are no graduate students or other lab assistants. This hands-on experience is essential to the creative spirit and practical understanding that characterize good engineering.

In their first semester, students are encouraged to take a methodology course that focuses on group projects such as building a computer-controlled electric pedal-guitar or a roving weather-station robot. In most upper-level courses and many core courses, students complete a term project that allows them to focus on a problem that particularly interests them.

As seniors, students complete a yearlong design project that provides an opportunity to integrate and build upon what they have learned in their coursework. Recent projects include autonomous operation of an elevator by a robot, building a wireless sensor network, developing adaptive noise-cancelation techniques, building fuel cells and hybrid electric vehicles, and designing a constructed wetland to reduce pollution in stormwater runoff.

Research and Facilities

The department's facilities include laboratories for general instruction, individual student projects, and faculty research in electronics, electromagnetism, optics, systems dynamics and control, communications, computer architecture, robotics, engineering materials, solid and structural mechanics, fluid mechanics, fossil and solar energy conversion, acoustics, nonlinear dynamics, and environmental water and air pollution control.

Many professors invite students to collaborate with them on research projects, sometimes resulting in co-authored publications. Students often apply for and are accepted to participate in summer research at other institutions.

After Swarthmore

Swarthmore-educated engineers understand the broader impact of engineering on our world. They have the skills to adapt to new technical challenges, communicate effectively, and collaborate with others. They are prepared to directly enter the workforce as engineers, pursue graduate education in engineering, or use their education to follow careers in medicine and other professional programs outside traditional realms of engineering.

Recent graduates work for major employers including Aramark, Google, IBM, McKinsey & Company, and Microsoft, while others choose smaller companies, including start-ups. Many have chosen graduate programs in areas such as electrical, mechanical, oceanic, robotic, computer, and aerospace engineering at universities including the Massachusetts Institute of Technology, Columbia, Stanford, Princeton, and Carnegie Mellon. Graduates can also combine their engineering expertise with other interests and go into law, medicine, architecture, urban planning, economics, education, social service, or research.

Accreditation

The Swarthmore engineering program is accredited by the Engineering Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone: (410) 347-7700. Our graduates earn a Bachelor of Science degree in engineering, and they are prepared to:

- Be flexible and resourceful, learn and apply new knowledge, and adapt successfully to novel circumstances and challenges.

- Communicate and work effectively with people from a broad variety of backgrounds at both a technical and personal level.

- Apply engineering principles and methodology to the design and analysis of systems and to the solution of a wide variety of problems.

- Consider scientific, technological, ethical, societal, economic, political, and/or environmental issues in a local or global context.

Learn more about Swarthmore's Engineering Department online at www.swarthmore.edu/engineering.
Almost every class feels like a seminar with active discussion and interaction between the professor and students. I really value the support I get from the faculty and my peers. The camaraderie that exists within the department has made my engineering experience at Swarthmore extremely rewarding.

Swarthmore engineering developed my ability to think and work independently. This has been a real asset in my work experience. Thanks to my liberal arts education, I appreciate solutions and problems that do not naturally fall within standard engineering disciplines.

My broad and rigorous engineering and chemistry classes helped prepare me for my multidisciplinary doctoral research. In particular, I was well equipped for laboratory research because all of my Swarthmore engineering classes included a lab or major lab project.

Though the course projects I've been involved in, such as the bridge-building contest or instrument construction challenge, have always been a lot of fun, I think the best experience is knowing that I am among others who are passionate about what they do.
swarthmore.edu/engineering

Engineering faculty and staff members welcome questions from prospective students and their families.

Please address email queries to engineering@swarthmore.edu.

For complete course descriptions and department requirements, see Swarthmore's online course catalog at www.swarthmore.edu/coursecatalog.