

Dartmouth Class of 2023 – Engineering at a Glance

What do engineers do?

- Engineers apply science to create technological solutions to societal problems. They build devices and they design processes, machines and systems to accomplish useful tasks. Also, engineers explore the frontiers of knowledge through applied research. Our Mission: *"To prepare the most capable and faithful for the most responsible positions and the most difficult service."* – Sylvanus Thayer

How are engineers educated at Dartmouth?

1. Mathematics, natural science, engineering science
 - The *Engineering Sciences major* (A.B. degree) emphasizes a broad approach to engineering fundamentals. The student gains a multidisciplinary perspective for solving real-world problems.
 - The *Bachelor of Engineering program* (B.E. degree, accredited by ABET, following the A.B. degree) prepares the student to enter the engineering profession.
2. The art of design – lots of project work
 - Engineers must be able to balance form and function, solve problems, make decisions, work in teams and deal with constraints (physical, temporal and economic).
3. Liberal arts – more at Dartmouth than in other engineering programs
 - Engineers must think critically about non-technical as well as technical matters, and communicate effectively both with technologists and non-technologists. They must be able to write and to speak clearly and persuasively, in order to promote *their* ideas and projects.
 - Effective technological solutions require an understanding of social context: history, culture, politics, economics, etc.

There are several ways to be involved with engineering at Dartmouth

1. *The Engineering Sciences major.* The undergraduate major leads to the A.B. degree. The program consists of seven prerequisites + eight courses in the major + the culminating experience.
2. *Modified majors.* A modified Engineering Sciences major permits a student to design an interdisciplinary major: six courses in Engineering Sciences + four courses in the modifying area + the necessary prerequisites and culminating experience. Here is how the modified majors relate to specific professional fields. In your sophomore year, you can discuss with your advisor whether a modified major is right for you.
 - Biotechnology (biology)
 - Chemical engineering (chemistry)
 - Computer engineering (computer science)
 - Geotechnical Engineering (earth science)
 - Environmental engineering (environmental science)
 - Architecture (studio art)
 - Management and financial engineering (economics)
 - Public Policy (public policy)
 - Neuroscience (psychology)

3. ***The Engineering Physics major.*** Seven prerequisites, six required courses, four electives and the culminating experience. Unlike a modified major, the engineering physics major is an even balance of engineering and physics courses (five of each). It is good preparation for graduate work in engineering or applied physics.
4. ***Biomedical Engineering Sciences Major.*** Five to Seven engineering sciences courses and four to six courses in biology, chemistry, and biochemistry. The Biomedical Engineering Sciences major is offered to students interested in medical school. Faculty from Thayer School and the Geisel School of Medicine jointly advise the research projects. For more information, contact Professor Brian Pogue.
5. ***The Bachelor of Engineering program.*** The B.E. is our professionally-accredited engineering program, and consists of nine to ten courses beyond the A.B. in Engineering Sciences. It can be completed in one to three additional terms following graduation from Dartmouth. Admission to the B.E. program is automatic for students who graduate in the Engineering Sciences major. Financial aid is available, on the basis of need. With the help of advanced placement credits, about 20-30% of our graduates complete the A.B. and B.E. degrees simultaneously (in twelve terms).
6. ***Minor in Engineering Sciences.*** The minor is appropriate for students who want to complement a full major in one subject with studies in engineering. The minor consists of five courses in Engineering Sciences + five prerequisites in math (3) and physics (2).
7. ***Minor in Human Centered Design.*** The minor in Human-Centered Design is an interdisciplinary program focused on the process of innovation for addressing human needs. The minor consists of six courses, two of which are engineering design foundation courses, two psychology and two design electives.
8. ***Minor in Materials.*** This minor, jointly offered by engineering, physics, and chemistry, is designed for students who wish to complement a major in science with the interdisciplinary study of materials science. It consists of four courses chosen from a list of offerings + the necessary prerequisites.
9. ***Non-majors.*** Students majoring in other subjects often take one or two engineering courses to enhance or broaden their studies (e.g., biotechnology, biomedical, environmental, or computer engineering). We also offer courses (numbered below 20) for liberal arts students to learn about technology. These courses satisfy the TAS distribution requirement.
10. ***Extracurricular Activities.*** Every year many students, including first-years, participate in numerous activities including research projects, internships such as WISP, and our brand new First Year Engineering Research Experience, Thayer School clubs, and study abroad opportunities.

What can I do with an engineering degree?

- Thayer School (Bachelor of Engineering) graduates work for a variety of companies/organizations, e.g., Amazon Robotics, Bain & Co., Bridgewater Associates, Eaton Corporation, GE Appliances, General Mills, Goldman Sachs, Google, IBM, Microsoft, Sunpower, Tesla, etc. Average starting salary for 2018 B.E. graduates was \$76,281.
- Over seventy percent of our A.B. graduates pursue further education at the B.E. level or higher. Many pursue masters and doctoral degrees in engineering, while others study medicine, law or business, and consider their technical education to be excellent preparation.

Majoring in engineering does not restrict other Dartmouth options

- Engineering majors do LSA and FSP (including exchanges with Chulalongkorn University in Bangkok, Thailand, Chinese University of Hong Kong, and Technical University of Denmark), complete pre-med courses, play varsity sports and participate in performing arts groups.
- Here's how the courses add up for an A.B. student with no advanced placement:

Dartmouth liberal arts Writing 5, First-year seminar, foreign language, humanities and social science distributives, world culture	10-14 courses
Math and science prerequisites MATH 3, 8, 13; PHYS 13, 14; CHEM 5; ENGS 20 or COSC 1&10	7-9 courses
Engineering sciences major ENGS 21, 22, 23; two from 24, 25, 26, 27; two from (30), (31 or 32), (33 or 34), (35 or 36), (37); one elective in engineering; one elective in engineering or a science course; and a culminating experience (which may replace one engineering elective). Modified majors have additional prerequisites and require 10-11 major courses.	9-10 courses
Free electives Additional liberal arts or engineering, second major, or minor	4-9 courses
Total to graduate from Dartmouth	35 courses

Some useful web sites

More about Thayer: <https://engineering.dartmouth.edu/academics>

Thayer School Career Services: <https://engineering.dartmouth.edu/careers>

Dartmouth Emerging Engineers: <https://engineering.dartmouth.edu/dee/>

First Year Research in Engineering:

<https://engineering.dartmouth.edu/academics/undergraduate/ab/first-year-research/>

Connect with a real-world engineer: <http://www.mentornet.net/> (it's not just for women)

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