

3-2 Engineering

Although sometimes regarded as similar, science and engineering significantly differ. Science seeks to uncover the forces that shape the world, as well as to explain the mechanisms by which events occur in nature. Moreover, science involves an experimental process that leads to the single, elegant answer. Engineering, while using the knowledge provided by science, aims to find feasible solutions to real-world problems. Involving a design process, engineering finds the solution not through experimentation, but rather through tinkering with ideas, negotiation with clients, optimization of design, and evaluation of alternatives. Because of constraints, which may range from laws and ethics to costs and environmental impact, the optimal engineering approach may be vastly different from the best scientific solution.

To arrive at the appropriate solution, engineers need to evaluate the strategies offered by science in the societal context in which the problem arises. Additionally, engineers must be able to communicate effectively and to work as part of a design team. Traditional engineering programs offer students little time to develop skills in non-technical areas such as economics, laws, ethics, or culture, despite the importance of knowledge in these areas to the engineering design process. Studies by the National Science Foundation and the U.S. Department of Education have noted this deficiency as a major barrier to the training of successful engineers. The 3-2 Engineering Program is designed to give students both technical knowledge and a broad grounding in the humanities and social sciences.

In the 3-2 program, students spend the first three years at Oberlin and then attend one of the affiliated engineering schools for two years. At the end of the five years, students receive two degrees: a Bachelor of Arts from Oberlin and a Bachelor of Science in Engineering from the engineering school. Oberlin's partners for the 3-2 program are Caltech (California Institute of Technology), Case Western Reserve University (Cleveland), and Washington University (St. Louis). Partnership with Columbia University (New York) is scheduled to begin with the 2007-2008 academic year.

At Oberlin, students in the 3-2 program take introductory chemistry, introductory physics, and four semesters of calculus. In addition, students must acquire proficiency in a computer programming language and satisfy the College's general requirements for writing proficiency, course distributions in the social sciences and humanities, and cultural diversity. Students in the 3-2 program do not normally complete the requirements for a departmental major at Oberlin. While at Oberlin, students can explore their interest in engineering through internships, intensive engineering courses at Washington University during Oberlin's January Winter Term, or discussions with representatives of the engineering schools. One significant advantage of the program is its flexibility, since it allows students to prepare for careers in engineering without eliminating other options.

Students are encouraged to discuss their interest in the program as early as possible with Oberlin's engineering advisor, Taylor Allen, who is trained as a biomedical engineer and who is an Associate Professor of Biology. Students' final decision about entering the program can be made as late as their third year, at which time participants apply for admission to one of the partner engineering schools. Although admission is at the discretion of the engineering school, the admission is virtually automatic for students who are recommended by Oberlin and who have a B average or better in their courses.

While some other colleges offer 3-2 programs, Oberlin's rigorous academic environment and rich extracurricular opportunities set it apart. Oberlin has a long tradition of excellence and leadership in science education: three Oberlin alumni have been awarded the Nobel prize -- Robert Millikan, class of 1891, for physics; Roger Sperry, class of 1935, for medicine or physiology; and Stanley Cohen, class of 1945, also for medicine or physiology. Studies by the National Science Foundation and other groups find that Oberlin consistently leads all other four-year, private institutions in being the baccalaureate origin of the highest number of science and engineering doctorates. Students at Oberlin have numerous opportunities to engage in research

with faculty and to pursue independent research and study through private readings with professors.

Oberlin's excellence in science is matched by equally distinguished programs in the humanities and the social sciences. Oberlin's medium size allows it to offer an unusually rich academic program without losing the close faculty-student interaction that is the hallmark of a liberal arts college. Within the College of Arts and Sciences, students can choose from over 40 majors ranging from Economics to Law and Society, Environmental Studies to Creative Writing.

At Oberlin, students have the unique opportunity to develop skills in leadership and working as part of a team through the Oberlin Student Cooperative Association (OSCA), the largest student organization on campus. A student-owned and operated non-profit corporation, OSCA provides housing or dining services to almost one-quarter of all Oberlin students. OSCA members are responsible for running all aspects of the co-ops, including long-term planning, ordering food, cooking and cleaning, managing finances, training new members, and facilitating. The Center for Service and Learning also enables students to acquire valuable experience through community service.

Gaining the benefits of a rich and varied education at Oberlin, as well as the technical training at an engineering school, students graduate from the 3-2 program with a distinctive range of skills that appeals to employers and that enhances the students' abilities to succeed as engineers.

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