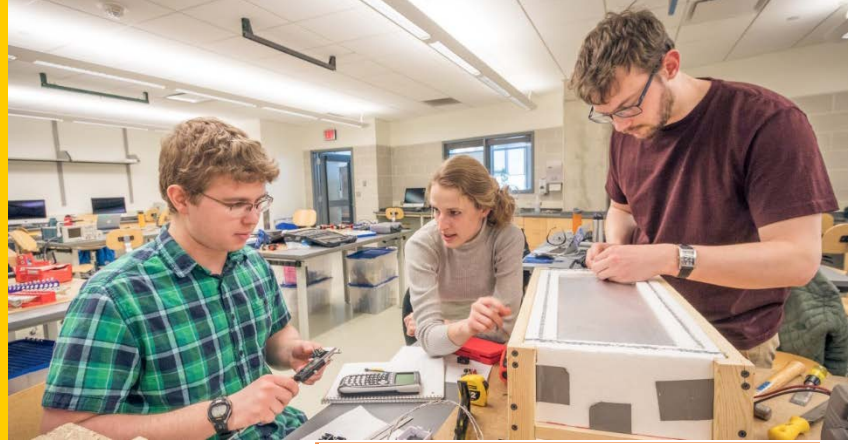




ENGINEERING



Options for Pursuing Engineering

Most students choose to complete a B.A. degree at St. Olaf before beginning work on a Master of Science in Engineering or Doctorate Degree in engineering at the school of their choice. Completing the M.S.E. typically takes 1.5 to 2 years after the B.A. is earned. A cooperative “dual degree” program exists that enables a student to receive a B.A. degree from St. Olaf and a B.S. degree in engineering from Washington University in St. Louis, MO, in a five-year program.

Prerequisites for Engineering Graduate Schools

Graduate engineering programs vary in the prerequisites required for admission. Majoring in physics at St. Olaf is strongly recommended to prepare for engineering graduate school, as many students have successfully entered M.S.E and Ph.D. engineering programs after completing the physics major. While majoring in other fields and continuing to engineering graduate school is possible, it is recommended that you discuss this directly with the Engineering Advisor. Summer research experiences or internships are highly recommended.

Below are some sample prerequisites from different programs:

[University of Minnesota – Department of Civil, Environmental, and Geo-Engineering](#)

[University of Minnesota – Department of Biomedical Engineering](#)

[University of Minnesota – Chemical Engineering and Materials Science](#)

[University of Iowa – College of Engineering](#)

“No profession unleashes the spirit of innovation like engineering.”

From research to real-world applications, engineers constantly discover how to improve our lives by creating bold new solutions that connect science to life in unexpected, forward-thinking ways.

We are counting on engineers and their imaginations to help us meet the needs of the 21st century.”

- National Academy of Engineering

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Recommendations within the Physics Major at St. Olaf

Many students who complete the physics major at St. Olaf pursue careers in engineering, most frequently by attending masters or doctorate programs after completing their St. Olaf physics degree. There are a number of electives in the physics major that serve to help prepare students for careers in engineering.

Civil Engineering: To prepare for graduate study in civil engineering, students are advised to consider Introduction to Engineering Design (PHYS 160), Engineering Design Practicum (PHYS 360), Materials Engineering and Nanoscience (PHYS 362), Electronics (PHYS 246) and/or other physics electives, along with appropriate courses in chemistry, mathematics, and computer science.

Electrical Engineering: To prepare for graduate study in electrical engineering, students are advised to take Quantum Mechanics (PHYS 376) and Electronics (PHYS 246) and are strongly encouraged to take Statistical Physics (PHYS 379). Students should also consider Introduction to Engineering Design (PHYS 160), Engineering Design Practicum (PHYS 360), Materials Engineering and Nanoscience (PHYS 362), and/or other physics electives, along with appropriate courses in chemistry, mathematics, and computer science.

Mechanical Engineering: To prepare for graduate study in mechanical engineering, students are advised to consider Introduction to Engineering Design (PHYS 160), Engineering Design Practicum (PHYS 360), Materials Engineering and Nanoscience (PHYS 362), Electronics (PHYS 246) and/or other physics electives, along with appropriate courses in chemistry, mathematics, and computer science. Quantum Mechanics (PHYS 376) is strongly encouraged for students interested in nanoscale technology and engineering.

Other engineering fields: There are many fields within engineering, both within and outside the broad areas of civil, electrical, and mechanical engineering. These include acoustical engineering, aerospace engineering, biomedical engineering, and geotechnical engineering, to name a few. Engineering graduate programs are typically looking for solid preparation in areas such as physics, chemistry, mathematics, and computer programming. Some fields, such as biomedical engineering, require background in biology or other areas as well. Consult with the Engineering Advisor and specific graduate programs for further information.

Extracurricular Engineering Activities

Consider participating in an extracurricular group focused on engineering or STEM education!

[Environmental Engineering Club](#)

[STOC Machine \(Engineering Team\)](#)

[Science Alliance](#)

Dual Degree Program with Washington University

The following is directly from the [Washington University Dual Degree Website](#). For a list of pre-approved St. Olaf courses, [follow this link](#).

Course Requirements

These are the core requirements for all undergraduate professional engineering study, which should be completed before entry into WashU.

- **Chemistry:** one semester of general chemistry with lab
- **Computer Programming:** one course or certified proficiency in a high-level language (MATLAB experience is helpful for Biomedical Engineering, Chemical Engineering and Mechanical Engineering majors)
- **English Composition:** one course, acceptable examination scores, or college certification of proficiency
- **Humanities & Social Sciences:** no fewer than 15 semester hours in approved areas (This sequence must include at least six semester hours in Humanities and three semester hours in Social Sciences).
- **Mathematics:** a calculus sequence which includes exposure to multivariable calculus and a separate course in differential equations
- **Physics:** one-year calculus-based sequence with lab
- **Total Credits:** a minimum of 90 semester hours of transferable college credit (courses with grades below C- do not transfer)

Department-specific requirements

- **Biomedical Engineering:** a one-year biology sequence that covers cellular, molecular and developmental biology and genetics and a second semester of general chemistry with lab
- **Chemical Engineering:** one semester of biology that covers cellular, molecular and developmental biology, a second semester of general chemistry with lab, and one semester of organic chemistry with lab (a second semester of organic chemistry, physical chemistry, and a course on energy and environment from a scientific point of view are strongly recommended)
- **Computer Science & Computer Engineering:** a second computer programming course