

Contact

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Admission Requirements

(In years as established by the college)

A high school diploma with the following specific courses:

- 4 English
- 2 Algebra I & II
- 1 Geometry
- 1/2 Trigonometry
- 2 Lab Science (*chemistry & physics*)
- 2 History/Social Studies
- Academic electives (*to equal at least 17 total credits*)

To ensure current mathematical skills, students should take a mathematics course during their senior year of high school.

Major Requirements

- 43 credits Chemical Engineering
- 6 credits Engineering (other)
- 9 credits Technical Electives
- 51 credits Sciences & Mathematics
- 18 credits Humanities & Social Sciences
- 3 credits College Composition

130 Minimum total credit hours required for graduation

College of Engineering

Program Description

Chemical engineers work in industries where raw materials are converted into finished products. Rubber, paint, drugs, plastics, paper, polymers and steel are all made using processes developed, improved and supervised by chemical engineers. The undergraduate program at the University of Maine is designed to provide an understanding of the principles underlying each of these and many other process industries. The curriculum offers additional courses in novel materials, process control, and pulp and paper because these are all important areas of chemical engineering and are relevant to the economy of the state of Maine and the United States. Students may also design options in environmental control and related topics, subject to departmental approval.

Classes stress group and individual assignments with many opportunities to practice presentation skills together with analysis and application of math and computers. Students are encouraged to work together, especially as juniors and seniors, to address challenging problems.

The department has excellent computing facilities for all undergraduates, who become well versed in the latest professional software. Skills and ideas learned at the university are applied through co-op employment following the sophomore year. Nearly all sophomores accept co-op jobs to begin in May or August based on preceding September-November on-campus interviews.

Undergraduate student laboratories are among the most modern anywhere. The faculty has demonstrated strength as both teachers and as researchers. A Learning Center with multimedia presentation capabilities provides students opportunities to develop state-of-the-art communication skills.

Students who have earned good grades, know how to apply engineering principles as a result of having practical experience, and who can make effective presentations in writing, orally and graphically are in great demand by chemical engineering employers throughout the United States.

Career Opportunities

Typical activities and duties for Chemical Engineering graduates are: **Process Engineering**—developing methods of reducing raw materials use, investigating process modifications to reduce energy consumption, reducing pollution and environmental impacts, supervising production workers and maintaining a process, showing paper mills how to use chemicals efficiently, exploring new paper coating/paint formulations to achieve improved properties; **Equipment Design/Modification**—troubleshooting equipment and processes to resolve malfunctions, exploring the effects of modifying process equipment, helping customers learn to use machinery more efficiently, developing testing equipment, designing machinery to separate recyclable materials from waste, designing and starting-up pollution control equipment; **Technical Sales & Service**—helping manufacturers solve specialized technical problems, showing customers better ways to use new and existing chemicals, sales of new technical systems and equipment; **Process Control**—providing improved control to enhance product uniformity, controlling processes to reduce pollution emissions, controlling processes to optimize raw material and energy use, starting-up and teaching operators to use computer process controls; **Product Development**—evaluating materials to reduce foam or microbiological growth, modifying paper coating composition to provide improved printing, creating or modifying computer software to improve process control, developing new products to meet customer demands.

Career Opportunities (continued)

Recent graduates have been hired by the following companies: **Process Engineering:** (Pulp and Paper Industry)—Fraser Papers, Garden State Paper Co., International Paper, Mead Corp., P.H. Glatfelter Co., Sappi Fine Paper and Westvaco Corp. (Other Process Industries)—DuPont, Pioneer Plastics, Proctor and Gamble, National and Semiconductor, Toray Plastics, and Teradyne Corp. **Sales/Technical Service:** Air Liquide, Buckman Labs, Hercules and Nalco Chemical. **Engineering/Process Design:** Black Consulting Group, Arthur D. Little Inc., ABB Process Automation, Foxboro, Simons Engineering, I and C Systems Control. **Equipment Manufacturers:** Honeywell-Measurex, Ingersoll Rand. **Environmental:** Maine Dept. of Environmental Protection, ABB Environmental Corp. **Consulting:** Woodard and Curran.

General Education Requirements*

ENG 101	College Composition
18 credits	Human Values & Social Context area (<i>a single course may satisfy more than 1 sub-category, but a total of 18 credits must be completed</i>) Western Cultural Tradition Social Context & Institutions Cultural Diversity & International Perspectives Population & the Environment Artistic & Creative Expression
2 courses	Designated Writing Intensive (<i>1 must be within the major</i>)
2 courses	Biological or Physical Sciences (<i>must include at least 1 laboratory course</i>)
1 course	Ethics (<i>emphasis on discussion of ethical issues in 1 course or series of courses</i>)
6 credits	Mathematics (<i>including statistics & some computer science, only 3 credits in computer science can count toward this requirement</i>)
1 capstone	An approved experience in which the student integrates the components of his or her undergraduate training to perform at a professional level. The capstone experience is usually completed during the senior year in consultation with the student's academic advisor.

**All UMaine students must complete these general education requirements, which are counted in the total credit hours required for graduation and may be contained in the Major Requirements previously listed.*

Specialized Information

Under the New England Regional Student Program, administered through the New England Board of Higher Education, the Bachelor of Science degree in Chemical Engineering is open to applicants who reside in Vermont for reduced tuition (in-state tuition plus 50 percent). The department also offers a minor in Chemical Engineering with concentrations in process engineering or pulp and paper technology. The minor is open to all undergraduate, degree-seeking University of Maine students and requires the completion of 22-23 credit hours.

Graduate Study

The Department of Chemical and Biological Engineering offers a Master of Science and a Doctor of Philosophy degree in Chemical Engineering and Master of Science in Biological Engineering. Many B.S. graduates have continued their education at the nation's most competitive graduate schools. Typical choices have been: Cornell University; Institute of Paper Science and Technology; Johns Hopkins University Medical School; Massachusetts Institute of Technology; Tufts University—both Dental and Medical School; University of California, Berkeley; University of Colorado; University of Delaware; University of Florida; University of Maine; University of Texas, Austin; University of Vermont Medical School.

Academic Programs 2008-2009

Please refer to the web site (<http://factsheets.umaine.edu/>) for the most updated version of the fact sheets.

This fact sheet is intended for informational purposes only and is subject to change.