

Chemical Engineering Program Specializations

(Revision December 12, 2013)

Because of the breadth of chemical engineering opportunities, the department offers a number of specially designed program specializations that provide unique training and course selection to those students who wish to concentrate in a particular area or technology. The current program specializations are Biochemical Engineering, Environmental Chemical Engineering, Pre-Medicine/Biomedical in Chemical Engineering, and Pulp, Paper and Bio-resources Engineering.

Biochemical Engineering Specialization

Chemical engineers trained in biochemical engineering and biotechnology are the key to successful commercialization of new biologically based processes ranging from high value pharmaceuticals to new food processes. This program specialization provides a strong biology and chemistry fundamental background for graduate work in biochemical engineering and a plan of study to meet these objectives. Students in this specialization take BCHE 5180, CHEN 5800, and Biochemical Engineering Technical Electives* (9 hours). These courses replace Technical Elective I-IV and the Advanced Chemistry Elective.

Biomedical Engineering Specialization

This specialization provides the necessary preparation for students wanting to do graduate work in biomedical engineering or work in a career with an emphasis of medical applications of chemical engineering.

Students in this specialization take PHIL 1030, CHEM 2081, BCHE 5180, CHEN 5810, and Biomedical Engineering Technical Electives* (8 hour). These courses replace Technical Elective I-IV, the Advanced Chemistry Elective and PHIL 1040.

Computer-Aided Chemical Engineering Specialization

Chemical engineers with expertise in the application of advanced computer-aided tools in areas like process systems engineering, process control, and advanced process technology are highly sought after by all process industries. The program specialization provides appropriate courses for an individual with interests in advanced use of computers for solving chemical and biological engineering problems. Students in this specialization take BCHE 5180 and Computer-Aided Chemical Engineering Technical Electives* (12 hours). These courses replace Technical Elective I-IV and the Advanced Chemistry Elective.

Environmental Chemical Engineering Specialization

The environmental specialization in chemical engineering prepares students for careers in the expanding environmental arena. Students specializing in this area learn about the chemical processes and reactions that affect the environment, pollution prevention, the latest standards for air, water and land quality, as well as, hazardous materials management. This specialization prepares students for environmental positions in a broad range of manufacturing and service industries all of which must comply with increasingly complex environmental standards, and in various state and federal agencies. Students in this specialization take BCHE 5180 and Environmental Chemical Engineering Technical Electives* (12 hours). These courses replace Technical Elective I-IV and the Advanced Chemistry Elective.

Pre-Medicine Specialization

This specialization provides the necessary preparation for students wanting to go to medical school. A Pre-Med series of courses, when completed, provides a chemical engineering degree while simultaneously meeting medical school requirements.

Students in this specialization take PHIL 1030, CHEM 2081, BCHE 5180, CHEN 5810, BIOL 1030/1031 and Pre-Medicine Technical Electives* (4 hour). These courses replace Technical Elective I-IV, PHIL 1040 and the Advanced Chemistry Elective.

Students in this program specialization who are interested in medical school must also work with the director for Pre-Health Professions in the College of Science and Mathematics.

Pulp, Paper and Bioresource Engineering Specialization

This specialization prepares students for challenging and rewarding careers in the pulp, paper and bioresource industries. These industries are unique in being capable of sustainable development with a renewable raw material base, recyclable products, and processing technology able to achieve energy self-sufficiency and environmental compatibility. This specialization prepares students for a broad range of career paths in process engineering, product development, biotechnology and sustainable engineering. Students in this specialization take CHEM 2081, BCHE 5180, CHEN 3090, CHEN 4100, CHEN 5110 and CHEN 5800. These courses replace Technical Elective I-IV and the Advanced Chemistry Elective.

* A list of approved technical electives for this specialization is available from the department undergraduate advisor.