

MAJOR IN CHEMICAL AND BIOLOGICAL ENGINEERING, SUSTAINABLE ENGINEERING CONCENTRATION

An education in chemical and biological engineering provides the intellectual foundation for our graduates to work on solutions to society's biggest problems (both current and future problems). For example, our graduates could go on to develop innovative materials and products, to design new devices to improve animal or human health or environmental health, and to design processes for the safe production of chemicals and biochemicals, the production of alternative energy sources, and prevention of hazardous waste. The possibilities are limitless. Chemical and biological engineering is a powerful blend of basic sciences and the skills to quantitatively describe, predict, and control all changes of matter. Our curriculum is based on the sciences of physics, chemistry, biology, and mathematics. It includes engineering science and design methods, as well as humanities and social sciences. The Chemical and Biological Engineering program provides an environment that promotes a sense of professionalism, the development of project management skills, and an appreciation for the value of life-long learning. Graduates of our program are well prepared to enter a variety of professions, or to pursue further advanced education. The broad, strong scientific basis of chemical and biological engineering has kept our graduates consistently near or at the top in salary and demand among B.S. graduates.

Sustainable Engineering Concentration

Sustainable Engineering aims to develop strategies to create and maintain the conditions under which humans and nature can exist in productive harmony to support present and future generations. In addition to a chemical and biological engineering foundation, the breadth of topics relevant to sustainable engineering concentration will give students the ability to choose elective courses tailored to their interests in sustainability. Topics include ecosystem/environmental engineering, life cycle assessment, sustainable chemistry, air and water quality, and systems engineering. These courses will enable and encourage students to solve the complex engineering problems at the core of sustainable engineering.

The Chemical and Biological Engineering major is accredited by the Engineering Accreditation Commission of ABET (<http://abet.org/>).

Learning Objectives

Upon successful completion, students will be able to:

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. Function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.
6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.