

# CHEMICAL AND BIOLOGICAL ENGINEERING

Chemical engineers exploit advances in chemistry and biology to create new products, design chemical processes, develop energy resources, and protect the environment. Students receive a thorough grounding in chemistry, biology, mathematics and physics. With this broad scientific training, chemical engineers work effectively on a diverse set of problems involving chemical, physical, and biological phenomena. For example, chemical engineers develop environmentally benign and safe processes to make the chemical products that people depend on. They work in research and development laboratories, creating polymeric materials with improved performance and durability. They work in manufacturing, making vaccines and antibiotics. They invent new ways to keep our food and water supplies safe. Opportunities for chemical engineers span numerous industries: pharmaceuticals, polymers, energy, food, consumer products, biotechnology, and electronic and optical materials. Graduates understand the needs of society, and use their training in science and technology to meet those needs.

The chemical engineering program develops the student's capability for invention and analysis of chemical processes and products. Students in the program take several classes in chemistry, along with courses in physics, mathematics, and biology. The curriculum provides a rigorous education in the fundamental chemical engineering sciences of thermodynamics, transport phenomena, and kinetics, as well as more applied areas such as materials science, biochemical engineering, or chemical process design. Because engineers must be skilled communicators, the curriculum places considerable emphasis on technical report writing, team projects, and formal and informal oral presentation. In addition, students broaden their understanding of people and society by taking several courses in the humanities and social sciences.

The B.S. program in chemical engineering leads to a wide variety of careers. Graduates are prepared for professional lives in industry, government, engineering design, or consulting companies. Graduates with a more practical, hands-on approach are employed in manufacturing support, process development, product development, design, construction, or technical sales. They rapidly advance to responsible technical supervisory and management positions. Graduates with a research interest work to improve understanding of scientific engineering principles, and to apply these principles to solve emerging problems. Entrepreneurial graduates work in smaller enterprises, or create their own businesses, developing the major industries of tomorrow. An undergraduate degree in chemical engineering provides a strong basis for advanced study in graduate school, or for further training in medicine, law, or policy.