DAN F. SMITH DEPARTMENT OF CHEMICAL AND BIOMOLECULAR ENGINEERING

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Chair: Tracy J. Benson, Ph.D

Chemical and biomolecular engineering is the profession in which a knowledge of mathematics, chemistry, and other natural sciences gained by study, experience, and practice is applied with judgment to develop economic ways of using materials and energy for the benefit of mankind. The chemical engineer enters into almost every modern industry. From petroleum to synthetic rubber, from semiconductor to medicines, the chemical engineer engages in design, research, development, production, sales, and management. Among the fields in which the chemical engineer is of prime importance are petroleum, petrochemicals, metals, plastics, paints, drugs and foods, paper, glass, dyes, synthetic fibers, and a host of others.

The Dan F. Smith Department of Chemical and Biomolecular Engineering was among the first at Lamar University to seek accreditation for its undergraduate program. The bachelor's program in chemical engineering is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

Mission

The mission of the Department of Chemical and Biomolecular Engineering is to provide students with high quality, accessible undergraduate and graduate chemical engineering education; to engage and empower students with skills and knowledge to thrive in professional careers, and to serve society through economic and technological development of Southeast Texas and beyond.

Program Educational Objectives

Constituents: Current students, alumni, employers, and faculty

a. Advance professionally with increasing leadership and responsibility beyond entry-level in an industry relevant to chemical engineering.
b. Contribute to organizational objectives with significant societal benefits in an environmentally and ethically responsible manner.
c. Engage in life-long learning through professional activities and training, the pursuit of higher educational degrees, and/or individual professional development.

Program Criteria

The Chemical and Biomolecular Engineering Program criterion as listed in the ABET "Criteria for Accrediting Engineering Programs" is as follows:

Curriculum

The curriculum must provide a thorough grounding in the basic sciences including chemistry, physics, and/or biology, with some content at an advanced level, as appropriate to the objectives of the program. The curriculum must include the engineering application of these basic sciences to the design, analysis, and control of chemical, physical, and/or biological processes, including the hazards associated with these processes.

Programs

- Chemical and Biomolecular Engineering (B.S.) (https://catalog.lamar.edu/college-engineering/dan-f-smith-department-chemical-biomolecular-engineering/chemical-engineering-bs/)
- Chemical Engineering (Ph.D.) (https://catalog.lamar.edu/college-engineering/dan-f-smith-department-chemical-biomolecular-engineering/engineering-phd/)
- Fermentation Science and Engineering Graduate Certificate (https://catalog.lamar.edu/college-engineering/dan-f-smith-department-chemical-biomolecular-engineering/fermentation-science-engineering-graduate-certificate/)
- Master of Engineering - Chemical (M.E.) (https://catalog.lamar.edu/college-engineering/dan-f-smith-department-chemical-biomolecular-engineering/engineering-me/)
- Master of Engineering Science - Chemical (MES) (https://catalog.lamar.edu/college-engineering/dan-f-smith-department-chemical-biomolecular-engineering/engineering-science-mes/)

Student Outcomes

The student outcomes used by the chemical and biomolecular engineering program are those published in the ABET “Criteria for Accrediting Engineering Programs” document. Those outcomes are as follows:

a. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
b. an ability to 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
c. an ability to communicate effectively with a range of audiences
d. an ability to 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
e. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
f. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
g. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.