

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

Location: 2616 Cherry Building

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Chair: Dr. Nicholas Brake

Civil and environmental engineering is a people-serving profession and as such is vital to the world's economic, political, and social well-being. The many areas to which civil engineers make substantial contributions include bridges, dams and levees, harbors, waterways and irrigation facilities, buildings, airports, highways, pipelines, railroads, power lines, water supply systems, and waste treatment facilities. Civil engineers engage in a wide range of activities such as research, design, development, management, and the control of engineering systems and their components. With today's fast-paced technological changes, civil engineering provides unique and unlimited career opportunities that can only be met by professionally educated people.

The civil engineering program is designed with a broad base to prepare men and women for careers in various phases of civil engineering and to enable them to perform other managerial and technical functions that require scientific and engineering backgrounds. The curriculum embraces a sound core of humanities and social studies courses in addition to those in physics, chemistry and mathematics, which form the substructure of engineering sciences. Areas of study include geotechnical, structural, water resources, environmental, transportation, and construction engineering. Electives are available to fit the individual interest of the civil engineering student.

Because of the wide scope of activities in which the civil engineer is engaged, and the broad spectrum of student interest, civil engineering graduates may choose either to enter the profession immediately after receiving their bachelor's degree or go directly to graduate school. No matter what the student chooses, the curriculum provides a firm foundation for today's world.

The bachelor's program in civil engineering is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>

Mission

The mission of the Department of Civil & Environmental Engineering is to provide students with high quality, accessible undergraduate and graduate civil 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

The following broad statements describe what the Department's undergraduate engineers are expected to attain a few years after graduation.

- a. Increasing leadership and responsibility beyond entry level that meet the emerging and evolving demands of civil engineering;

- b. Communication and project management skills for effective problem solving;
- c. Engagement in life-long learning through professional activities, training, pursuing licensure and understanding of professional ethics, public safety, cost constraints, sustainability, environmental impacts, and policy implications.

Program Criteria

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

Curriculum

The curriculum must include:

- a. Application of:
 - i. mathematics through differential equations, probability and statistics, calculus-based physics, chemistry, and either computer science, data science, or an additional area of basic science.
 - ii. engineering mechanics, materials science, and numerical methods relevant to civil engineering.
 - iii. principles of sustainability, risk, resilience, diversity, equity, and inclusion to civil engineering problems.
 - iv. the engineering design process in at least two civil engineering contexts.
 - v. an engineering code of ethics to ethical dilemmas.
- b. Solution of complex engineering problems in at least four specialty areas appropriate to civil engineering.
- c. Conduct of experiments in at least two civil engineering contexts and reporting of results.
- d. Explanation of:
 - i. concepts and principles in project management and engineering economics.
 - ii. professional attitudes and responsibilities of a civil engineer, including licensure and safety.

Programs

- Engineering (M.E.) (<https://catalog.lamar.edu/college-engineering/civil-environmental-engineering/engineering-me/>)
- Certificate in Engineering with Nature (<https://catalog.lamar.edu/college-engineering/civil-environmental-engineering/engineering-with-nature/>)
- Civil Engineering (B.S.) (<https://catalog.lamar.edu/college-engineering/civil-environmental-engineering/civil-engineering-bs/>)
- Engineering (D.E.) (<https://catalog.lamar.edu/college-engineering/civil-environmental-engineering/engineering-de/>)
- Engineering (MES) (<https://catalog.lamar.edu/college-engineering/civil-environmental-engineering/engineering-mes/>)
- Environmental Engineering (M.S.) (<https://catalog.lamar.edu/college-engineering/civil-environmental-engineering/environmental-engineering-ms/>)
- Environmental Studies (M.S.) (<https://catalog.lamar.edu/college-engineering/civil-environmental-engineering/environmental-studies-ms/>)

Student Outcomes Used by the Undergraduate Program

- 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