

Civil Engineering

The Field of Civil Engineering

The civil engineer plans, designs, builds, maintains, and operates facilities for the private and public sectors to solve many of the complex problems facing modern society. These facilities include bridges, dams, highways, transit systems, airports, tunnels, irrigation systems, water distribution and wastewater treatment plants, space satellites and launching systems, and industrial and commercial buildings. The challenges facing the civil engineer are endless. The multitude of activities offers an almost unlimited range of career opportunities to satisfy individual interests, aptitudes, and goals. These opportunities exist in industry, private consulting, and in public agencies.

Mission Statement

The mission of the Civil Engineering Program is to provide the educational environment necessary for civil engineering students to develop their potential. The program also seeks to enrich students' lives in a culturally diverse environment. Civil engineering provides the high quality education required for students to fully develop their professional qualities and skills to serve society.

Program Objectives

The objective of the Civil Engineering Program is to prepare its students to accomplish the following:

- be well- rounded to function effectively both as professional civil engineers and as responsible and informed citizens.
- practice the profession of civil engineering proficiently with well- balanced preparation in engineering fundamentals and practical applications in any of the following four areas of civil engineering: environmental, geotechnical, structural, or transportation.
- use the technical tools and skills required for effective professional practice and continue learning in their professional lives to remain abreast of new developments and advances.
- function effectively in multi-cultural and multidisciplinary groups in their practice of the civil engineering profession and be able to communicate effectively with engineering peers, other professionals, and with the public in general.
- practice their profession with an understanding of the social and political implications of their professional engineering work and do so guided by the ASCE Code of Ethics.

The Program

The Civil Engineering Program at Fresno State provides the student with a basic background in the fields of applied mechanics and structures, geotechnical engineering, hydraulic engineering, environmental engineering, and transportation engineering. The student's program may emphasize one of these areas with the appropriate choice of senior electives. Additionally, the curriculum includes humanities, social sciences, and communication skills.

Emphases

Civil engineering students may tailor their programs to have an emphasis in environmental/water resources engineering, geotechnical engineering, structural engineering, or transportation engineering.

Careers in Civil Engineering

Employment opportunities for civil engineers in industry and in government agencies remain at a high level as a result of increasing urban growth and land development and the emphasis on the maintenance and repair of the nationwide infrastructure including the transportation system. Civil engineers continue to be in high demand for careers in infrastructure planning, design, and construction. Civil engineers are also in demand to meet the need for

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**Department of Civil
and Geomatics
Engineering**
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**B.S. in Civil
Engineering**
**M.S. in Civil
Engineering**

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Civil Engineering

building structures and to meet challenges of environmental quality standards.

Future Education

In order to become a registered professional engineer, the individual must first pass the Engineer-in-Training (EIT) Examination. After appropriate job experience in engineering, the professional engineer candidate must then pass the Professional Engineer Examination. The bachelor's degree in civil engineering will prepare the student for graduate school (M.S., Ph.D. work) at any university as long as the student graduates with the necessary grade point average.

General Preparation

The basic skills and characteristics needed for success in civil engineering include abilities in mathematics and the sciences plus a desire for a career that is challenging and rewarding.

High School Preparation

Students should meet California State University's admission requirements in terms of college preparatory course requirements, grade point average, and test scores. Additional recommended courses are advanced mathematics (1/2 year), chemistry and physics (1 year), CAD drawing (1/2 year), and computer programming (1/2 year).

College Program

Students should consult the university's *General Catalog* for specific major and university requirements, for General Education requirements, and for approved technical electives.

General Education

Students should follow the program for the civil engineering major. For specific requirements, see the program outline for the civil engineering curriculum in the university's *General Catalog*.

Course Requirements

Since changes may occur, students should consult the *General Catalog* and a Fresno State adviser prior to registering for courses.

Lower Division

Freshman-Sophomore level courses
(may be taken at a community college)

Computer Graphics (ME 26 GME 66)
Engineering Mechanics: Statistics (CE 20)
C++ and FORTRAN 77 Programming (ECE 70
or CE 110)

Chemistry, Mathematics, Biology, and Physics
(see catalog)

Physical Geology (EES 1)

Principles of Electrical Circuits (ECE 91)
Introduction to Civil Engineering (CE 85)
Engineering Surveying (GME 15 and 15L)

Upper Division

Junior-Senior level courses
(to be taken at Fresno State)

Civil Engineering Hydraulics and Laboratory
(CE 128, 129)

Civil Engineering Practice (CE 185)

Computer Applications in Civil Engineering
(CE 110)

Concrete Laboratory (CE 124)

Engineering Economy (CE 161)

Engineering Mechanics: Dynamics (ME 112)

Engineering Writing

Environmental Engineering (CE 142 and 142L)

Mechanics of Materials and Laboratory
(CE 121, 121L)

Reinforced Concrete Design (CE 132)

Senior Project (CE 180A, 180B)

Soil Engineering and Laboratory (CE 123,
123L)

Theory of Structures (CE 130)

Transportation Planning and Design (CE 150)

Design of Steel Structures (CE 133)

Technical Area Courses

Design of Timber Structures (CE 136)

Design of Water Quality Control Processes
(CE 144)

Foundation Design (CE 134)

Geotechnical Engineering Design (CE 125)

Hydrology (CE 140)

Intermediate Theory of Structures (CE 131)

Pavement Design (CE 151)

Seismic Design of Building Structures (CE 137)

Transportation Engineering Materials (CE 152)

Traffic Operations and Control (CE 153)

Water Resources Engineering (CE 141)

Urban Stormwater Management (CE 146)

**For additional
information, write**

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PLEASE NOTE: This document is for general informational purposes only. The information is subject to change; consult the appropriate department or an academic adviser. Entering freshmen must follow the revised General Education program effective fall 1999 and thereafter. The university catalog and schedule of courses are available online at www.fresnostate.edu/ClassSchedule and www.fresnostate.edu/catalog.

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