Bachelor of Science in Civil Engineering

Civil engineers design, construct, operate and maintain the physical fabric of society. In doing so, civil engineers work toward continuous improvement of the human condition and natural environment, tackling many of the grand challenges that face humankind today. Much of the work of civil engineers is highly visible, such as roadways, bridges, airports, levees, buildings, bike paths, and city parks, while other parts are rarely seen but equally vital to the health of communities, such as the water and wastewater treatment, distribution, and collection systems or the energy infrastructure. Civil engineers keep human beings safe by designing resilient infrastructure that does not fail in extraordinary events, but that is also socially, economically, and environmentally sustainable.

The civil engineering student has the opportunity to obtain a broad background in mathematics and the physical sciences and their applications to all areas of civil engineering. This flexible curriculum allows the student to elect 18 semester hours of approved technical coursework to emphasize the areas of civil engineering of most interest to the student. In addition, courses in the humanities and social sciences are included.

To excel as a civil engineer, a student should have an aptitude for mathematics and science, an interest in the practical application of technical knowledge to societal problems, the motivation to study and prepare for engineering practice, the desire to be a professional, and a desire to work with others to better the lives of humankind. Civil engineering graduates of the University may seek a wide variety of positions in planning, design, and construction with government agencies, industry, and private consulting firms. Those who plan to pursue graduate work in engineering, or in other professions such as business, medicine, law, or journalism, have an excellent base on which to build.

Student Outcomes

Graduates of the civil engineering program should attain the following outcomes:

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- 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
- An ability to communicate effectively with a range of audiences
- 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
- 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
- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Program Educational Objectives

Graduates of the civil engineering program should solve civil engineering problems within a greater societal context. They should:

- Exhibit character and decision-making skills embodying professionalism and ethical behavior
- Apply knowledge, strong reasoning, and quantitative skills to design and implement creative and sustainable solutions
- Engage in lifelong learning to meet evolving engineering challenges facing society
- Exhibit strong communication, critical thinking, interpersonal, and management skills as leaders and contributors in the civil engineering profession

Portable Computing Devices

Students entering Civil Engineering are required to have a laptop at their disposal. Laptops do not need to be brought to campus on a daily basis, but individual courses may require that a laptop be brought to class or lab sessions. For a list of minimum system requirements see: www.caee.utexas.edu/students/itss.

Curriculum †

Requirements		Hours
Civil Engineering Courses		
C E 301	Civil Engineering Systems	3
C E 311K	Introduction to Computer Methods	3
C E 311S	Probability and Statistics for Civil Engineers	3
C E 319F	Elementary Mechanics of Fluids	3
C E 321	Transportation Systems	3
C E 324P	Properties and Behavior of Engineering Materials	3
C E 329	Structural Analysis	3
C E 341	Introduction to Environmental Engineering	3
C E 356	Elements of Hydraulic Engineering	3
C E 357	Geotechnical Engineering	3
C E 370P	Engineering Professionalism	3
Architectural Engineering		
ARE 217	Computer-Aided Design and Graphics	2
ARE 323K	Project Management and Economics	3
Chemistry		
CH 301	Principles of Chemistry I [030]	3
CH 302	Principles of Chemistry II [030]	3
Engineering Mechanics		
E M 306	Statics	3
E M 319	Mechanics of Solids	3
Mathematics		
M 408C	Differential and Integral Calculus	4
M 408D	Sequences, Series, and Multivariable Calculus	4
M 427J	Differential Equations with Linear Algebra	4
Physics		

PHY 105M	Laboratory For Physics 302K, 303K, and 317K	1
PHY 105N	Laboratory For Physics 302L, 303L, and 317L	1
PHY 303K	Engineering Physics I [093]	3
PHY 303L	Engineering Physics II	3
Other Required Courses		
E M 311M	Dynamics	3
or M E 310T	Applied Thermodynamics	
E S 333T	Engineering Communication	3
Approved science elective		3
Technical Electives		18
Remaining Core Curriculum Courses		
RHE 306	Rhetoric and Writing [010]	3
E 316L	British Literature [040]	3
or E 316M	American Literature	
or E 316N	World Literature	
or E 316P	Masterworks of Literature	
American and Texas government [070]		6
American history [060]		6
Social and behavioral science [080]		3
Visual and performing arts [050]		3
UGS 302	First-Year Signature Course [090]	3
or UGS 303	First-Year Signature Course	
Total Hours		**124**

Technical Electives

The civil engineering curriculum does not require the student to declare a specific technical area option. However, for the guidance of students with particular interests, technical electives in civil engineering are listed in areas of specialization. The 18 semester hours of technical electives must be chosen from the following civil engineering and architectural engineering courses; in special cases, with the written permission of the department chair, this requirement may be relaxed, provided the student demonstrates in advance that the courses to be substituted for civil engineering or architectural engineering courses are part of a consistent educational plan. To provide a broad general background, at least one technical elective from each of three different areas of specialization must be included in each student's program.

One, three hour course, from the approved list of math/science/engineering electives may be substituted for a technical elective. This course does not count towards the three different area breadth requirements. The current approved list is available in the departmental undergraduate office.

The following lists reflect current course offerings and are subject to change by the faculty. Current lists are available in the departmental undergraduate office.

Construction Engineering and Project Management
Architectural Engineering 335, Materials and Methods of Building Construction
Architectural Engineering 358, *Cost Estimating in Building Construction*
Architectural Engineering 366, *Contracts, Liability, and Ethics*
Architectural Engineering 376, *Building Information Modeling for Capital Projects*

Infrastructure Materials Engineering
Civil Engineering 351, *Concrete Materials*
Civil Engineering 366K, *Design of Bituminous Mixtures*

Environmental Engineering
Civil Engineering 342, *Water and Wastewater Treatment Engineering*
Civil Engineering 346, *Solid Waste Engineering and Management*
Civil Engineering 364, *Design of Wastewater and Water Treatment Facilities*
Civil Engineering 369L, *Air Pollution Engineering*
Civil Engineering 369R, *Indoor Air Quality*
Civil Engineering 370K, *Environmental Sampling and Analysis*

Geotechnical Engineering
Civil Engineering 360K, *Foundation Engineering*
Civil Engineering 375, *Earth Slopes and Retaining Structures*

Structural Engineering
Architectural Engineering 345K, *Masonry Engineering*
Architectural Engineering 362L, *Structural Design in Wood*
Civil Engineering 331, *Reinforced Concrete Design*
Civil Engineering 335, *Elements of Steel Design*
Civil Engineering 362M, *Advanced Reinforced Concrete Design*
Civil Engineering 362N, *Advanced Steel Design*
Civil Engineering 363, *Advanced Structural Analysis*

Transportation Engineering
Civil Engineering 367G, *Design and Evaluation of Ground-Based Transportation Systems*
Civil Engineering 367P, *Pavement Design and Performance*
Civil Engineering 367T, *Traffic Engineering*
Civil Engineering 367R, *Optimization Techniques for Transportation Engineers*

Water Resources Engineering
Civil Engineering 358, *Introductory Ocean Engineering*
Civil Engineering 374K, *Hydrology*
Civil Engineering 374N, *Topics in Natural Water Systems Engineering*
Civil Engineering 374U, *Topics in Urban Water Systems Engineering*

Core Component Areas: [010] Communication; [020] Mathematics; [030] Natural Science and Technology, Part I; [040] Humanities; [050] Visual and Performing Arts; [060] U.S. History; [070] American and Texas Government; [080] Social and Behavioral Sciences; [090] First-Year Signature Course; [093] Natural Science and Technology, Part II

† Effective April 2025, UT Austin no longer requires Skills and Experience flags.