



## Program Requirements

*Licensure: This program meets the educational requirements designed to lead to an occupationally required professional license or certificate in the state of Utah. Students pursuing occupations requiring a license or certificate in a state other than Utah should contact the appropriate BYU academic advisement center as well as the licensing agency in the state where they intend to work to seek information and guidance regarding licensure and certification requirements.*

*No more than 9 credit hours of grades below C- in major courses may be applied toward graduation.*

### Requirement 1 — Complete 2 Requirements

#### Requirement 1.1 — Complete 36 hours

CCE 101 - Intro to CE/Construction 1.0  
CCE 103 - Engineering Mechanics-Statics 3.0  
CCE 170 - Computer Methods 3.0  
CCE 201 - Sustainable Infrastructure 2.0  
CCE 203 - Engr Mechanics - Materials 3.0  
CCE 214 - Geomatics 3.0  
CCE 306 - Concrete, Masonry, & Asphalt 1.5  
CE 200A - Civil Engr Seminar 0.5  
CE 200B - Civil Engr Seminar 0.5  
CE 300A - Civil Engr Seminar 0.5  
CE 300B - Civil Engr Seminar 0.5  
CE 304 - Metals, Woods, & Composites 1.5  
CE 321 - Structural Analysis 3.0  
CE 332 - Hydraulics & Fluid Flow Theory 3.0  
CE 341 - Soil Mechanics 3.0  
CE 351 - Intro to Environmental Eng 3.0  
CE 361 - Intro to Transportation Engr 3.0  
CE 400A - Civil Engr Seminar 0.5  
CE 400B - Civil Engr Seminar 0.5

#### Requirement 1.2 — Complete 1 of 2 Courses

CCE 112 - Engr Draft w/CAD Apps 3.0  
CCE 113 - Construction Modeling 3.0

*Students are to enroll in seminar each Fall/Winter semester once declared in the CE major, starting with 200A/B until they have completed 400A/B.*

*Transfer students should start with 200A/B, then meet with the department academic advisor for future placement.*

#### Requirement 2 — Complete 1 Course

CE 471 - Civil Engineering Practice 1.0

#### Requirement 3 — Complete 1 of 2 Options

##### Option 3.1 — Complete 2 Courses

MATH 302 - Math for Engr 1 4.0  
MATH 303 - Math for Engineering 2 4.0  
Option 3.2 — Complete 4 Courses  
MATH 213 - Elementary Linear Algebra 2.0  
MATH 215 - Computational Linear Algebra 1.0  
MATH 314 - Calculus of Several Variables 3.0  
MATH 334 - Ordinary Differential Equation 3.0

#### Requirement 4 — Complete 7 Courses

*Supporting courses:*

CHEM 105 - Gen College Chem 1+Lab Integr 4.0  
GEOL 330 - Geology for Engineers 3.0  
MATH 112 - Calculus 1 4.0  
MATH 113 - Calculus 2 4.0  
PHSCS 121 - Intro to Newtonian Mechanics 3.0  
STAT 201 - Stat for Engineers & Scientist 3.0  
WRTG 316 - Technical Communication 3.0

#### Requirement 5 — Complete 1 of 2 Courses

CCE 231 - Global Leadership 3.0

#### Requirement 6 — Complete 1 of 2 Courses

*Culminating design courses (technical elective):*

CE 439 - Water Resources Study Abroad 3.0  
CE 472 - Civil Engineering Design 3.0

#### Requirement 7 — Complete 9 hours

*Technical Electives: Complete 9 additional technical elective credits from the following (NOTE: a course taken as a major requirement course may not double count as a technical elective course):*

CE 414 - Engr Applications of GIS 3.0  
CE 421 - Structural Steel Design 3.0  
CE 424 - Reinforced Concrete Design 3.0  
CE 431 - Hydrology 3.0  
CE 433 - Hydraulic Engineering 3.0  
CE 439 - Water Resources Study Abroad 3.0  
CE 442 - Foundation Engineering 3.0  
CE 461 - Geometric Design of Highways 3.0  
CE 472 - Civil Engineering Design 3.0  
CE 495R - Global Projects - *You may take once 0.5v*  
CE 500 - Design & Materials Applicatns 3.0  
CE 501 - Stress Analysis & Design 3.0  
CE 504 - Computer Struc Optimization 3.0  
CE 505 - Port Cement Design & Analysis 3.0  
CE 507 - Linear Finite Element Methods 3.0  
CE 508 - Structural Vibrations 3.0  
CE 514 - Geospatial Software Dev 3.0  
CE 521 - Adv Structural Steel Design 3.0  
CE 525 - Bridge Structures 3.0  
CE 526 - Bridge Preservation 1.5  
CE 528 - Masonry Design 3.0  
CE 529 - Structural Wood Design 3.0  
CE 531 - Hydrologic Modeling 3.0  
CE 533 - Adv. Hydraulic Routing 3.0  
CE 534 - Hydroinformatics 3.0  
CE 535 - Hydraulic Design of Channels 3.0  
CE 540 - Geo-Environmental Engineering 3.0  
CE 542 - Deep Foundations 3.0  
CE 543 - Chemical Stabilization 1.5  
CE 544 - Seepage & Slope Stability 3.0  
CE 545 - Geotech Analysis of Earthquake 3.0  
CE 547 - Groundwater Modeling 3.0  
CE 551 - Water Treatment Fac Design 3.0  
CE 555 - Environmental Chemistry 3.0  
CE 562 - Traffic Engineering 3.0  
CE 563 - Pavement Design 3.0  
CE 565 - Urban Transportation Planning 3.0  
CE 566 - Pavement Management 3.0  
CE 568 - Asphalt Mixture Design 1.5  
CE 570 - CAE Software Development 3.0  
CE 575 - Optimization Techniques 3.0  
CE 580 - Technical Writing 1.5  
CE 594R - Selected Problems in CE - *You may take up to 9.0 credit hours 1.0v*

#### Requirement 8 — Complete 2 of 5 Options

##### Option 8.1 — Complete 1 of 2 Courses

CE 421 - Structural Steel Design 3.0  
CE 424 - Reinforced Concrete Design 3.0

##### Option 8.2 — Complete 1 of 2 Courses

CE 431 - Hydrology 3.0  
CE 433 - Hydraulic Engineering 3.0

##### Option 8.3 — Complete 1 Course

CE 442 - Foundation Engineering 3.0

##### Option 8.4 — Complete 1 Course

CE 461 - Geometric Design of Highways 3.0

##### Option 8.5 — Complete 1 Course

CE 551 - Water Treatment Fac Design 3.0

## THE DISCIPLINE:

The BYU Civil Engineering discipline prepares students for professional involvement in structural, water resources, environmental, geotechnical (soils), and transportation engineering. Structural engineers analyze and design buildings, bridges, and other structures. The engineer applies principles of physics, mathematics, and engineering to develop efficient yet safe designs. Sophisticated computer models are used in these analyses. Materials used by structural engineers include steel, aluminum, concrete, masonry, wood, and composites. Water resource and environmental engineers design pipeline systems, water treatment plants, dams, flood control structures, waste disposal sites, and environmental restoration projects.

Computer modeling and analyses are used in design and to forecast storm runoff, flooding, and movement of contaminants in surface and subsurface waters. Environmental engineers evaluate and reduce pollutants from natural, human, agricultural, and industrial sources to preserve the beauty and quality of air, land, and water.

Geotechnical engineers design structures composed of or located within earth materials, including foundations for buildings and bridges, retaining walls, earth dams, highway embankments, tunnels, and liners for landfills. Field and laboratory tests on soil and rock along with empirical and computer models are used to assure safety and economy in design. Traffic and transportation engineers apply scientific principles to the planning, design, construction, operation, and management of transportation systems, including highways, railroads, airports, and mass transit facilities.

Transportation engineers are responsible for the safe, rapid, comfortable, convenient, economical, and environmentally compatible movement of people and goods. Computer models and simulations are used by traffic engineers for geometric design and for planning, operating, and managing transportation networks, including intermodal systems.

## STUDENT CHAPTER:

The BYU Student Chapter of the American Society of Civil Engineers is one of the nation's most active and successful chapters. The Chapter has received the Ridgway Award as the nation's top chapter 8 times. Through participation in the chapter, students have an opportunity to learn about the broad spectrum of civil engineering opportunities. They may also participate in chapter community service projects, which include the construction of bridges, parks, and other aids to communities in the area. Besides the well-established BYU ASCE Student Chapter, the department has two transportation focused student chapters: The BYU Institute of Transportation Engineers (ITE) Student Chapter and the BYU American Railway Engineering and Maintenance-of-Way Association (AREMA) Student Chapter. Through the activities of these two chapters, students are able to meet with professional engineers and their potential future employers in their monthly meetings, associate with students who have the same career goals, learn from invited speakers and have opportunities to do service projects in the community.

**FINANCIAL ASSISTANCE:**

In addition to university scholarships, the department awards many part-tuition scholarships, largely to upper division and graduate students. To apply, visit [ceen.byu.edu/scholarships](http://ceen.byu.edu/scholarships).

Teaching and research assistantships are available in the department, largely for upperdivision and graduate students.

**CAREERS:**

Civil engineers are employed in industry, private consulting, and government. Industries employing many civil and environmental engineers include construction, transportation, aerospace, petroleum, and mining.

Many civil engineers enter private consulting practices, and many eventually establish their own firms.

Civil engineers are also employed by national, state, and local governments. Most cities and counties have engineering departments staffed largely by civil engineers. Departments of transportation, environmental protection agencies, the Army Corps of Engineers, and the Bureau of Reclamation hire many civil engineers.

Civil engineering may be used as a preprofessional program for careers in architecture, law, and business.

**PROFESSIONAL ENGINEERING REGISTRATION:**

Because civil engineers design structures that affect public health and safety, licensure as a Professional Engineer is required for most positions. A necessary prerequisite for licensure is graduation from an accredited engineering program. The BYU Civil Engineering program is currently accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org/>.

During the senior year, students are encouraged to take the Fundamentals of Engineering Exam. This exam is the first step in registration as a Professional Engineer, a mark of competence and professional stature.

**MAIN SUBDISCIPLINE AREAS:**

Structures: Includes structural design of buildings and bridges, seismic design of structures, structural optimization, and numerical methods for structural analysis.

Water resources and environmental: Includes industrial and hazardous waste control, hazardous waste site remediation, water and wastewater treatment, water quality management, computer-based analyses and design of water and wastewater systems, satellite hydrology, hydro-informatics, open channel flow, and sustainable design of hydraulic structures and systems.

Geotechnical : Includes soils as engineered systems, foundation and embankments, ground response to earthquakes, liquefaction, collapsible soils, and soil improvement techniques.

Transportation: Includes transportation systems and planning, geometric highway design, traffic operations and safety, highway materials, and pavement design.

**MAP DISCLAIMER**

While every reasonable effort is made to ensure accuracy, there are some student populations that could have exceptions to listed requirements. Please refer to the university catalog and your college advisement center/department for complete guidelines.

**DEPARTMENT INFORMATION****Civil and Construction Engineering**

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430 Engineering Building  
Provo, UT 84602  
Telephone: 801-422-2811  
Web: <http://cce.byu.edu>  
Email: [cce@byu.edu](mailto:cce@byu.edu)

**ADVISEMENT CENTER INFORMATION****Engineering Advisement Center**

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246 Engineering Building  
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