Civil Engineering (ECE)

Bachelor of Science in Civil Engineering (B.S.C.E.)

131 Credit Hours

CIP Code: 14.0801

College of Engineering

http://www.usf.edu/engineering/undergraduate/majors.aspx

Major Description

Civil engineers will be entrusted by society to create a sustainable world and enhance the global quality of life. Civil engineers will serve as master planners, designers, constructors, and operators of society’s economic and social engine, the built environment (i.e., infrastructure); innovators and integrators of ideas and technology across the public, private, and academic sectors; managers of risk and uncertainty caused by natural events, accidents, and other threats; stewards of the natural environment and its resources; and, leaders in discussions and decisions shaping public environmental and infrastructure policy.

Mission Statement

The Bachelor of Science in Civil Engineering in the Department of Civil and Environmental Engineering at the University of South Florida will provide undergraduate students with strong, broad-based, engineering education which gives them the basic intellectual and organization skills that allow them to work with complex systems with technological, social and environmental components.

As many of the major's graduates begin work upon graduation in industry or with governmental organizations, the curriculum is designed to prepare students for these roles by requiring a number of courses in the various fields of civil engineering and by providing limited specialization in one given area. The curriculum is designed to encourage lifelong learning and to prepare students for undertaking advanced studies in engineering or in other professional areas.

Major Educational Objectives

The Civil Engineering major and curriculum of the Department of Civil and Environmental Engineering are designed to meet the needs of all students within the context of the Major's Mission Statement. The Major Educational Objectives associated with the Major's Mission Statement are:

1. Graduates, within 3-6 years after graduation, can obtain positions in both public and private organizations.
2. Graduates, within 3 to 6 years after graduation, are continuing their professional development by extending their professional knowledge through independent learning, continuing education courses, conferences, workshops, short courses, graduate study and involvement in professional societies.
3. Graduates, within 3 to 6 years after graduation, who are working in public or private organizations which encourage professional registration, will have made appropriate progress towards achieving that registration.

Please refer to the mission statement on the department website for additional information.
Entrance and Continuation Requirements for the Civil Engineering Major

College of Engineering students who have fully met the below admission requirements and are in good academic standing, may declare a major in Civil Engineering. Prior to being admitted to a department, a student may be permitted to take no more than two departmental engineering courses. Once admitted, the Department may have continuation requirements which specify minimum performance standards in core engineering courses which must be met before further registration in the Department is granted.

Minimum Admission Requirements for the Civil Engineering Department

1. Completion of:
   o Calculus I (MAC 2311 or MAC 2281) and Calculus II (MAC 2312 or MAC 2282) and Calculus III (MAC 2313 or MAC 2283)
   o Calculus-based Physics I with Lab (PHY 2048 and PHY 2048L)
   o Calculus-based Physics II with Lab (PHY 2049 and PHY 2049L)
   o General Chemistry I with Lab (CHM 2045 and CHM 2045L) or (CHS 2440 and CHS 2440L)

   with a minimum grade of a C in each course and a 3.0 GPA (based on best attempt) in these prerequisites

2. A minimum overall GPA of 2.0
3. A minimum USF GPA of 2.0

Minimum Continuation Requirements for the Civil Engineering Department

Continuation requires a minimum grade of C- as well as a 2.5 GPA (based on best attempt) for the following courses:

- EGN 3311 Statics
- EGN 3331 Mechanics of Materials
- EGN 3353 Basic Fluid Mechanics
- EGN 3365 Materials

GPA and Grade Requirements

A total of only two D grades are allowed in all BSCE required engineering, and most specialization courses. The Department of Civil and Environmental Engineering must be contacted to find out the specialization courses in which D grades are not allowed. Students must have and maintain a minimum 2.0 Engineering GPA, 2.0 Specialization GPA, 2.0 USF GPA, 2.0 Overall GPA, and 2.5 Continuation GPA. Unless otherwise stated, the minimum acceptable grade in all BSCE required courses is a C- or higher.

A total of only two D grades are allowed in all BSCE required engineering, and most specialization courses. Students cannot graduate with Ds in the following list of courses that correspond to their track (specialty):

- Geotech/Trans track: Mechanics of Materials, Geotech I, Geotech II, Trans I, Trans II and Capstone Design (CEG 4850)
Students must have and maintain a minimum, 2.0 Engineering GPA, 2.0 Specialization GPA, 2.0 USF GPA, 2.0 Overall GPA, and 2.5 Continuation GPA.

Tracks

In addition to designated common coursework in engineering mechanics, civil, and environmental engineering, students undertake a concentration of 18 hours of coursework plus a 3-hour capstone design course and a 1 hour Professional and Ethical Issues in Engineering. These courses are based on the student's choice of track.

Departmental Policies

In addition to the College’s graduation requirements, the department has the following policies:

- All students must participate in mandatory advising prior to each term.
- All students must participate in department assessment activities and successfully complete an exit interview before graduating.
- All students must consider the advice of the Department to complete and pass the Fundamentals of Engineering Exam (F.E. Exam).
- All students must periodically provide writing samples as part of the department’s writing assessment program.

Limited Access - This major has additional admissions requirements as listed in this section.

Empty

State Mandated Common Course Prerequisites

Students wishing to transfer to USF should complete an A.A. degree at a Florida College System institution. Some courses required for the major may also meet General Education requirements thereby transferring maximum hours to the university.

If a student wishes to transfer without an A.A. degree and has fewer than 60 semester hours of acceptable credit, the student must meet the university’s entering freshman requirements including ACT or SAT test scores, GPA, and course requirements.

Transfer students are also required to comply with the immunization, foreign language, and continuous enrollment policies of the university.

Students should complete the following prerequisite courses at the lower level prior to entering the university. If these courses are not taken at a Florida College System institution, they must be completed before the degree is granted.

Unless stated otherwise, a grade of C is the minimum acceptable grade in prerequisite courses.

Students qualify for direct entry to their intended department if they have completed the following courses at a Florida College System institution or University in the Florida State University System (SUS) and meet all of the other admissions requirements of the University and College.

The following are transferable courses from a Florida College System institution that will be accepted in the Math/Science/Engineering areas:

**Mathematics:**

Courses at USF

Courses at a Florida College System Institution

MAC 2281 Engineering Calculus IMAC X311 or MAC X281MAC 2282 Engineering Calculus IIIMAC X312 or MAC X282MAC 2283 Engineering Calculus IIIIMAC X313 or MAC X283MAP 2302 Differential Equations MAP X302 or MAP X305

**Natural Sciences:**

Courses at USF

Courses at a Florida College System Institution

CHM 2045/CHM 2045L General Chemistry I with LabCHM X045/X045L or CHM X045C or CHS 2440/CHS 2440L General Chemistry for Engineers with LabCHS X440/X440LPHY 2048/PHY 2048L General Physics I - Calculus Based with LabPHY X048/X048L or PHY X048C or PHY X043/X048L
PHY 2049/PHY 2049L General Physics II - Calculus Based with LabPHY X049/X049L or PHY X049C or PHY X044/X049L
Required Supporting Courses for the Major - 0 Hours

Empty

Total Major Hours - **140.117** Hours

Major Core Information

Empty

Major Core Courses (**140.117** Hours):

**Math and Science (27 credit hours)**

- MAC 2281 Engineering Calculus I or MAC 2311 Calculus I
- MAC 2282 Engineering Calculus II or MAC 2312 Calculus II
- MAC 2283 Engineering Calculus III or MAC 2313 Calculus III
- MAP 2302 Differential Equations or EGN 3433 Modeling and Analysis of Engineering Systems
- CHS 2440 General Chemistry for Engineers or CHM 2045 General Chemistry I
- CHS 2440L General Chemistry for Engineers Laboratory or CHM 2045L General Chemistry I Laboratory
- PHY 2048 General Physics I
- PHY 2048L General Physics I Laboratory
- PHY 2049 General Physics II
- PHY 2049L General Physics II Laboratory

**Basic Engineering (28 credit hours)**

- EGN 3000 Foundations of Engineering
- EGN 3000L Foundations of Engineering lab (Creative Thinking)
- GLY 3850 Geology for Engineers
- EGN 1113 Introduction to Design Graphics
- EGN 3321 Dynamics
- EGN 4453 Numerical and Computer Tools I in Civil & Environmental Engineering
- EGN 3331L Mechanics of Materials Laboratory
- EGN 3343 Thermodynamics
- EGN 3443 Probability and Statistics for Engineers (Information & Data Literacy)
- EGN 3615 Engineering Economics with Social and Global Implications (Human & Cultural Diversity)
- EGN 3373 Introduction to Electrical Systems I

**Continuation Courses (12 credit hours)**

- EGN 3311 Statics
- EGN 3365 Materials Engineering
- EGN 3331 Mechanics of Materials
- EGN 3353 Basic Fluid Mechanics

**Specialization (26 credit hours)**

- EGN 4454 Numerical and Computer Tools II in Civil & Environmental Engineering
- ENV 4001 Environmental Systems Engineering
- TTE 4004 Transportation Engineering I
- CES 3102 Structures I
- CWR 4202 Hydraulics
- ENV 4004L Environmental/Hydraulics Engineering Lab
- CEG 4011 Geotechnical Engineering I
- CEG 4011L Geotechnical/Transportation Laboratory
- CGN 3021L Civil Engineering Lab (*pending change in credit hours to 3*)
- CGN 4122 Professional and Ethical Issues in Engineering (HIP ERCE) (*pending change in credit hours to 3*) (HIP ERCE)

Technical Writing (3 credit hours)

- ENC 3246 Communications for Engineers

Capstone Design (3 credit hours) (HIP)

- Structures/Materials/Geotechnical Track: CES 4750 Capstone Structural/Geotechnical/Material Design
- Geotechnical/Transportation Track: CEG 4850 Capstone Geotechnical/Transportation Design
- Environmental/Water Resources Track: CWR 4812 Capstone Water Resources/Environmental Design

Civil Engineering Track (18 credits) and Capstone Design Requirements

Civil Engineering students choose one of the three tracks listed below:

- **Structures/Materials/Geotechnical Track**
  - CES 4702 Concepts of Concrete Design
  - CES 4605 Concepts of Steel Design
  - CGN 4851 Concrete Construction Materials
  - CEG 4012 Geotechnical Engineering II or TTE 4005 Transportation Engineering II
  - Technical Elective (six credit hours total, from the approved list of courses)
  - CES 4750 Capstone Structural/Geotechnical/Material Design (HIP)

- **Geotechnical/Transportation Track**
  - CGN 4851 Concrete Construction Materials
  - CEG 4012 Geotechnical Engineering II
  - TTE 4005 Transportation Engineering II
  - Technical Elective (nine credit hours total, from the approved list of courses)
  - CEG 4850 Capstone Geotechnical/Transportation Design (HIP)

- **Environmental/Water Resources Track**
  - ENV 4417 Water Quality and Treatment
  - CWR 4540 Water Resources Engineering I
  - CEG 4012 Geotechnical Engineering II or TTE 4005 Transportation Engineering II
  - Technical Elective (nine credit hours total, from the approved list of courses)
  - CWR 4812 Capstone Water Resources/Environmental Design (HIP)

**Major Elective Information**

- Empty

**Major Elective Courses (0 Hours):**

- Empty
Additional Major Requirements

Entrance Requirements for the Civil Engineering Department

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- All students must periodically provide writing samples as part of the department’s writing assessment program.

GPA Requirement

Students must have and maintain a minimum, 2.0 Engineering GPA, 2.0 Specialization GPA, 2.0 USF GPA, 2.0 Overall GPA, and 2.5 Continuation GPA.

Course Grade Requirement

Grade Requirement

A total of only two D grades are allowed in all BSCE required engineering, and most specialization courses. The Department of Civil and Environmental Engineering must be contacted to find out the specialization courses in which D grades are not allowed.

Residency Requirement

Transfer students must complete a minimum number of approved specialization courses in the major at USF. The minimum number of USF specialization credit hours required is established by the respective academic department. In no case will this be less than 18 hours. Basic engineering courses are not considered specialization courses. The University residency requirement must also be met.

A dual degree student must meet the requirements of each major and have a minimum of 18 approved specialization hours taken in the degree granting department beyond those specialization hours required for the first degree.

Foreign Language Requirement

Empty

Gordon Rule Requirement

The State Communication Requirement (formerly known as Gordon Rule Writing) and State Computation Requirement (formerly known as Gordon Rule Math) is fully met through the courses required for the major or by completing an AA degree at a Florida College System institution.

Foundations of Knowledge and Learning (FKL) Requirement

The math and science courses required for this major fully meet the math and science requirements of the Foundations of Knowledge and Learning core curriculum.

Students in the College of Engineering may substitute a second "Physical Science" course for the required "Life Science" course. The credits earned for chemistry required by this major may count toward the FKL science requirement.

Foundations of Knowledge and Learning (FKL) Exit Requirement

- ENC 3246 Communication for Engineers (WRIN)
- CES 4750 Capstone Structural/Geotechnical/Material Design (CPST) or CEG 4850 Capstone Geotechnical/Transportation Design (CPST) or CWR 4812 Capstone Water Resources/Environmental Design (CPST).
Research Opportunities

If left blank, this field will automatically be populated with the following statement:

All undergraduate students in any degree program can participate in undergraduate research. There are a number of options to receive academic credit for a mentored research experience and to have the experience show on the official transcript. Students who wish to enroll in an undergraduate research course should consult with their academic advisor to understand how the credit will apply towards the degree requirements. If no credit is needed, students may be eligible to enroll in the 0-credit IDS 2912, IDS 4914 or IDH 4910 courses. These courses will not impact degree credits or GPA but will show on an official transcript and document the experience. The Office for Undergraduate Research will assist students in understanding the various course options.

The Research Experiences for Undergraduate Students program in the USF College of Engineering offers undergraduate students an opportunity to directly participate in state-of-the-art research. Graduate students and professors serve as research partners and mentors as undergraduate research assistants participate in the scientific process and gain relevant experience.

There are a number of options to receive academic credit for a mentored research experience and to have the experience show on the official transcript. Students who wish to enroll in an undergraduate research course should consult with their academic advisor to understand how the credit will apply towards the degree requirements. If no credit is needed, students may be eligible to enroll in the 0-credit IDS 2912, IDS 4914 or IDH 4910 courses. These courses will not impact degree credits or GPA but will show on an official transcript and document the experience.

Internship Opportunities

The College of Engineering and USF’s Career Services Cooperative Education (Co-Op) program provides services for students interested in experiential educational experiences. A wide variety of industries and government agencies offer internships and cooperative education employment opportunities for engineering students. Participants gain valuable expertise in practical applications and other aspects of operations and development in a professional engineering environment. Students normally apply for participation in this program during their first year in the College of Engineering and pursue actual internships during their sophomore, junior and senior years.

Optional Honors Program

Empty

Coursework:

Empty

Optional Accelerated Program
Additional Major Information

Advising

All incoming freshman and transfer students must meet with one of the college advisors in the Engineering Student Services (ESS).

Engineering Student Services
Office: Engineering Building III (ENC) 1302
Phone: (813) 974-2684
Email: eng-advisingmail@usf.edu
Website

Students who have completed the entrance requirements and are accepted into the major: http://www.usf.edu/engineering/cee/about-us/contact-us.aspx.

Contact:

Empty

Faculty


Accreditation

The Bachelor of Science degree in Civil Engineering is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

Other Information

Empty