**Civil Engineering**

**Master of Civil Engineering (M.C.E.) Degree**

**DEGREE INFORMATION**

**Priority Admission Application Deadlines:**

**Fall:** February 15

**Spring:**  October 15

**Summer:**  February 15

International applicant deadlines:

<http://www.grad.usf.edu/majors>

**Minimum Total Hours:** 30

**Level:** Masters

**CIP Code:** 14.0801

**Dept. Code:** EGX

**Major/College Codes:** ECE EN

**Approved:** 1983

**Concentrations:**

Geotechnical Engineering

Materials Engineering and Science

Structures Engineering

Transportation Engineering

Water Resources

**Also offered as an Accelerated Degree Program**

Civil Engineering (BSCE/MCE)

**CONTACT INFORMATION**

**College:** Engineering

**Department:** Civil and Environmental Engineering

**Contact Information:** [www.grad.usf.edu](http://www.grad.usf.edu/)

**MAJOR INFORMATION**

The field of Civil Engineering has long been known for its breadth and ability to adapt to the new technological needs of society. The traditional areas of public works, such as highways, bridges, water supply, building design, and wastewater treatment, remain very important. In addition, the modern area of managing the environment has been included in the Civil Engineering domain. Graduates of the majors are prepared for careers with public agencies or private industry and firms involved in planning, design, research and development, or regulation.

The Department has a high bay structures laboratory, which includes an MTS 250 kip testing machine. There are also well-equipped environmental, soils, pavement and hydraulics laboratories. These laboratories include equipment such as an ion chromatograph, atomic absorption spectrometer, environmental chamber, constant rate of stress consolidometer, triaxial units and superpave testing equipment.

The M.C.E. degree provides a student with the opportunity to earn the advanced degree by coursework only. This degrees is recommended for part-time students who find it difficult to do thesis research because of their work commitment or for those who wish to complete degree requirements quickly. Many of the department's graduate courses are offered online or on weekday evenings, which permits working students the opportunity to seek a graduate degree.

**ADMISSION INFORMATION**

Must meet University requirements (see Graduate Admissions) as well as requirements for admission to the major, listed below.

* + Undergraduate GPA ≥ 3.0 preferred.
  + GRE with preferred minimum scores of V 145 (25th percentile), Q 155 (60th percentile), AW 3.0 (15th percentile); or valid fundamentals of engineering (FE) or professional engineering (PE) certificate. Verification of FE or PE certification should be obtained from the PE board where the certification was obtained. See the CEE department website for more information: <http://www2.eng.usf.edu/cee/graduate/apply.htm>.
  + TOEFL (International applicants only) 79 (550 paper based exam) or IELTS 6.5 (IELTS).
* Two (2) Letters of Reference provided at the time of application.
  + Statement of Purpose provided at the time of application
  + Resume provided at the time of application.

**CURRICULUM REQUIREMENTS**

The minimum coursework requirement is 30 credit hours for students with an undergraduate engineering degree. Students without an engineering bachelor’s degree will be required to complete undergraduate engineering pre-requisite courses as determined by the Department.

**Pre-requisites – 12 hours**

All students must complete the following pre-requisites or equivalent courses:

EGN 3311 3 Statics

EGN 3343 3 Thermodynamics I

EGN 3353 3 Basic Fluid Mechanics

EGN 3615 3 Engineering Economics

Most entering students will have taken these courses (or equivalent versions) prior to admission to the M.C.E. major. Students who have not taken these courses prior to beginning the M.C.E. degree program are encouraged to do so as quickly as possible, as these may be pre-requisites for a number of graduate-level courses in the major.

**Total Minimum Hours 30 hours**

Core Courses – 3 hours

Coursework – 21 hours

Thesis – 6 hours

The minimum coursework requirement is 30 graduate level credit hours for students with an undergraduate engineering degree.  For students pursuing a concentration area (as detailed below), the 30 credit hours will include at least 15 credit hours of concentration course requirements, with remaining credit hours to consist of core coursework and technical electives as approved by the Department.  For students pursuing no concentration area, the 30 credit hours will consist wholly of core coursework and technical electives as approved by the Department, but with a minimum of 18 credit hours taken within the Department of Civil and Environmental Engineering.  Students without an engineering bachelor’s degree will be required to complete undergraduate engineering pre-requisite courses as determined by the Department.  Please contact the Graduate Director for more information.

**Concentration Requirements - 15 hours**

The Department supports M.C.E. concentration areas in Geotechnical Engineering (GTL), Materials Engineering and Science (MTL), Structures Engineering (STR), Transportation Engineering (TPT), and Water Resources (WRS). Students may select from one of these Specializations, or may select no concentration.

**Geotechnical Engineering**

CEG 5115 3 Foundation Engineering

CES 6118 3 Applied Finite Elements

9 Additional credit hours of graduate level coursework in Geotechnical engineering or closely related areas.

**Materials Engineering and Science**

At least 2 courses (6 credit hours) from the following list:

CGN 6933 3 Selected Topics: Advanced Construction Materials

CGN 6720 3 Electrochemical Diagnostic Techniques

CGN 6933 3 Selected Topics: Structural Life Prediction

EMA 5326 3 Corrosion Control

EMA 6510 3 Characterization of Materials

9 Additional credit hours of graduate level coursework in Materials Engineering and Science or closely related areas.

**Structures Engineering**

At least 1 course (3 credit hours) from the following list of design courses:

CES 6706 3 Advanced Concrete

CES 6835 3 Design of Masonry Structures

CES 5715C 3 Pre-stressed Concrete

At least 1 course (3 credit hours) from the following list of analysis courses:

CES 6118 3 Applied Finite element

CGN 6933 3 Selected Topics: Advanced Structural Mechanics

CGN 6933 3 Selected Topics: Advanced Structural Analysis

CES 5209 3 Structural Dynamics

9 Additional credit hours of graduate level coursework in Structures Engineering or closely related areas.

**Transportation Engineering**

TTE 5205 3 Traffic Systems Engineering

TTE 5501 3 Transportation Planning and Economics

TTE 6507 3 Travel Demand Modeling or CGN 6933 Selected Topics in Civil and Environmental Engineering:

Statistical and Econometric Methods

6 Additional credit hours of graduate level coursework in Transportation Engineering or closely related areas.

**Water Resources** 4 courses (12 credit hours) from the following list:

CWR 6235 3 Free Surface Flow

CWR 6239 3 Waves and Beach Protection

CWR 6305 3 Urban Hydrology

CWR 6534 3 Coastal and Estuary Modeling

CWR 6535 3 Hydrologic Models

CGN 6933 1-3 Vadose Zone Hydrology

CGN 6933 1-3 Groundwater Hydraulics

CGN 6933 1-3 Advanced Computational Fluid Mechanics

CWR 6820 3 Coastal Waves and Structures

CWR 6538 3 Advanced Hydrologic Model

CGN 6933 3 Selected Topics: Advanced Numerical Methods

CGN 6933 3 Selected Topics: Global Water Sustainability

CGN 6933 3 Selected Topics: Ecological Engineering

3 Additional graduate credit hours in Water Resources engineering or closely related areas.

**Portfolio / Comprehensive Exam**

Portfolio and oral interview are used in lieu of a comprehensive exam. The purpose of the portfolio and interview is for students to demonstrate that they have achieved a minimum level of proficiency in stipulated competencies. Specifically, by the time they graduate, students will demonstrate

* an ability to plan, compose, and integrate verbal, written, virtual, and graphical communication of a project to technical and non-technical audiences, and
* an ability to formulate and solve complex problems in Civil Engineering using relevant data and techniques.

Additional details regarding portfolio requirements will be provided to students by the Department.

**Other requirements**

* A maximum of 12 graduate level credits taken outside the CEE department may be applied to meet the degree requirements.
* A maximum of 6 credits of independent study may be applied to meet the degree requirements.

**Accelerated Major**

**Accelerated B.S.C.E. in Civil Engineering and M.C.E. in Civil Engineering**

**Description**

Students pursuing a B.S.C.E. in Civil Engineering will earn a Master of Civil Engineering in an accelerated manner by sharing 2 Civil Engineering graduate courses (6 credit hours) taken as upper-level departmental (Technical) electives as part of B.S. program.

The B.S.C.E. requires a total of 131 hours and the M.S. requires 30 hours. By sharing 6 credit hours, the total credit hours earned will be 155 hours.

This accelerated major shares six (6) credit hours between already existing degrees:

B.S.C.E in Civil Engineering

M.C.E. in Civil Engineering

Admission Requirements

For Admission to the program, a student must:

1. Have completed 15 hours in the undergraduate major
2. Have a minimum 3.33 GPA overall; and
3. Have a minimum undergraduate 3.50 GPA in the major.

Timeline and Benchmarks:

1. To be considered for acceptance into the Accelerated B.S.C.E Civil Engineering/ M.C.E. Civil Engineering major, students must have completed a minimum of 15 credit hours in the Civil Engineering undergraduate major.
2. Students must have a minimum undergraduate GPA of 3.33 overall, and a minimum GPA of 3.50 in the major.
3. Following completion of a minimum 15 hours in the undergraduate major, students may be considered for acceptance into the accelerated major through faculty nomination or student self-nomination, via submission of an Accelerated major Application Form. Both B.S.C.E and M.C.E. majors will review the applications and approve the nominations. All applications require the approval of USF’s Office of Graduate Studies, the College of Engineering’s Graduate Major, and the Department of Civil and Environmental Engineering Majors.
4. To be promoted to graduate status, students must meet all admission requirements of the M.C.E. in Civil Engineering.
5. Student must earn a minimum of a “B” (3.00) in all shared graduate courses. Failure to earn at least a “B” in a shared graduate course will result in academic review by the graduate major. Failure to maintain good standing as a graduate student will result in academic probation, according to the procedures of the USF Office of Graduate Studies.
6. A comprehensive plan of study to complete the Accelerated B.S.C.E. Civil Engineering/ M.C.E. Civil Engineering major will be developed with the guidance of undergraduate and graduate advisors.

**Shared Courses (6 credit hours)**

Students may choose two (2) of the following five (5) 6000-level course options to meet the upper-level undergraduate Technical elective requirement:

1. TTE 4005 Transportation Engineering II, satisfied by and (3 credit) 6000-level TTE prefixed graduate course.
2. CEG 4012 Geotechnical Engineering II, satisfied by and (3 credit) 6000-level CEG prefixed graduate course.
3. CWR 4812 Capstone Water Resources/Environmental Engineering Design, satisfied by ENV 6564 Environmental Engineering Design.
4. Free Technical elective, satisfied by any (3credit) 6000-level CEG, TTE, CES, CGN or CWR course.
5. Free Technical elective, satisfied by any (3credit) 6000-level CEG, TTE, CES, CGN or CWR course.

No required major or state mandated common core prerequisite undergraduate course are being replaced by any graduate courses.

\*Please see Undergraduate Catalog for major-specific requirements.

**COURSES**

See [http://ugs.usf.edu/course-inventory](http://www.ugs.usf.edu/sab/sabs.cfm)