**Civil Engineering**

**Master of Science in Civil Engineering (M.S.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:** 1981

**Concentrations:**

Engineering for International Development (EFD)

Geotechnical Engineering

Materials Engineering and Science

Structures Engineering

Transportation Engineering

Water Resources

**Also offered as an Accelerated Degree Program**

Civil Engineering (BSCE/MSCE)

**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 with 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.S.C.E. is a research-oriented degree in which the student writes, as a major part of the degree requirements, a thesis that defines, examines, and reports in depth on a subject area relevant to Civil Engineering. The purpose of the thesis is to instill in the student the ability to inspect, evaluate, and report on a subject of interest to the engineering profession.

**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.
* Two Letters of Reference provided at the time of application (three required for EFD concentration).
* Statement of Purpose provided at the time of application.
	+ Resume provided at the time of application.

Exceptions made on a case-by-case basis where warranted

**CURRICULUM REQUIREMENTS**

**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 major consists of a minimum of 24 credit hours of coursework and 6 credit hours of thesis. For students pursuing a concentration area (as detailed below), the 24 credit hours of coursework will include at least 12 credit hours of Concentration 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 24 credit hours of coursework will consist wholly of core coursework and technical electives as approved by the Department, but with a minimum of 15 credit hours taken within the Department of Civil and Environmental Engineering. Students without an Engineering undergraduate degree will be required to complete undergraduate engineering pre-requisite courses as determined by the Department. Contact the Graduate Director for more information.

**Concentration Requirements -12 hours minimum**

The Department supports M.S.C.E. concentration areas in Engineering for International Development (EFD), 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 concentrations, or may select no concentration.

**Engineering for International Development (EFD)**

This concentration acknowledges coursework and international field experience in the area of engineering for international development that considers issues of sustainable development, water, sanitation, and health (WaSH), gender, and society. This graduate concentration requires 1) coursework in global health, applied anthropology (medical, environmental, and development), and Water, Sanitation, Hygiene (WaSH) engineering, 2) a development-focused research component, and 3) a long-term overseas field experience in sustainable development as a WaSH engineer, which in most cases will form the basis of the student’s master’s thesis The international field experience allows a student to remain enrolled as a full-time student (with zero tuition/fees) and gain development experience serving with Peace Corps and Non-governmental Development Organizations. Graduates are competitive for employment in the global WaSH development field.

ENV 6510 Sustainable Development Engineering

A minimum of 1 course (3 credits) from the following applied anthropology courses:

ANG 6766 3 Research Methods in Applied Anthropology

ANG 6730 3 Socio-cultural Aspects of HIV/AIDS

ANG 6469 3 Selected Topics: Health, Illness and Culture

A minimum of one course (3 credits) from the following global public health courses:

PHC 6764 3 Global Health Principles & Contemporary Issues

PHC 6761 3 Global Health Assessment Strategies

3 additional graduate level credit hours of coursework in international development engineering or closely related areas.

Students engaged in full-time global training and/or service as part of the EFD concentration (e.g., in the U.S. Peace Corps, with a non-governmental organization, UNESCO-IHE, or equivalent) may register for CST 6990 for 0 credit hours while in their country of service/research.

**Geotechnical Engineering**

CEG 5115 Foundation Engineering

CES 6118 Applied Finite Elements

6 additional credit hours of 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 Selected Topics: Advanced Construction Materials

CGN 6720 Electrochemical Diagnostic Techniques

 CES 6010 Structural Life Prediction

EMA 5326 Corrosion Control

EMA 6510 Characterization of Materials

6 additional credit hours of 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 Advanced Concrete

CES 6835 Design of Masonry Structures

CES 5715C Pre-Stressed Concrete

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

CES 6118 Applied Finite element

CES 6230 Advanced Structural Mechanics

 CES 6144 Advanced Structural Analysis

CES 5209 Structural Dynamics

6 additional credit hours of coursework in Structures Engineering or closely related areas.

**Transportation Engineering**

TTE 5205 Traffic Systems Engineering

TTE 5501 Transportation Planning and Economics

TTE 6507 Travel Demand Modeling or CGN 6933 Selected Topics: Statistical and Econometric Methods

3 additional credit hours of coursework in Transportation Engineering or closely related areas.

**Water Resources**

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

CWR 6235 Free Surface Flow

CWR 6239 Waves and Beach Protection

CWR 6305 Urban Hydrology

CWR 6534 Coastal and Estuary Modeling

CWR 6535 Hydrologic Models

CGN 6933 Selected Topics: Vadose Zone Hydrology

CGN 6933 Selected Topics: Groundwater Hydraulics

CGN 6933 Selected Topics: Advanced Computational Fluid Mechanics

CWR 6820 Coastal Waves and Structures

CWR 6538 Advanced Hydrologic Model

CGN 6933 Selected Topics: Advanced Numerical Methods

CGN 6933 Selected Topics: Global Sustainability

CGN 6933 Selected Topics: Ecological Engineering

**Comprehensive Exam**

The thesis and defense are used in lieu of a comprehensive exam.

**Thesis - 6 hours minimum**

Students pursuing the M.S.C.E. are required to complete at least six (6) credits of Thesis. Students must conduct a suitable research project under the guidance of their thesis advisor, write an original thesis based upon the results of the research project, and defend the thesis to a committee that must subsequently approve the completed thesis. For students in the EFD concentration, the thesis must be associated with research in a developing-world context.

**Other Requirements**

* A maximum of 9 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.S.C.E. in Civil Engineering**

**Description**

Students pursuing a B.S.C.E. in Civil Engineering will earn a Master of Science in 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.S.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.S.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.S.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.S.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.S.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)