Graduate Curriculum Approval Form  
Changes to Degree Programs

Degree (i.e. M.A., Ph.D., etc.): MSCE  
Name of Program (e.g. Biology) Civil Engineering  
Program CIP Code 14.0801  
Name of Concentration(s) (e.g. Botany)  
Proposed Effective Term (e.g. Spring 2015) Fall 2017  
Faculty Contact Sarina Ergas  
Email sergus@usu.edu

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<tr>
<th>APPROVALS</th>
<th>Name</th>
<th>Signature</th>
<th>Action</th>
<th>Date</th>
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<tr>
<td>Dept. Chair</td>
<td>Manjikar Gunaratne</td>
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<td>☒ Approve ☐ Not approved ☐ Comments attached</td>
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<td>College Dean/</td>
<td>Sanjukta Bhanja</td>
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<td>Associate Dean</td>
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<td>Bhanja</td>
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<td>Concurrence*</td>
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<td>☐ Not Applicable ☐ Concurs ☐ Doesn't concur ☐ Comments attached</td>
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<td>Graduate Studies</td>
<td>☐ Approve ☐ Disapprove</td>
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1. Summary of Changes – Select all that apply:

☐ Change Admission Deadlines (no other changes)
☐ Change Admissions to "fall admissions only" (no other changes)
☐ Change from Regular to Direct Receipt Admissions (no other changes)
☐ Change from Direct Receipt to Regular Admission (no other changes)
☐ Change Admission Requirements
☒ Change Degree Program Requirements (including Concentration requirements)
☐ Update Course Numbers in Program Listing (i.e. from Selected Topics to Permanent Numbers) (no other changes)
☐ Other – please specify:

2. Briefly - Why are these changes necessary or desired? Four changes are requested at this time:

1) **Core coursework requirements** - BOG requires that all students in a given degree program have some common coursework. We are requiring that students in the MSCE program have two common core courses: CGN 6945 Graduate Research Methods (2 credits) and 1 credit of seminar, which can be fulfilled by taking either: CGN 6933 Grad Structures/Matris Seminar; ENV 6935 Environ/Water Resource Seminar; or TTE 6930 Grad Transportation Seminar

2) **Changes in the Engineering for International Development (EFD) -** these changes are required because the Peace Corps has ended their Masters International (MI) program throughout the US. The concentration will be retained but students will have several options for the international field experience.

3) Changes in courses for Water Resources concentration courses due to new faculty hires.

4) Updates on course numbers/titles.

3. Attach the current Catalog Copy, with the requested revisions shown using Track Changes. If the only change is to the Admission Deadline revised Catalog Copy is not required– just specify the change below. All other changes require Catalog Copy.
CIVIL ENGINEERING PROGRAM

Master of Science in Civil Engineering (M.S.C.E.) Degree

DEGREE INFORMATION

Program Admission Deadlines:
Fall: February 15
Spring: October 15
Summer: February 15

Minimum Total Hours: 30
Program Level: Masters
CIP Code: 14.0801
Dept. Code: EGX
Program (Major/College): ECE EN
Approved: 1981

Concentrations:
- Engineering for International Development (EFD)
- Geotechnical Engineering (GTL)
- Materials Engineering and Science (MTL)
- Structures Engineering (STR)
- Transportation Engineering (TPT)
- Water Resources (WRS)

CONTACT INFORMATION

College: Engineering
Department: Civil and Environmental Engineering
Contact Information: www.grad.usf.edu

PROGRAM 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 programs 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.

Accreditation: Accredited by the Commission on Colleges of the Southern Association of College and Schools.

ADMISSION INFORMATION

Must meet University requirements (see Graduate Admissions) as well as requirements listed below.

Program Admission Requirements

- 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) certificate. Verification of FE certification should be obtained from the
professional engineering (PE) board where the FE 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.

DEGREE PROGRAM 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. program. 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 program.

Total Minimum Hours

Coursework – 24 hours
Thesis – 6 hours

The program 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 Program Director for more information.

Core Courses (required) 3 hours minimum

CGN 6945 Graduate Research Methods 2

And at least one of the following:

CGN 6933 Grad Structures/Materials Seminar or 1
ENV 6935 Environmental/Water Resources Seminar or 1
TTE 6930 Grad Transportation Seminar 1

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 Nongovernmental Development Organizations. Graduates are competitive for employment in the global WaSH development field. This concentration acknowledges coursework and international field experience in the area of engineering for international development that considers issues of sustainability, environment, health, gender, and society. Students must take the
following four courses, and must engage in an extended international engineering field experience, which in most cases will form the basis of the Master’s thesis.

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  Health, Illness and Culture

A minimum of 1 course (3 credits) from the following global public health courses:
PHC 6764  3Global Health Principles & Contemporary Issues
PHC 6761  3Global Health Assessment Strategies

3 additional 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 nongovernmental organization, UNESCO-HE-, or equivalent) may register for CST 6990 for 0 credit hours while in their country of service/research.

Geotechnical Engineering (GTL)
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 (MTL)
At least 2 courses (6 credit hours) from the following list:
CGN 6933  Advanced Construction Materials
CGN 6720  Electrochemical Diagnostic Techniques
GGN-6993CES 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 (STR)
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
GGN-6993CES 6230  Advanced Structural Analysis
GGN-6993CES 6144  Advanced Structural Mechanics
CES 5209  Structural Dynamics
6 additional credit hours of coursework in Structures Engineering or closely related areas.

Transportation Engineering (TPT)
TTE 5205  Traffic Systems Engineering
TTE 5501  Transportation Planning and Economics
TTE 6507  Travel Demand Modeling or CGN 6933 Statistical and Econometric Methods
3 additional credit hours of coursework in Transportation Engineering or closely related areas.

Water Resources (WRS)
4 courses (12 credit hours) from the following list:
CWR 6235  Free Surface Flow
CWR 6239  Waves and Beach Protection
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<td>CWR 6305</td>
<td>Urban Hydrology</td>
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<td>CWR 6534</td>
<td>Coastal and Estuary Modeling</td>
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<td>CWR 6535</td>
<td>Hydrologic Models</td>
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<td>CGN 6933</td>
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<td>CGN 6933</td>
<td>Groundwater Hydraulics</td>
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<td>CGN 6933</td>
<td>Advanced Computational Fluid Mechanics</td>
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<td>GLY 6836</td>
<td>Numerical Modeling of Hydrogeologic Systems</td>
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<td>CWR 6820</td>
<td>Coastal Waves and Structures</td>
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<td>CWR 6538</td>
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<td>CGN 6933</td>
<td>Ecological Engineering</td>
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**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 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.

**COURSES**

See [http://ugs.usf.edu/course-inventory](http://ugs.usf.edu/course-inventory)