Graduate Curriculum Approval Form
Changes to Degree Programs

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

<table>
<thead>
<tr>
<th>APPROVALS</th>
<th>Name</th>
<th>Signature</th>
<th>Action</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Dept. Chair</td>
<td>Manjriker Gunaratne</td>
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<td>☑ Approve ☐ Not approved ☐ Comments attached</td>
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<td>School Committee</td>
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<td>Chair (if applicable)</td>
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<td>College Committee</td>
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<td>Chair</td>
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<td>Sanjukta Bhanja</td>
<td>☑ Approve ☐ Not approved ☐ Comments attached</td>
<td>1/13/17</td>
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<td>College Dean/</td>
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<td>Associate Dean</td>
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<td>Concurrence*</td>
<td>Dept: Chair:</td>
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<td>☑ Not Applicable ☐ Concurs ☐ Doesn’t concur ☐ Comments attached</td>
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<td>Grad Council</td>
<td>☐ Approve ☐ Tabled ☐ Not approved ☐ Comments</td>
<td>Graduate Studies</td>
<td>☑ Approve ☐ Disapprove</td>
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</tbody>
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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? Three changes are requested at this time:
   1) Core coursework requirements - BOG requires that all students in a given degree program have common coursework. We are requiring that students in the MCE program have two common core courses: CGN 6933 Professional Practice for Civil Engineers (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 courses for Water Resources concentration courses due to new faculty hires.
   3) 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.

Once College has approved, scan and email this Approval Form, and the revised Catalog Copy in Word to Graduate Studies by the deadline posted online http://www.grad.usf.edu/graduate-council.php. For questions, contact cdh@usf.edu
CIVIL ENGINEERING PROGRAM

Master of Civil Engineering (M.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: 1983

Concentrations:
- Geotechnical Engineering (GTL)
- Materials Engineering and Science (MTL)
- Structural 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 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 superfine 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.

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 (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.

DEGREE PROGRAM 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. 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

The minimum coursework requirement is 30 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 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 Program Director for more information.

Core Courses (required)  3 hours minimum

<table>
<thead>
<tr>
<th>Core Course</th>
<th>Credits</th>
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<tr>
<td>CEG 6933 Professional Practice for Civil Engineers</td>
<td>2</td>
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And at least one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tr>
<td>CEG 6933 Grad Structures/Materials Seminar or</td>
<td>1</td>
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<tr>
<td>ENV 6935 Environmental/Water Resources Seminar or</td>
<td>1</td>
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<tr>
<td>TTE 6930 Grad Transportation Seminar</td>
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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 (WR). Students may select from one of these Concentrations, or may select no concentration.

Geotechnical Engineering (GTL)

<table>
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<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CEG 5115</td>
<td>3  Foundation Engineering</td>
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<tr>
<td>CES 6118</td>
<td>3  Applied Finite Elements</td>
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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 3 Advanced Construction Materials
CGN 6720 3 Electrochemical Diagnostic Techniques
CGN 6933/ CES 6010 3 Structural Life Prediction
EMA 5326 3 Corrosion Control
EMA 6510 3 Characterization of Materials
9 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 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/CES 6230 3 Advanced Structural Analysis
CGN 6933/CES 6144 3 Advanced Structural Mechanics
CES 5209 3 Structural Dynamics
9 Additional credit hours of coursework in Structures Engineering or closely related areas.

Transportation Engineering (TPT)
TTE 5205 3 Traffic Systems Engineering
TTE 5501 3 Transportation Planning and Economics
TTE 6507 3 Travel Demand Modeling or CGN 6933 Statistical and Econometric Methods
6 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 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 1-43 Vadose Zone Hydrology
CGN 6933 1-43 Groundwater Hydraulics
CGN 6933 1-43 Advanced Computational Fluid Mechanics
GLY 6826 2 Numerical Modeling of Hydrogeologic Systems
GLY 6827C 4 Advanced Hydrogeology
CWR 6820 3 Coastal Waves and Structures
CWR 6538 3 Advanced Hydrologic Model
CGN 6933 3 Advanced Numerical Methods
CGN 6933 3 Global Water Sustainability
CGN 6933 3 Ecological Engineering
3 Additional 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 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