**Civil Engineering program**

**Doctor of Philosophy (Ph.D.) Degree**

**DEGREE INFORMATION**

**Program Admission Deadlines:**

**Fall:** February 15

**Spring:**  October 15

**Summer:**  February 15

**Minimum Total Hours:** 78 post-bachelor’s

**Program Level:** Doctoral

**CIP Code:** 14.0801

**Dept. Code:** EGX

**Program (Major/College):** ECE EN

**Approved:** 1982

**Concentrations:**

Environmental Engineering (ENV)

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](http://www.grad.usf.edu/)

**PROGRAM INFORMATION**

The Ph.D. degree is awarded in recognition of demonstrated scholarly competence and ability to conduct and report original and significant research in Civil Engineering.

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, including sustainable development, has been included in the Civil Engineering domain. Graduates of the program are prepared for careers in academia, with public agencies, or with private industry, including firms involved in planning, design, research and development, or regulation.

Ph.D. students may work in any of the areas of Civil Engineering, including Engineering Mechanics, Environmental Engineering, Geotechnical Engineering, Pavement Engineering, Materials Engineering and Science, Structures Engineering, Transportation Engineering and Planning, and Water Resources Engineering.

**Major Research Areas:**

Civil Engineering, including Engineering Mechanics, Environmental Engineering, Geotechnical Engineering, Pavement Engineering, Materials Engineering and Science, Structures Engineering, Transportation Engineering and Planning, and Water Resources Engineering.

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 for water and air quality analysis, bench and pilot scale reactor studies, field instrumentation for environmental and water resources studies, constant rate of stress consolidometer, triaxial units, and Superpave testing equipment.

**ADMISSION INFORMATION**

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

**Program Admission Requirements**

* + - * Undergraduate GPA ≥ 3.3 preferred
			* GRE with preferred minimum scores of V 150 (45th percentile), Q 159 (75th percentile ), and AW 4.0 (55th percentile)
			* TOEFL (International applicants only) 79 (550 paper based exam) or IELTS 6.5
			* Resume provided at the time of application.
			* Three (3) letters of reference provided at the time of application
		- Statement of Purpose provided at the time of application
		- Exceptions made on a case-by-case basis where warranted.

**DEGREE PROGRAM REQUIREMENTS**

**Total Program Hours: 78 hours minimum post-bachelor’s**

 **48 hours minimum post-master’s**

Core requirement – 1 hour

Concentration/primary area of study – 15 hours

Electives – 33 hours

Dissertation – 20 hours

Other course requirement – 9 hours

**Core Requirement 1 hour**

CGN 6945 1 Graduate Research Methods

An additional 48 credit hours of coursework are required. The following requirements apply to the 48 credit hours of additional coursework:

* At least 15 credit hours must be in the student’s primary area of study (see also Concentration Requirements, below). These 15 credit hours must be structured coursework, i.e., may not include thesis credits or independent study.
* Up to 30 credit hours from a previously completed Master’s degree may be applied, pending course-by-course evaluation and transfer, approved by the Department, the College, and the Office of Graduate Studies. However, no more than 6 credits of Master’s Thesis may be applied to meet the coursework requirement.
* No more than 9 credit hours of Independent Study may be applied to meet the coursework requirement.
* Directed research and/or dissertation credits may not be counted towards the coursework requirement.

**Concentration Requirements - 15 hours minimum**

The Department supports Ph.D. concentration areas in

Environmental Engineering (ENV)

Geotechnical Engineering (GTL)

Materials Engineering and Science (MTL)

Structures Engineering (STR)

Transportation Engineering (TPT)

Water Resources (WRS).

Students may select from one of these Concentrations, or may select no concentration.

**ENVIRONMENTAL ENGINEERING (ENV) - 15 hours**

ENV 6002 3 Physical Chemical Principles of Environmental Engineering

EES 6107 3 Biological Principles of Environmental Engineering

ENV 6666 3 Aquatic Chemistry

At least one course from the following:

CGN 6933 3 Green Engineering for Sustainability

CGN 6933 3 Green Infrastructure for Sustainable Communities

ENV 6510 3 Sustainable Development Engineering

Additional 3 credit hours of coursework in Environmental Engineering

**GEOTECHNICAL ENGINEERING (GTL) - 15 hours**

CEG 5115 3 Foundation Engineering

CES 6118 3 Finite Element Analysis

Additional 9 credit hours of coursework in Geotechnical Engineering or closely related areas

**MATERIALS ENGINEERING AND SCIENCE (MTL) - 15 hours**

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

CGN 6933  3 Concrete Construction Materials

CGN 6720 3 Electrochemical Diagnostic Techniques

CGN 6933 3 Structural Life Prediction

EMA 5326 3 Corrosion Control

EMA 6510 3 Characterization of Materials

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

**STRUCTURES ENGINEERING (STR) - 15 hours**

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

CES 6706 3 Advanced Concrete

CES 6835 3 Design of Masonry Structures

CES 5715C 3 Pre-stressed Concrete

1 course (3 credit hours) from the following list:

CES 6118 3 Applied Finite Elements

CGN 6933 3 Advanced Structural Mechanics

CGN 6933 3 Advanced Structural Analysis

CES 5209 3 Structural Dynamics

CGN 6933 3 Continuum Mechanics

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

**TRANSPORTATION ENGINEERING (TPT) - 15 hours**

TTE 5205 3 Traffic Systems Engineering

TTE 5501 3 Transportation Planning and Economics

TTE 6507 3 Travel Demand Modelling

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

**WATER RESOURCES (WRS) - 15 hours**

A minimum of 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 3 Vadose Zone Hydrology
CGN 6933 3 Groundwater Hydraulics

CGN 6933 3 Advanced Computational Fluid Mechanics

GLY 6836 3 Numerical Modeling of Hydrogeologic Systems

GLY 6827C 4 Advanced Hydrogeology

CWR 6820 3 Coastal Waves and Structures

CWR 6538 3 Advanced Hydrologic Modeling

Additional 3 credit hours of coursework in Water Resources or closely related areas

**Electives - 33 hours**

Selected in consultation with the student’s major research advisor and/or advisory committee

**Qualifying Exam**

Doctoral students are expected to pass a qualifying examination no later than the semester following the completion of 48 credits of coursework beyond a bachelor’s degree. At minimum, the exam will include a written dissertation proposal and oral defense by the dissertation committee. A written exam in the area of concentration may also be required. Poor performance on the qualifying exam based on the judgment of the committee may result in the student failing the exam. If a student does not pass on the first attempt, he/she may request in writing to repeat the exam. Students who fail the Qualifying examination the second time will be dismissed by the Program.

**Dissertation Requirements - 20 hours minimum**

CGN 7980 20 Dissertation

A minimum of 20 credits of dissertation, an approved PhD dissertation, and a dissertation defense are required. Students may not sign up for dissertation credits until they have defended their proposal and advanced to candidacy (see Qualifying Exam, above).

**Additional Requirements - 9 hours minimum**

Nine (9) credits of additional coursework, dissertation, or directed research are required.

**Publication Requirement**

Students must have at least one paper accepted to a peer-reviewed journal or peer-reviewed conference based on their research carried out during their doctoral studies at USF.

**COURSES**

[http://ugs.usf.edu/course-inventory](http://www.ugs.usf.edu/sab/sabs.cfm)  or <http://www2.eng.usf.edu/cee/graduate/gradautecourses.htm>