**Environmental Engineering**

**Doctor of Philosophy (Ph.D.) 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:** 48/78

**Level:** Doctoral

**CIP Code:** 14.1401

**Dept. Code:** EGX

**Major/College Codes:** ECE EN

**Approved:** 2013

**CONTACT INFORMATION**

**College:** Engineering

**Department:** Civil and Environmental Engineering

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

**Concentration:**

Engineering for International Development (EFD)

**MAJOR INFORMATION**

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

The field of Environmental Engineering has long been known for its breadth and ability to adapt to the new technological, societal, and global problems facing the environment. Major research areas include water quality engineering; air quality engineering; fate and transport of contaminants in the environment; environmental biotechnology and nanotechnology; waste management; sustainability and ecological engineering; surface water hydrology and hydraulics; groundwater hydrology; water reuse; green engineering; renewable energy; fate of emerging contaminants; and humanitarian engineering with a focus on the developing world. Graduates of the major are prepared for careers in academia, governmental agencies, nongovernmental organizations (NGOs), or private industry and firms involved in planning, design, research and development, or policy.

**Major Research Areas:**

Water quality engineering; air quality engineering; fate and transport of contaminants in the environment; environmental biotechnology and nanotechnology; waste management; sustainability and ecological engineering; surface water hydrology and hydraulics; groundwater hydrology; water reuse; green engineering; renewable energy; fate of emerging contaminants; and humanitarian engineering with a focus on the developing world.

The environmental engineering laboratories provide state-of-the-art analytical and experimental equipment for chemical and biological research. Equipment includes an ion chromatograph, atomic absorption spectrophotometer, several gas chromatrographs (including with mass spectometry), HPLC, TOC machine, and environmental chambers. Field research sites are available locally and in several international settings that include developing world communities.

**ADMISSION INFORMATION**

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

* + - * Undergraduate GPA ≥ 3.3 preferred;
			* GRE with preferred minimum scores of V 150 (45th percentile), Q 159 (75th percentile) 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.

**CURRICULUM REQUIREMENTS**

**Total Hours: 78 hours minimum post-bachelors**

 **48 hours minimum post-masters**

*Core course requirements – 9 credit hours*

*Additional requirements – 5 credit hours*

*Concentration- 9 credit hours*

*Other courses – 36 credit hours minimum*

*Dissertation - 20 credit hours’ minimum*

*Directed Research/Dissertation/Other – 8 credit hours minimum*

**Coursework requirements - 50 hours minimum**

Core Courses – 9 hours

**ENV 6002 3 Physical & Chemical Principles in Environmental Engineering**

**EES 6107 3 Biological Principles in Environmental Engineering**

**ENV 6666 3 Aquatic Chemistry**

**Additional requirements – 5 hours**

1 course (3 credits) from the following list of sustainability courses:

ENV 6617 3 Green Engineering for Sustainability

CGN 6933 3 Selected Topics: Resilient Infrastructure for Sustainable Communities

ENV 6510 3 Sustainable Development Engineering

Students may opt to complete the concentration, or an additional 9 hours of coursework as noted below.

**Concentration Requirements - 9 hours minimum**

The Department supports Ph.D. concentration area in Engineering for International Development (EFD)

**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 part of the basis of the student’s dissertation. 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.

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 3 Global Health Principles & Contemporary Issues

PHC 6761 3 Global Health Assessment Strategies

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-IHE, or equivalent) may register for CST 6990 for 0 credit hours while in their country of service/research.

Additional Courses – 27- 36 hours

Students complete an additional 27 credits of coursework if in the Concentration, or an additional 36 credits of coursework if not in the Concentration, in Environmental Engineering or related areas, of which at least 3 credits must be structured coursework in Environmental Engineering specifically. These credits may include up to 9 credits of Independent Study and/or 6 units of Master’s Thesis, pending the approval of the Department, the College, and the Office of Graduate Studies. Directed research and/or dissertation credits may not be counted towards this coursework requirement.

**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 Major.

**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 - 8 hours minimum**

Eight (8) 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**

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