UF Herbert Wertheim College of Engineering
UNIVERSITY of FLORIDA



# ENGINEERING SCHOOL OF SUSTAINABLE INFRASTRUCTURE & ENVIRONMENT

## DEPARTMENT OF CIVIL & COASTAL ENGINEERING
## DEPARTMENT OF ENVIRONMENTAL ENGINEERING SCIENCES

## GRADUATE PROGRAMS

The Engineering School of Sustainable Infrastructure & Environment (ESSIE) continues to improve and advance sustainability through a nexus of the civil, coastal, environmental and oceanographic programs.

ESSIE is comprised of the **Department of Civil and Coastal Engineering** and the **Department of Environmental Engineering Sciences**.

## ESSIE BY THE NUMBERS

**#4**

CIVIL AND ENVIRONMENTAL PROGRAM IN GRADUATING WOMEN AND UNDERREPRESENTED MINORITIES, ACCORDING TO ASEE

**#18**

BEST PUBLIC CIVIL ENGINEERING GRADUATE PROGRAM, ACCORDING TO THE 2020 U.S. NEWS & WORLD REPORT

**#20**

BEST PUBLIC ENVIRONMENTAL ENGINEERING GRADUATE PROGRAM, ACCORDING TO THE 2020 U.S. NEWS & WORLD REPORT

For more information, please visit:
essie.ufl.edu/graduate

**POWERING THE NEW ENGINEER**
**TO TRANSFORM THE FUTURE**

ESSIE.UFL.EDU

## Admissions Checklist

- Graduate Admissions Application:
  **admissions.ufl.edu/apply/graduate**
- Include the following information:
  1. **College:** EG
  2. **Program:** Civil Engineering (CE); Coastal and Oceanographic Engineering (COA); or Environmental Engineering Sciences (EES)
  3. **Research/Specialization** (required)
  4. Approximately 24-48 hours after submitting an application, you will receive an email with information on how to set-up the check status page.
- Statement of Purpose
- Three Letters of Recommendation
- 3.0 Upper-Division GPA
  ***NOTE:** We recommend international applicants use the **Foreign Credits, Inc. GPA Calculator**.*
- Official Transcripts
- Official Test Scores or FE/PE Verification
- Resume (optional)
- Background courses

**APPLY TODAY**

essie.ufl.edu/graduate

## Building Tomorrow's Leaders

ESSIE is uniquely comprehensive in its ability to address new research on civil, coastal, environmental, infrastructure and community needs. Our suite of academic and research programs foster the multidisciplinary collaborations needed to address today's and tomorrow's challenges. Our research thrusts fall into several broad areas.

**HAZARDS ENGINEERING**
- Flooding and Wind
- Traffic Congestion
- Geosystem Hazards
- Pollution (Air/Water/Soil)
- Blast

**SUSTAINABLE MATERIALS MANAGEMENT**
- Water and Wastewater Systems
- Nutrients and Solid Waste
- Air, Soil, and Hydraulic Systems
- E-Waste

**TRANSPORT SYSTEMS**
- Transport Systems for People, Vehicles, Water, Wastewater, Stormwater, and Solid Waste
- Design Transportation System Elements

**21ST CENTURY ENGINEER**
- Sensors for the Natural and Built Environment
- Data Analytics and Machine Learning

**HEALTH ENGINEERING**
- Modeling Brain Cognition
- Aerosol Hazards
- Transport of Waterborne Pathogens

**COASTAL ECOSYSTEM DYNAMICS**
- System Ecology
- Wetlands and Saltmarshes
- Ecological Engineering
- Estuaries and Aquifers

# AREAS OF SPECIALIZATION

Each of our research thrusts requires contributors from the traditional civil, coastal and environmental disciplines. Graduate students may seek academic training and research opportunities in one or more of the following disciplines. Visit **essie.ufl.edu/research** to learn more.

## AIR RESOURCES
The group studies how air pollutants are created, designs measurement techniques, devises control technologies, models the fate of the pollutants, evaluates health effects, and characterizes composition of past, present, and future atmospheres.

## COASTAL & OCEANOGRAPHIC ENGINEERING
The program is composed of faculty with a wide range of research interests in coastal physical processes. Faculty teach a variety of graduate courses while implementing state-of-the-art pedagogic methods.

## COASTAL ECOSYSTEM DYNAMICS (CESD)
This program is striving to advance fundamental science, provide solutions for resilient coastal communities, and train the next generation of scientists and engineers to succeed in academic and non-academic careers.

## ENGINEERING EDUCATION COLLABORATIVE
The program is a group of faculty who conduct research around all aspects of engineering formation. Research ranges from fundamental studies on the engineering education ecosystem to implementation of new approaches for the education of students.

## ENVIRONMENTAL NANOTECHNOLOGY
The group investigates the implication of manufacturing and tailoring of nanomaterials to environmental ecosystems as well as the development of nanodevices and nanostructured materials for environmental remediation, energy production, and sustainable manufacturing.

## GEOSYSTEMS ENGINEERING
This program focuses on geotechnical and geoenvironmental solutions through collaborative efforts of multidisciplinary faculty in five interdependent and mutually reinforcing areas: soil structure interaction, geophysical testing and nondestructive evaluation, computational poro-geomechanics, smart waste management, and beneficial use of waste materials.

## MATERIALS & PAVEMENT
The group is devoted to promoting sustainable practices in pavement engineering, enhance understanding of distress mechanisms and failure modes, develop testing and conditioning procedures to improve material characterization, and develop design approaches for pavement systems that optimize performance.

## NEW INFRASTRUCTURE PLANNING
Research focus areas include smart cities, community solar, smart meters, mitigating the impacts of wastewater infiltration, vehicle charging stations, high-speed rail, climate change, facilitative decision making, infrastructure management, work zone safety, in-situ pipe repair, oil spill, radon mitigation, flowable fill, quality control and assurance.

## STRUCTURAL ENGINEERING
This program includes infrastructure system response to extreme-event loading, durability of infrastructure and materials, health monitoring, evaluation and strengthening of existing structures, and the development of construction methods to improve long-term sustainability of new infrastructure.

## SUSTAINABLE CONSTRUCTION ENGINEERING
Our academic and research focus is on the delivery of heavy civil infrastructure projects. Graduates are prepared to plan, manage, and provide engineering support on heavy civil projects.

## SUSTAINABLE MATERIALS MANAGEMENT
This program focuses on reduction, resource and energy extraction, recycling and beneficial reuse, and sustainable disposal of domestic solid waste streams and industrial byproducts.

## SYSTEMS ECOLOGY & ECOLOGICAL ENGINEERING
Our program provides students with an integrative education in science, engineering and policy that prepares them to develop interdisciplinary solutions, design novel engineering tools, and articulate creative policies to address a range of environmental challenges.

## TRANSPORTATION ENGINEERING
Transportation engineers pursue innovative solutions to meet urban and regional mobility needs. Current research initiatives focus on autonomous and connected vehicles, big data in transportation, safety analysis, and infrastructure. The UF Transportation Institute (UFTI) provides extensive and transdisciplinary research opportunities.

## WATER SYSTEMS
This group develops the science and engineering for conveyance, treatment and reuse of potable, wastewater and stormwater, manage water resources, model and measure chemicals, particulate matter and pathogens impacting water resources, and assess the human and environmental health impacts while modeling the components of the hydrologic cycle and the impacts of climate on water resources, human and environmental health.

# Graduate Degree Programs

### DEPARTMENT OF CIVIL & COASTAL ENGINEERING

As a department with a strong emphasis on social consciousness, we continue to graduate students who make outstanding contributions to the public through business, industry, education, and government.

ESSIE.UFL.EDU/CCE

### DEPARTMENT OF ENVIRONMENTAL ENGINEERING SCIENCES

The department is a leader in interdisciplinary programs aimed at solving environmental problems and as a major on campus crucible for identification, conceptualization and resolution of environmental issues.

ESSIE.UFL.EDU/EES

# Application Deadlines

**U.S.**
**Master's & Doctorate**

- **Fall:** June 1
- **Spring:** November 15
- **Summer (only EDGE program):** March 31

**Doctorate Priority Funding Consideration**

- **Fall:** December 5

**INTERNATIONAL**
**Master's & Doctorate**

- **Fall:** March 1
- Spring: September 1
- Summer (only EDGE program): March 1

# Latin American Caribbean Scholarship

We participate in the Latin American Caribbean Scholarship award program. Under Florida statute 1009.21, full-time students who are a citizen of a Latin American or Caribbean country (including Puerto Rico and the U.S. Virgin Islands) and who receive scholarships from the federal or state government shall be classified as residents for tuition purposes.



"I CHOSE THIS PROGRAM BECAUSE OF THE STRONG SENSE OF COMMUNITY AND SUPPORT FROM BOTH THE FACULTY AND THE STUDENTS WHICH HAVE ALLOWED ME TO GROW PROFESSIONALLY AND PERSONALLY."



***- Chad Spreadbury, E.I.***
*Department of Environmental Engineering Sciences*

Herbert Wertheim College of Engineering
Engineering School of Sustainable Infrastructure and Environment

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# Available Ph.D. Positions with the Engineering School of Sustainable Infrastructure & Environment

# (Civil, Coastal & Environmental Engineering)

The Engineering School of Sustainable Infrastructure and Environment (ESSIE) at the University of Florida is pleased to announce openings for highly motivated and highly qualified students interested in pursuing a PhD.

## HOW TO APPLY:

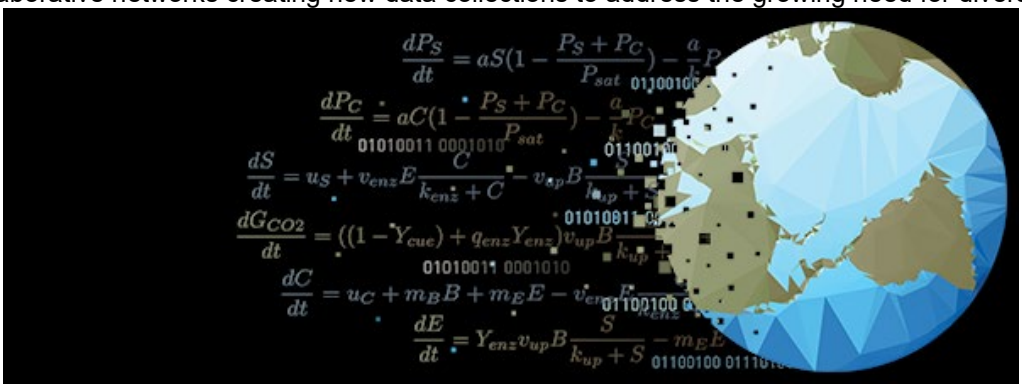
Undergraduate and Master's degree recipients or current students about to graduate within the next six to nine months are welcome to submit their applications to the University of Florida. General details regarding the application and admissions process can be found at https://www.essie.ufl.edu/student_resources/admissions/graduate/

**Below are just a few of our research faculty who are looking to hire new PhD researchers for the upcoming Fall semester.** For information on the additional areas visit https://www.essie.ufl.edu/research/ or you may contact Nancy E. McIlrath (nancy.mcilrath@essie.ufl.edu) our Graduate Academic Coordinator.

## COMPUTATIONAL BIOGEOCHEMISTRY

**Dr. Kathe Todd-Brown:** The Todd-Brown Lab at the University of Florida would like to invite you to apply for one of two PhD students assistantships beginning in 2020.

Our lab focuses on predicting soil biogeochemical dynamics under a changing climate. Research focuses on soil carbon dynamics from the pore to globe scales, spanning systems from coastal marshes to dry grasslands to boreal forests. We develop new models that explicitly represent the biological, chemical and physical processes governing soil biogeochemistry. We lead collaborative networks creating new data collections to address the growing need for diverse global datasets in soil models.



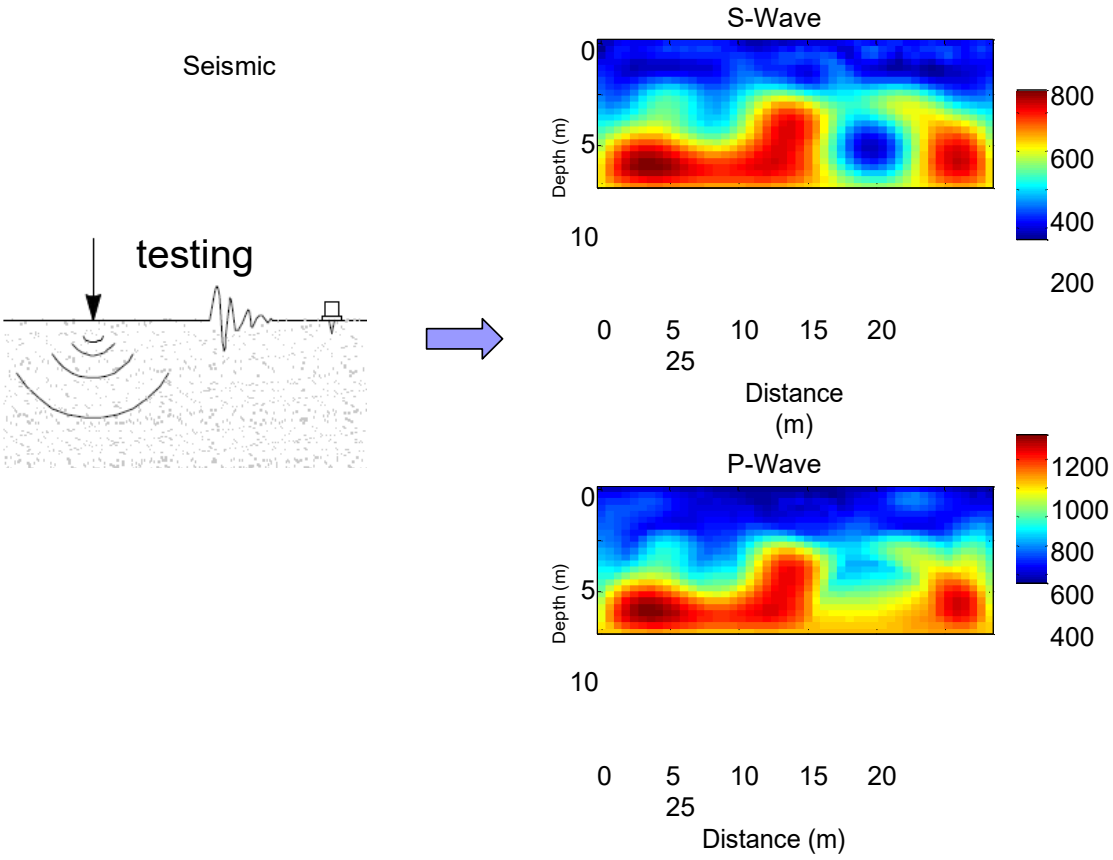

Graduate students will have a large degree of freedom to choose their research topic, students with targeted research interests are particularly encouraged to apply. Research in this lab is compute driven. However there are opportunities to collaborate with field and bench scientists, and students should expect to interact regularly with non-computational researchers.

The ideal applicate should either have a background in biogeochemistry with a strong interest in modeling and informatics OR a background in mathematics/computer science with a strong interest in soils. Applicants must have excellent written and oral communication skills. Applicants from underrepresented groups are particularly encouraged to apply.

Assistantships include stipend, tuition, and benefits. Interested applicants should email Dr. Todd-Brown (kathe.toddbrown@essie.ufl.edu) a copy of their CV and a brief cover letter outlining their interests and suitability for the assistantship.

## GEOSYSTEMS

**Seismic Waveform Tomography** (Funding through NSF and Florida DOT): Site characterization for design of substructures is crucial as unanticipated site conditions represent the most significant problems during and after construction of foundations. Subsurface investigations on a site are more frequently utilizing non-destructive testing (NDT) as the initial investigation method, as NDT is faster and cheaper than most invasive tests. The goal of the current project is to develop a seismic waveform method for extraction of 3-D subsurface geologic structures at high resolution. The focus is to obtain subsurface information at meter-scales to a depth of 30 m using optimized seismic measurements on the ground surface. Two primary efforts of the work are: (1) investigate seismic sensor 2-D spatial layouts and energy source locations for cyberphysical waveform inversion models (field data collection and real-time numerical modeling) and (2) enhanced 3-D numerical waveform inversion techniques to reduce computation cost and improve subsurface spatial resolution.




Applicants must hold a bachelor/master degree (at the time of starting the position), preferably in civil or mechanical engineering. TOEFL/IELTS and GRE official scores are required. The ideal candidates should have an interest in field data collection, working with sensors, have a strong background in mathematics (national/international awards are strongly preferred), numerical modeling, and solid programing skills (Matlab, C++). Proficiency in written and spoken English is essential. The appointment will be for a maximum of four years, and competitive salary includes fringe benefits.

Interested individuals are encouraged to send a statement of interest and CV in a single pdf to Prof. Scott Wasman scott.wasman@essie.ufl.edu and Prof. Khiem Tran khiem.tran@essie.ufl.edu. There are openings for the upcoming semester and reviews of CV's will begin immediately.

## ENVIRONMENTAL NANOTECHNOLOGY

**Dr. Andreia F. Faria** has recently joined the Department of Environmental Engineering Sciences in the Herbert Wertheim College of Engineering at the University of Florida as an assistant professor. Dr. Faria earned her Ph.D. from the University of Campinas, São Paulo, Brazil, and is also a former postdoctoral fellow in the Department of Environmental and Chemical Engineering at Yale University.

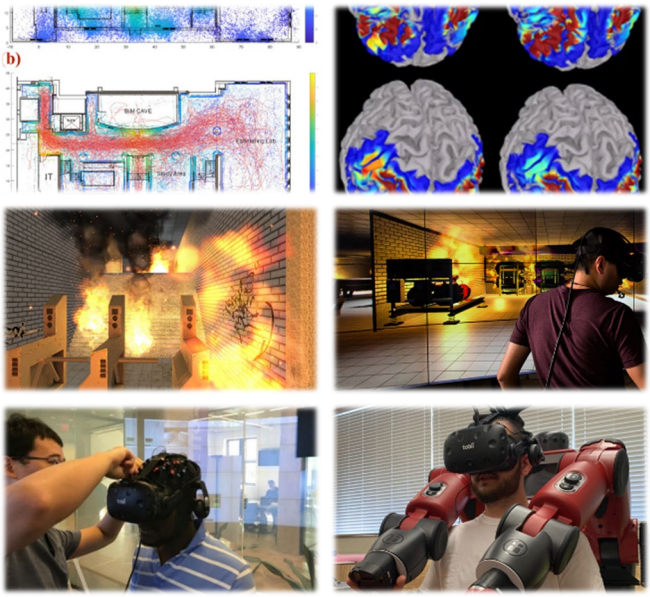
Her research interests are in the development of nano-based technologies that can benefit the environment and improve water sustainability. Throughout her academic career, Dr. Faria has applied nanomaterials for the development of anti-fouling and antimicrobial surfaces. Her projects have helped better understand how nanotechnology can bring innovative solutions to environmental engineering problems. Her current research interests at UF include the synthesis and characterization of organic and inorganic nanomaterials, the design of nano-based adsorbents for water remediation, development of biofouling resistant membranes, the toxicity of nanomaterials to microorganisms, fabrication of nano-sensing devices for water quality monitoring, and environmental toxicology of nanomaterials.

Currently, Dr. Faria is seeking a Ph.D. student to work in the area of Nanotoxicology. The candidate will carry on research on the toxicity of bidimensional nanomaterials to model bacteria cells. Our goal is to understand how changes in physical and chemical properties can affect the biological reactivity of graphene-based materials. A solid background in chemistry is desired. Hands-on experience in microbiology is desired but not mandatory. The student must feel comfortable in conducting multidisciplinary research that contemplates the areas of material science, engineering, and biology. Students from different backgrounds (engineering, biology, material science, or chemistry) are encouraged to apply. For more information about this opening, please contact Dr. Andreia Faria at andreia.faria@essie.ufl.edu.

## SUSTAINABLE CONSTRUCTION ENGINEERING

**Dr. Eric Jing Du:** A PhD research assistant position is available at the Engineering School of Sustainable Infrastructure & Environment (Civil Engineering), **University of Florida**, to work on a funded research project to investigate the use of Virtual Reality (VR) for Human-Robot Collaboration training and analysis. The expected start date is **August 15, 2020.** The student's advisor will be Dr. Eric Jing Du. The work will be interdisciplinary by nature, spanning over Virtual Reality, cognitive science, robotics and automation, and civil engineering.

Minimum Requirements:
B.S. in Civil Engineering, Industrial and System Engineering, Mechanical Engineering, Computer Science, Electrical Engineering or related fields. Other general admission requirements (TOEFL, GRE, GPA, etc.) please refer to: https://www.essie.ufl.edu/student_resources/admissions/




Du Lab: https://faculty.eng.ufl.edu/ericdu/

**Desirable Qualifications:**
Interests and experiences related to two or more of the following academic areas:

1) Virtual Reality (Unity game engine);
2) Cognitive Science (neuroimaging);

3) Robotics and Automation;
4) Computing (programming, AI);
5) Emergency Response support;
6) Disaster and risk communication.

**Assistantship Package:**
Competitive stipend, full tuition waiver, and healthcare. Room & board expenses will be covered for research travels (conferences, data collections).

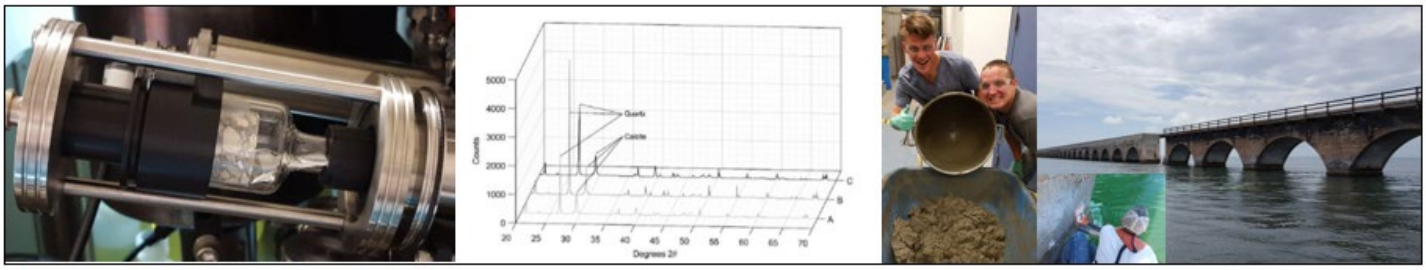
**Responsibilities:**
To work on an NSF-funded project to study Human-Robot Collaboration in Emergency Response.
Specific responsibilities include:

- To work with other PhD students on VR model developments (Unity development; C# preferred);
- To lead a user requirement study about the automation technology needs in emergency response;
- To assist the neuroimaging analysis (EEG and fNIRS);
- To lead and participate in disseminating the results via publications.

**Application Instruction:**
Please send your CV and a short research statement directly to Dr. Eric Jing Du at eric.du@essie.ufl.edu

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**Dr. Christopher C. Ferraro**, Assistant Professor is seeking PhD student research assistants to work in the Sustainable Constriction Materials Research Group. His current work is focused on reduction of anthropogenic carbon-dioxide produced as part of the construction process involving portland cement concrete. Dr. Ferraro's research seeks to develop a novel solutions regarding the development of sustainable infrastructure. His research incorporates laboratory experimentation and computational modeling which is typically administered into field experimentation to determine solutions for performance and sustainability of which is vital to the future of infrastructure. For more information on the current research program please visit https://concrete.essie.ufl.edu/
ASSISTANTSHIP PACKAGE: Competitive stipend, full tuition waiver, and healthcare. Room & board expenses will be covered for research and conference travel).
APPLICATION INSTRUCTION: Please send your CV and research statement directly to Christopher Ferraro ferrro@ce.ufl.edu



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**Dr. Denise R. Simmons**, Associate Professor in the Department of Civil and Coastal Engineering in the Herbert Wertheim College of Engineering at the University of Florida. She holds a B.S., M.S., and Ph.D. in civil engineering and a graduate certificate in engineering education – all from Clemson University. She has over ten years of construction and civil engineering experience working for energy companies and as a project management consultant.

Dr. Simmons has extensive experience leading and conducting multi-institutional, workforce-related research and outreach. She is a leader in research investigating the competencies professionals need to compete in and sustain the construction workforce. She oversees the Simmons Research Lab (SRL), which is home to a dynamic, interdisciplinary mix of graduate researchers who work together to explore human, technological and societal interactions to transform civil engineering practice with an emphasis on understanding hazard recognition, competencies, satisfaction, personal resilience, organizational culture, training and social considerations. SRL is supported by four basic research grants, including a CAREER award, and one applied research grant — all funded by the National Science Foundation (NSF) and totaling over $2 million.

Dr. Simmons is a former project director of the Summer Transportation Institute (STI) at South Carolina State University

and Savannah River Environmental Sciences Field Station (SRESFS). Both programs were aimed at recruiting, retaining and training women and minorities in transportation, environmental science and engineering and natural resources-related fields of study.

The Simmons Research Lab (SRL) at the University of Florida has fully-funded positions for graduate students with a BS degree in civil engineering (MS degree preferred) who are interested in pursuing workforce development research. Students must be able to effectively communicate with industry professionals especially those in the construction industry and transportation sector.

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Eligibility: Various funding sources are available that would support either U.S. citizens or non-US citizens. Students who hold or will hold a BS or Masters degree in civil engineering are welcome to apply The earlier you apply, the greater the opportunity you will have to participate in early recruitment events. If you are interested in this opportunity to pursue a PhD in civil engineering, please send via email (denise.r.simmons@essie.ufl.edu ) no more than one page describing

1) what problem you want to address, 2) how that problem is connected to the work of my research group, 3) why the problem is important and 4) how you plan to address the problem.

Please also attach your resume, the names and contact information for two professional references and one relevant writing sample. Use “Graduate Student Interest in SRL” in the subject line.

## SUSTAINABLE MATERIALS MANAGEMENT

The Green Engineering Technologies for the Community of Tomorrow (GETCOT) research lab at the Department of Environmental Engineering Sciences is currently seeking applicants for several full-time PhD positions in Environmental Engineering starting from Spring 2020 and Fall 2020.

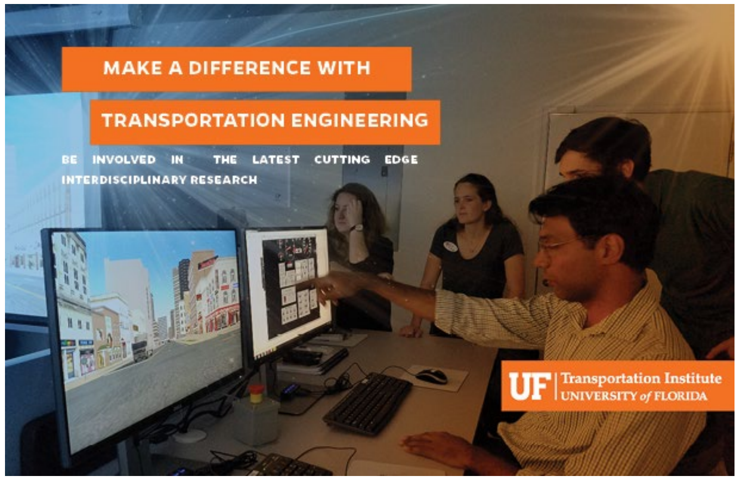


The GETCOT Lab applies a multi-disciplinary approach to develop design engineering solutions with the ultimate goal of creating sustainable systems.
Applicants with background in Industrial Engineering, Mechanical Engineering and Environmental Engineering are encouraged to apply.
The PhD students will work on research projects related to the following topics:

- Sustainable Design and Manufacturing
- Sustainability of Industry 4.0

- Energy Modeling of Blockchain and Distributed Ledger Technologies
- Data-driven Remanufacturing

Several funded PhD positions are available. The ideal candidate holds a Master's degree in industrial engineering, environmental engineering, or mechanical engineering coupled with a solid background in simulation-based optimization and data analytics techniques. Please submit your application (CV, transcripts, contact information of three references, and any publications or writing samples) to Dr. Sara Behdad (sarabehdad@essie.ufl.edu).




## TRANSPORTATION ENGINEERING

The Ph.D. program in Transportation Engineering at UFTI offers students exciting opportunities to work on cutting-edge inter-disciplinary research on the theory of traffic flow, simulation and optimization of transportation systems, traveler behavior, infrastructure design and monitoring, transportation big data analytics and machine learning, emergent technologies such as electric/automated vehicles, new travel modes such as micro-mobility and ride-hailing, dynamic traveler information systems, and safety, sustainability and resilience of multi-modal transportation systems. Students could work on projects involving real-world deployments in the I-STREET testbed in Gainesville. We are looking for students with strong analytical capabilities (one or more of statistics, big data analytics, optimization, simulation, machine learning, modeling, programming, GIS) and excellent written and oral communication skills interested in addressing various current and future transportation problems. Students from a variety of undergraduate/masters disciplines including Civil, Electrical, Mechanical, or Industrial and Systems Engineering, Computer Science, Urban Planning, and Economics will be considered based on interests and expertise. Funding for doctoral students comes from various sources such as Florida Department of Transportation, Federal Highway Administration, the University Transportation Centers, and the National Science Foundation.

Up to date information on the program and affiliated people are available at:https://www.transportation.institute.ufl.edu/education/transportation-engineering-graduate-program/

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The University of Florida was just named 7th in the nation among US Public Institutions by US NEWS & World Report. We are on a quest to be within the top 5 – Come and join us!

*The Foundation for The Gator Nation*

An Equal Opportunity Institution
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