ENGINEERING SUCCESS //

Small class sizes. Personal attention from your professors. A curriculum customized to suit your interests. A program that provides you with practical skills you can apply in the real world. These are the benefits of pursuing a graduate degree in Civil and Environmental Engineering from The University of Alabama in Huntsville (UAH).

The university’s master’s program includes both a thesis and non-thesis option in the following fields:

- Environmental Engineering
- Transportation Engineering
- Geotechnical Engineering
- Structural Engineering
- Structural Mechanics

The Ph.D. program, which is offered jointly with the University of Alabama in Birmingham, includes six credit hours at the partner institution. Students can choose from a variety of specializations, from space-based construction to Geoenvironmental Engineering.

So whether you dream of being at the head of the planning board or the head of a college classroom, stay competitive in today’s growing economy with an advanced degree from UAH.

DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING
256.824.6854
uah.edu/eng/departments/cee

SCHOOL OF GRADUATE STUDIES
256.824.6002
uah.edu/graduate

PROFESSIONAL MASTER’S DEGREE IN CIVIL ENGINEERING

Already working full time as an engineer? Then our professional master’s degree is for you! The program consists of 30 hours of coursework across three areas: transportation, structural, and environmental. Even better? Most of the courses can be accessed online, which means you won’t have to put your career on hold to get ahead!
The year, 2021, brought continued uncertainty. Through it all, I am proud to say that our students and faculty worked with cooperation and understanding through it all. Yes, there were some pains and the unknown can be frustrating, but on the whole we did the best we could and that is all that is asked. For 2022, I predict that we will continue to improve the ability of the faculty and students to teach and learn in this uncertain world.

I’m happy to report that through the pandemic, those associated with our department continued to be successful. Our graduates continued to gain meaningful employment when completing their studies, indicating that the profession of Civil Engineering continues to be a great choice for students. Our faculty continued to secure external funding, publish papers, and present (online) at national and international conferences, validating the quality of the research work being conducted. Even our alumni report that they are advancing in their careers.

For those who are and have been associated with the Civil Engineering Department at UAH, remember you are part of our current and future legacy. Make it a special. For those who are considering joining our department, please come along for the ride and see where we can take you in the future.

Sincerely,

Michael Anderson
Department Chair and Associate Dean of Graduate Education & Research
The American Society of Civil Engineers is an organization that assists students in their professional and academic development. UAH’s chapter of ASCE connects students with local professional practicing civil engineers and offers opportunities for mentorship. Students compete in competitions as a part of the ASCE Gulf Coast Student Conference, where they have the chance to develop technical civil engineering skills and student leadership. These events also allow students to connect with their fellow civil engineering peers and experience different sub-disciplines of civil engineering. This year UAH ASCE will be competing at Auburn University against other universities from Alabama, Mississippi and Louisiana. This past year UAH ASCE has placed first in the Utility Engineering and Surveying Institute (UESI) Surveying Competition and was invited to compete at the ASCE National Surveying Championship Finals.

Competition hosted by the University of Wisconsin-Platteville. UAH ASCE also had several placements in other events, including first in the sustainable conference and pykrete competitions and fourth in the American Institute of Steel Construction (AISC) Steel Bridge competition.
Ms. Yeldell is a native of Hendersonville, Tennessee. After graduating from Hendersonville High School in 1999, she attended UAH as a recipient of the UAH Presidential Scholarship and a member of the Honors Program, earning a Bachelor of Science in Civil Engineering with an environmental focus in December of 2003.

Sarah joined the Huntsville, Alabama office of QORE Property Sciences in 2002 as a Soils Lab Technician, becoming a Staff Geotechnical Engineer upon graduation. In 2005, Sarah moved to QORE’s Environmental Department, and in 2010 QORE was purchased by S&ME. During her 17-year career, Sarah has chosen to specialize in environmental compliance for industries and municipalities. Her project experience includes performance and coordination of environmental compliance services pertaining to NPDES, RCRA, EPCRA, SPCC, and air permitting; Municipal Separate Storm Sewer (MS4) compliance; and FHWA Air Quality and Noise Impact Analyses. Sarah currently serves as head of the Industrial Compliance Workgroup for the S&ME Technical Leaders Group.

Since 2001, Sarah has been an active member of ASCE. At UAH, Sarah served as the Secretary and two-year President of the UAH Student Chapter and participated in the 2001, 2002, 2003, and 2004 Concrete Canoe competitions as a worker bee, report author, paddler, and presenter. She was recognized by the Huntsville ASCE Branch as the 2002 UAH Civil Engineering Student of the Year and as the 2016 Huntsville Civil Engineer of the Year and served as the Secretary of the Huntsville Branch from 2008 to 2012.

Sarah has been married to her husband, Todd Watts, for 16 years. Todd is also a UAH civil engineering graduate and past UAH ASCE President, and they met while representing UAH at the 2001 National Concrete Canoe Competition in San Diego. They have two children, Micah (13) and Aerin (10), neither of whom show any interest in concrete.
CONGRATULATIONS TO OUR GRADUATES

MASTERS DEGREES

Jessica Lenette Morris
Izuchukwu Albert Ugwu
Thesis: “Post-Disaster Repair Planning for Interdependent Infrastructure Systems Prioritizing The Recovery of Critical Facilities”
Advisor: Dr. Abdullahi M. Salman

BACHELORS DEGREES

Logan A. Baldwin
Trevor A. Barylske
James Hunter Baugh
Cade H. Blair
Kelsi T. Burt
Brian A. Burton
Luke E. Childress
Daniel P. Dufrene
Miguel Esteban-Mateo
Tyler G. Forbes
Zoe Garcia-Peralta
Anthony Gleghorn
Taylor Alden Gordon
Alli Mechele Gower
Bailey Andrew Herfurth
Joseph A. Holbrook
Rebecca A. Ibsen
Paul Linus King IV
Reagan Lee Malone
Marlee Lyn Mason
Zeb Dylon Maze
Anna Michelle McFerrin
Mickey Kazuhiro Miki
Aaron C. Miles
Connor Grant Moore
Alexander Tate Rogers
Nathan Lloyd Rogers
Timothy Heath Senn, Jr.
Andrew Chase Shankles
Spencer Nelson Smith II
Houston John Tanner
Jack Alexander Utrevis
Nathanael Wade
Dylan Shane Weaver
Eric Merschman is currently a graduate teaching assistant for CE 498/499 Senior Design course overseeing the structural design portion of students’ projects. He is currently working towards his Ph.D. in Structural Engineering with a focus on decision-making under uncertainty for areas subjected to hurricanes. He notes that his research focuses on “reducing the uncertainty in decision-making for municipalities and quantifying how transportation networks can be more resilient to tropical cyclones over the lifespan of the network.”

Thanh Chi Vu is a teaching assistant for CE 457/557 and CE483/583. He is a PhD candidate, working on Environmental Engineering, especially adsorption of nutrients, metals and organics from water. He is trying to synthesize low-cost but effective multifunctional adsorbents that can be used for different waters with different chemistry and for removing recalcitrant organic contaminants.
The primary goal of this laboratory is to introduce junior and senior level undergraduate students to Geotechnical Engineering and the basic principles of soil mechanics (CE 373). Students conduct standard laboratory experiments to classify soil and determine the physical and mechanical properties such as specific gravity, permeability, compaction, consolidation, and shear strength. The properties of soil are critical for application in the design of foundations, dams, retaining walls, tunnels, offshore structures, and slope stability analysis. This laboratory work is supportive to the lecture material in Soil Mechanics (CE 372) and is a prerequisite to coursework that may include Foundations (CE 485), Earth Structures (CE 459), and more advanced elective courses in Geotechnics.

In the "Innovative Water Research and Technology" lab at UAH, we work on the development of innovative methods for advanced water/wastewater treatment and reuse. In particular, we focus on novel physiochemical methods such as advanced oxidation/reduction processes, electrochemical processes, and adsorption processes for the removal of a variety of pollutants from various environmental matrices. In collaboration with Dr. Duan from Optics, we are also developing a low-cost, distributed turbidity sensor network that utilizes glass optical fibers for real-time water quality monitoring in drinking water distribution systems.
RESILIENT CIVIL INFRASTRUCTURE SYSTEMS (RCIS) LAB

PI: ABDULLAHI M. SALMAN, PH.D.
ASSISTANT PROFESSOR

Project: Support Testing of 3D Printed Concrete Structures for Lunar Subscale Landing Pad Fabrication

The RCIS lab at UAH is involved in a NASA-sponsored project to evaluate the mechanical properties of concrete that can be made from lunar materials. Despite the intensifying interest in moon exploration and settlement, the high cost of developing support structures for a long-term presence on the Moon continues to threaten the realization of such an idea. This is mainly due to the lack of economical and sustainable methods of transporting needed materials from Earth and an effective construction method. To overcome these challenges, extra-terrestrial structures need to be designed for and built with two prime considerations: in-situ resource utilization (ISRU) and the use of autonomous or remote construction methods (3D printing). The capability to autonomously or remotely construct infrastructure elements to protect astronauts from radiation, micrometeorites, dust, and the lunar environment does not currently exist. With NASA’s plan to send a crewed mission to the Moon by 2024 with a sustained presence by 2028, there exists more than ever a need to develop the materials and manufacturing processes to enable this presence.

To support NASA’s ongoing effort, the research at UAH will lay the groundwork for evaluating structures made from in-situ resources and the effect of manufacturing variables on the resulting properties. Critical to the success of this proposed effort will be verifying the structural integrity of printed structures using a variety of regolith simulants. This collaboration also lays the groundwork for further development of these technologies for remote terrestrial military applications in addition to remote space applications. The project has three objectives: (i) investigate the mechanical properties of potential lunar concrete materials that can be manufactured using in-situ materials and reinforced with pulled molten lunar regolith glass fiber and rebar cast from molten lunar regolith, (ii) investigate the mechanical properties of the concrete material manufactured using AM/AC methods, and (iii) investigate the impact of curing time on the properties of the concrete material. Currently, two potential lunar concretes that can be manufactured using in-situ lunar materials are being tested: Magnesium oxide-based concrete and Calcium Sulfo-Aluminate concrete. All the materials in the two concretes are extractable from lunar regolith.
STUDENT NEWS

TRAFFIC MODELING LAB
PI: RUI MA, PH.D.
ASSISTANT PROFESSOR

Project: Identifying traffic patterns in the COVID-19 pandemic using AI and deep learning

The pandemic drastically changed travel patterns throughout the world. Dr. Rui Ma’s research team has been monitoring the traffic characteristics in the State of Alabama since the beginning of the COVID-19 pandemic. Dr. Ma’s research efforts provide unconventional perspectives to identify the normal and pandemic influenced daily traffic patterns. Instead of using daily traffic volumes, Dr. Ma’s team collected and analyzed fine resolution travel speed data for more than 17 months, and revealed the traffic pattern changes by investigating the travel speed contours along various major corridors near the City of Huntsville in Alabama. With the help of the Artificial Intelligence and Deep Learning methods, the team has developed and trained an autoencoder unsupervised model to improve and reconstruct speed contours, and then utilized Convolution Neural Networks and unsupervised clustering on the reconstructed spatio-temporal contours to classify various traffic speed patterns before and during the pandemic. The study results revealed five traffic patterns, among which it shows that the travel speed pattern in Alabama shifted ahead of the issuance date of the State stay-at-home order. The results further show that a new travel speed pattern appears at the end of stay-at-home order, which is different from either the normal pattern before the pandemic or the pandemic-influenced pattern, showing there emerges a ‘new normal’ travel pattern in the post-pandemic era.

FUNDING

RESEARCH GRANTS & CONTRACTS


Industrial Advisory Board of the Civil & Environmental Engineering Department

We thank the board members for their continuous dedication and service in support of the Civil Engineering Program.

Crawford, Alvin B., P.E.
Senior Civil Engineer
Chugach Management Services, Inc.
Redstone Arsenal, AL

Doss, Wade, P.E., PMP
Director of Engineering
U.S. Army Corps of Engineers
Huntsville Engineering and Support Center
Huntsville, AL

Kimbrough, Jack, P.E.
Associate Project Manager
Barge Waggoner Sumner and Cannon, Inc.
Huntsville, AL

Lehman, Barbara, P.E.
Project Engineer
GEO Solutions, LLC
Huntsville, AL

Mucke, Fritz, P.E.
Director, Water Department
Madison County Commission
Madison, AL

Ross, Boyce, P.E. and Board Chair
Director of Engineering
U.S. Army Corps of Engineers
Huntsville Engineering and Support Center
Huntsville, AL

Ozier, John, P.E.
President, OMI
Huntsville, AL

Yeldell, Sara L. P.E.
Environmental Engineer
Engineering Integrity S&ME, Inc.,
Huntsville, AL