

# Construction and Infrastructure Systems Engineering

**CEEatGT**  
2020-2021  
GRADUATE  
STUDIES

| MASTER'S DEGREE REQS*         | NON-THESIS OPTION | THESIS OPTION     |
|-------------------------------|-------------------|-------------------|
| SPECIALIZATION REQUIREMENT**  | 18 CREDITS        | 12 CREDITS        |
| APPROVED ELECTIVES            | 12 CREDITS        | 12 CREDITS        |
| THESIS                        | 0 CREDITS         | 6 CREDITS         |
| <b>TOTAL REQUIRED CREDITS</b> | <b>30 CREDITS</b> | <b>30 CREDITS</b> |

\*Degree requirements for the MSCE and MSENVE degrees. Requirements for the MSBIOE, MSCSE, and MSESME degrees differ – please contact gradinfo@ce.gatech.edu for more information. \*\*Specializations include: Construction and Infrastructure Systems Engineering; Environmental Engineering; Geosystems Engineering; Structural Engineering, Mechanics and Materials; Transportation Systems Engineering; Water Resources Engineering.

## PH.D. DEGREE REQS

The Ph.D. program includes research and approximately 50 credits beyond the Bachelor's degree. Doctoral students, in concert with their advisor and thesis committee, construct an individualized program of study tailored to the student's research interests.

Major elements of the program include:

- Comprehensive exam
- Minor
- Research Proposal
- Thesis
- Oral defense

**THE** Construction and Infrastructure Systems Engineering program drives technological change in the architecture/engineering/construction industry, helping organizations implement the latest research and advances we develop into their practice. Our technology research considers the human dimension throughout, allowing our students and faculty to understand the impact of their ideas on people and processes and how new approaches will work in real-life application and real-life infrastructure systems. The pace of change in our industry continues to accelerate; in short, we work to help industry to adapt and make smart change.

Our students and faculty create this platform for change. They learn where the cutting edge of construction and infrastructure systems technology currently exists and then blow past it as they push that edge toward new horizons. The interdisciplinary nature of our program encourages students to supplement their graduate courses in civil and environmental engineering with those from other programs at Georgia Tech, such as computer science, electrical and computer engineering, building construction and industrial and systems engineering. Throughout, students' education is informed by a research program funded by the National Science Foundation, Construction Industry Institute, state and federal transportation agencies, industry and other partners.

## FACILITIES

Robotics and Intelligent Construction Automation Lab (RICAL) is a research facility used in the development and application of advanced construction technologies to improve current construction methods and process for building and transportation-related infrastructure. The facility is equipped with a custom-built hybrid LIDAR system; commercial LIDAR units; UAV; custom-built, all-terrain, heavy-duty mobile robots; large display touch screens; a robot testbed; thermography cameras; wireless technologies (RFID, Ultra-Wideband, bluetooth sensors); portable pneumatic and electrical power systems. [RICAL.CE.GATECH.EDU](http://RICAL.CE.GATECH.EDU)

The Network Dynamics Lab is a research facility focused on examining, modeling and improving engineering network dynamics of industrial and societal importance. Current dynamics under exploration in the Lab include: building-occupant network dynamics, globalizing network dynamics, workforce virtualization dynamics, information system integration dynamics, and extreme event dynamics. The facility houses the CyberGRID (Cyber-enabled Global Research Infrastructure for Design), which supports experimentation and pedagogy associated with distributed project execution and enables data visualization. [NDL.GATECH.EDU](http://NDL.GATECH.EDU)

## RESEARCH AREAS

- Construction information technology
- Robotics and automation in construction
- Construction data modeling and visualization
- Knowledge management for decision support systems
- Smart, sustainable and resilient cities



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**Georgia Tech** School of Civil and Environmental Engineering  
 College of Engineering

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## FACULTY

### Construction Engineering & Management (CEM) Group

**BAABAK ASHURI, PH.D. DBIA, CCP** Associate Professor

Quantitative Methods for Construction Engineering and Management with important contributions in the areas of construction analytics, investment evaluation methods, risk analysis, innovative project delivery, and valuation of green-energy investments.

**YONG K. CHO, PH.D.** Associate Professor

Field automation, mobile & aerial robotics, SLAM, BIM, thermography, real-time 3D visualization & object recognition, wireless sensing for construction safety and indoor mobile asset tracking, IoT & cloud computing, wearable technologies.

**KIMBERLY E. KURTIS, PH.D.** College of Engineering Associate Dean for Faculty Development and Scholarship & Professor

Multi-scale structure and performance (i.e., early age through durability) of cement-based materials, cement and admixture chemistry, characterization of cement-based materials, fiber-cement composites, sustainable construction materials, forensics.

**ERIC MARKS, PH.D., P.E.** Professor of the Practice & Group Coordinator

Automated data sensing, real-time location tracking of construction resources, innovative safety solutions for construction sites, Building Information Modeling (BIM), automated safety data collection of leading indicators.

**JOHN E. TAYLOR, PH.D.** Frederick L. Olmsted Professor

Civil engineering network dynamics of industrial, societal and environmental importance, including dynamics associated with information system integration, industry globalization, workforce virtualization, energy conservation in and across buildings, and human mobility perturbation in natural disasters.

### Infrastructure Systems Engineering (ISE) Group

**ADJO AMEKUDZI-KENNEDY, PH.D.** Associate Chair for Global Engineering Leadership and Entrepreneurship, Professor

Systems engineering, infrastructure/asset management, sustainability thinking and applications, resilience thinking and applications, engineering leadership, engineering entrepreneurship

**EMILY GRUBERT, PH.D.** Assistant Professor

Interdependent infrastructure systems analysis, life cycle assessment, natural language processing, energy-water nexus, energy system transition, conventional energy systems, renewable integration, sustainable buildings, decision support, social impacts, societal prioritization in decision making

**LAURENCE J. JACOBS, PH.D.** College of Engineering Associate Dean for Academic Affairs & Professor

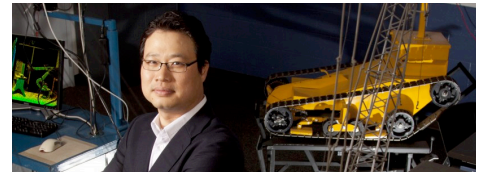
Quantitative nondestructive evaluation of civil engineering materials; wave propagation in solids, emphasizing guided waves; nonlinear methods and heterogeneous materials; optical techniques; acoustic sensors for condition monitoring of structural components.

**IRIS TIEN, PH.D.** Assistant Professor

Probabilistic methods for modeling and reliability assessment of civil infrastructure systems, stochastic processes, risk analysis, structural and infrastructure health monitoring, signal processing and machine learning, and decision making under uncertainty.

**YI-CHANG (JAMES) TSAI, PH.D., P.E.** Professor

Smart city infrastructure, new transportation systems with connected and automated vehicles, big data analytics, optimization of spatial sensing and information technology, GPS/GIS, processing and analysis of image/laser/LiDar/UAV/mobile device data using artificial intelligence and machine learning.



### EMERITUS FACULTY

**LAWRENCE F. KAHN, PH.D.**

### ADJUNCT FACULTY

**T. RUSSELL GENTRY, PH.D., P.E.**