Structural Engineering, Mechanics, and Materials

CEEatGT
2016-2017
GRADUATE
STUDIES

STRUCTURAL Engineering, Mechanics and Materials offers graduate instruction and research in structural analysis and design, design optimization, behavior of structural systems, blast-resistant design, earthquake engineering, engineering science and mechanics, high-performance materials, computer-aided engineering, uncertainty modeling and quantification, and modeling and reliability assessment of civil infrastructure systems. The faculty, students and staff are encouraged to form partnerships to create an environment that fosters learning, discovery and creativity. The faculty are leaders in their respective fields and are committed to developing in their students the skills needed to be successful in the structural engineering profession. The program's academic and research activities have earned an international reputation for excellence in areas such as creative use of advanced structural materials and composite systems to improve infrastructure; earthquake engineering; sensing, control and information technologies for smart structural systems; repair and strengthening of structures; quantitative characterization of infrastructure materials via novel imaging approaches; predicting and understanding material properties at various length and time scales; origami; design and construction of horizontally curved bridges; connection design and behavior; and structural reliability and risk assessment. Students can become involved in research activities that promote multidisciplinary solutions to civil engineering problems of global importance.

FACILITIES

Georgia Tech is equipped with state-of-the-art laboratories and instruments for all aspects of modern structural engineering and structural mechanics and materials research, including an 18,000-square-foot Structural Engineering and Materials Laboratory with an 8,000-square-foot strong floor, an L-shaped reaction wall with capacities of 100 to 300 kips, and two 30-ton-capacity cranes; a broad range of universal testing machines, with capacity to 400 kips; specialized facilities for mechanical testing with infrared thermography and photoelastic stress/strain analysis; a nondestructive evaluation/optics laboratory; a laser scanning confocal microscope; shock loading laboratory with large-scale velocity generator; and numerous high-performance workstations equipped with state-of-the-art software in structural engineering and mechanics.

SELECTED COURSES

- Advanced Applied Mathematics in Engineering
- Advanced Dynamics and Smart Structures
- Advanced Mechanics of Composites
- Advanced Solid Mechanics
- Advanced Strength of Materials
- Bridge Engineering
- Computational Methods in Mechanics
- Damage, Failure and Durability of Composite Materials
- Design of Polymer Composite Structures
- Durability of Cement-based Materials
- Earthquake Engineering
- Engineering Programming Methods
- Finite Element Method of Structural Analysis
- Inelastic Design
- Introduction to Bridge Engineering
- Manufacturing of Composites
- Material Science of Concrete
- Matrix Structural Analysis
- Multi-hazard Analysis and Design
- NDE and Forensic Evaluation
- Nonlinear Finite Element Analysis
- Prestressed Concrete
- Random Vibrations
- Rehabilitation of Existing Structures
- Reinforced Concrete Members
- Reinforced Concrete Slab Systems
- Structural Design Optimization
- Structural Dynamics
- Structural Modeling
- Structural Reliability
- Structural Steel Design
- Structural Systems
- Theory of Elastic Stability

RESEARCH AREAS

- Auto-adaptive Materials
- Blast Design
- Computational Mechanics and Structural Analysis
- Computer-Aided Structural Engineering
- Connections
- Durability of Construction Materials
- Earthquake Engineering
- High-performance Concrete and Steel
- Horizontally Curved Bridges
- Industrial Buildings
- Masonry Structures
- Nano/Microstructure of Cement-based Materials
- Polymeric Composite Materials
- Protective Systems
- Quantitative Nondestructive Evaluation
- Rehabilitation of Structural Systems
- Reliable Engineering Computing
- Risk Analysis
- Seismic Hazard Mitigation
- Shock and Impact Loadings
- Smart Materials and Structures
- Solid Mechanics in Small Scales and Geometric Mechanics
- Stability Design of Structures
- Structural Control
- Structural Health Monitoring
- Structural Reliability
- Uncertainty Modeling and Quantification

LEARN MORE

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Georgia Tech School of Civil and Environmental Engineering
College of Engineering

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FACULTY

NELSON C. BAKER, PH.D.
Dean, Professional Education & Associate Professor
Intelligent learning environments for engineering; applications of artificial intelligence and other computer-based techniques to solve engineering problems; robotic applications to civil engineering.

REGINALD DESROCHES, PH.D., F.ASCE, F.SEI
Karen and John Huff School Chair & Professor
Natural hazards risk assessment and mitigation; earthquake engineering; impact dynamics; design and analysis of bridge structures; protective systems; and structural applications of smart materials.

BARRY J. GOODNO, PH.D. *Professor*
Earthquake engineering; structural dynamics; matrix structural analysis; hybrid control of structures; influence of nonstructural components on building response; vibrations; finite element analysis; mechanics of materials.

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.

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.

RAFI L. MUHANNA, PH.D. *Associate Professor*
Computational solid and structural mechanics; uncertainty modeling; reliable engineering computing; structural reliability; finite elements.

GLAUCIO H. PAULINO, PH.D.
Raymond Allen Jones Chair & Professor
Computational mechanics, functionally graded materials, experimental methods, constitutive modeling of engineering materials, multiscale phenomena, high-order continuum, fracture and damage mechanics, solution adaptive techniques, inverse problems in mechanics, sensitivity analysis and optimization, and topology design of structures.

DAVID W. SCOTT, PH.D. *Associate Professor*
Design and use of advanced fiber-reinforced composites in infrastructure applications, structural strengthening and rehabilitation, forensics and nondestructive assessment, design of roadside safety structures.

LAUREN STEWART, PH.D. *Assistant Professor*
Full-scale experiments and computational modeling to study the effects of blast, earthquakes and their impacts on structures made of a variety of materials.

PHANISH SURYANARAYANA, PH.D. *Assistant Professor*
Multiscale modeling; ab-initio calculations; density functional theory; continuum mechanics and smart materials; efficient numerical methods for solving problems arising in a variety of fields.

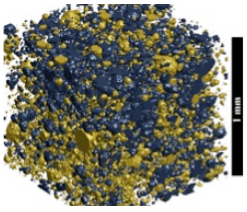
IRIS TIEN, PH.D. *Assistant Professor*
Probabilistic methods for modeling and reliability assessment of civil infrastructure systems, stochastic processes, risk analysis, structural and infrastructure health monitoring, signal processing and machine learning, and decision making under uncertainty.

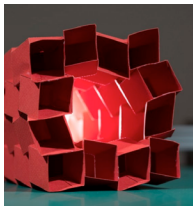
YANG WANG, PH.D. *Associate Professor*
Structural health monitoring and damage detection, decentralized structural control, smart materials and structures, wireless sensor networks, structural dynamics and earthquake engineering.

DONALD W. WHITE, PH.D. *Professor & Group Coordinator*
Computational mechanics, numerical methods, structural stability, steel structures, computer-aided engineering of building and bridge structures.

ARASH YAVARI, PH.D. *Associate Professor*
Solid mechanics in small scales, ferroelectrics, magnetoelastic and electroelastic interactions, lattice theories of solids, geometric continuum mechanics, configurational forces, and fractal fracture mechanics.

ABDUL-HAMID ZUREICK, PH.D. *Professor*
High-performance fiber-reinforced composite and stainless steel structures, strengthening of building and bridge structures, steel structures, structural stability, structural optimization, bridge structures, anisotropic elasticity.





RESEARCH FACULTY

CHUANG-SHENG (WALTER) YANG, PH.D., P.E.
Research Engineer II & Instructor
JIN YEON KIM, PH.D. *Senior Research Engineer*

ADJUNCT FACULTY

T. RUSSELL GENTRY, PH.D., P.E.
ROBERTO T. LEON, PH.D.

EMERITUS FACULTY

BRUCE R. ELLINGWOOD, PH.D.
LAWRENCE F. KAHN, PH.D.
GERALD WEMPNER, PH.D.
KENNETH M. WILL, PH.D.