Geosystems Engineering

**MASTER'S DEGREE REQS**  

<table>
<thead>
<tr>
<th>NON-THESIS OPTION</th>
<th>THESIS OPTION</th>
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<tbody>
<tr>
<td>SPECIALIZATION REQUIREMENT**</td>
<td>18 CREDITS</td>
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<tr>
<td>APPROVED ELECTIVES</td>
<td>12 CREDITS</td>
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<tr>
<td>THESIS</td>
<td>0 CREDITS</td>
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<tr>
<td>TOTAL REQUIRED CREDITS</td>
<td><strong>30 CREDITS</strong></td>
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*Degree requirements for the MSCE and MSBNE degrees. Requirements for the MSBIOE, MSCSE, and MSESM 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.

**RESEARCH AREAS**

- Bio-mediated and bio-inspired geotechnics
- Energy geotechnology
- Geotechnical analysis and design
- Natural hazards engineering
- Engineered geomaterials
- Sustainable subsurface engineering
- Rock mechanics and engineering
- Micro-geomechanics
- Subsurface characterization

**FACILITIES**

The Geosystems Engineering instruction and research laboratories occupy more than 900 square meters of custom space within the Mason Building, including:

- Soil Mechanics Instruction Laboratory
- Damage Poromechanics Laboratory
- Geoenvironmental Engineering Laboratory
- Sustainable Geotechnical Systems Laboratory
- In-Situ Research Laboratory
- Rock and Fracture Mechanics Laboratory
- Subsurface Processes Research Laboratory
- NSF Engineering Research Center for Bio-mediated and Bio-inspired Geotechnics (CBBG)

**GEOTECHNICAL SOCIETY**

The Georgia Tech Geotechnical Society serves both graduate and undergraduate students who share a common interest in geosystems engineering. The Society organizes seminars and coordinates student participation in conferences, professional meetings, intramural athletics and social events. The Society administers the Geotechnical Society Fund, a pool of resources provided by alumni, corporate donors and friends. The Society also assists the ASCE Geo-Institute Georgia Chapter with hosting the George F. Sowers Annual Symposium each spring in memory of Professor Sowers’ many academic and professional achievements.

**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

**NON-THESIS OPTION**

- 18 CREDITS
- 12 CREDITS

**THESIS OPTION**

- 12 CREDITS
- 6 CREDITS

**TOTAL CREDITS**

- 30 CREDITS
- 30 CREDITS
Geosystems Engineering

FACULTY

CHLOÉ F. ARSON, PH.D.  Associate Professor
Modeling of damage in porous and granular materials, thermodynamics, micro-mechanics, FEM and DEM numerical simulations. Applications: deep geological storage, fluid injection and withdrawal in rock, particle crushing, self-healing materials.

SUSAN E. BURNS, PH.D., P.E., F.ASCE  Associate Chair for Administration and Finance & Georgia Power Distinguished Professor
Geoenvironmental engineering; engineered materials; physical and chemical behavior of soils; physical remediation of contaminated soil and groundwater; and productive reuse of waste materials.

G. WAYNE CLOUGH, PH.D., P.E., DIST.M.ASCE., N.A.E.  President Emeritus, Georgia Institute of Technology & Secretary Emeritus, Smithsonian Institution
Tunneling, excavation, large construction; finite elements; strength anisotropy; earthquake engineering; climate change; nature and man-made hazards; engineering leadership.

SHENG DAI, PH.D.  Assistant Professor
Energy geotechnics (gas hydrate, geothermal system and carbon storage); HTCBM-coupled subsurface processes; characterization of geomaterials at high pressure-temperature conditions.

J. DAVID FROST, PH.D., P.E., P.ENG, F.ASCE  Elizabeth and Bill Higginbotham Professor & Group Coordinator
Geomaterial characterization; 2-D and 3-D micro-structure quantification; interface mechanisms; spatial earthquake hazard analysis; image processing and analysis; performance of earth retaining structures.

HAIYING HUANG, PH.D.  Associate Professor
Rock mechanics; fracture mechanics; coupled processes; flow in porous media; fluid injection into granular media; hydraulic fracturing; rock cutting and indentation.

JORGE MACEDO, PH.D.  Assistant Professor
Geotechnical earthquake engineering; performance-based engineering; risk and reliability; numerical modeling; and mining geotechnics.

PAUL W. MAYNE, PH.D., P.E.  Professor
In situ testing; site characterization; foundation systems; soil properties determination; geostatic stress state; ground improvement; and cone penetrometers.

ADJUNCT FACULTY

ROBERT C. BACHUS, PH.D., P.E.
GLENN J. RIX, PH.D., P.E.

I AM CEE AT GT: F. ALBERT LIU
Doctoral Student in Geosystems Engineering: “I chose geotechnical engineering because I have always wanted to better understand the mechanism and mitigation of natural disasters, such as earthquakes and landslides. The courses here cover a wide range of topics in geotechnical engineering, and they have shown me the extraordinary complexity and exciting opportunities in conducting research on materials that are made by nature. The faculty are extremely insightful and always willing to help. The Geosociety has created a great foundation to really get to know your fellow graduate students. I have thoroughly enjoyed my time here.”