
Ph.D. Positions in Geomechanics and Geotechnics at McMaster University

Dr. Tingting Xu's research group in the [Department of Civil Engineering at McMaster University](#) invites applications for two funded Ph.D. positions in Geomechanics and Geotechnics, with start dates in Fall 2026 or Winter 2027. The positions focus on advancing the fundamental physics of geomaterial behavior and on developing numerical methods to address engineering and geophysical challenges. Successful candidates will build computational and theoretical frameworks for complex materials and subsurface systems governed by coupled thermo–hydro–chemo–mechanical (THCM) processes.

Responsibilities

- Develop theoretical frameworks for multiscale, multiphysics geomaterial modeling, including constitutive relations and THCM coupling.
- Design, implement, and validate finite-element (or related) solvers; benchmark against analytical solutions and published results.
- Analyze results to obtain physical insight and practical engineering guidance; create clear, publication-quality figures.
- Collaborate effectively; document methods and maintain reproducible workflows (version control, organized datasets, scripts).
- Report progress through presentations and technical reports; prepare and submit manuscripts to peer-reviewed venues.

Requirements & Preferences

The following academic training, experience, skills, and qualifications are **required**:

- Bachelor's or master's degree in Civil Engineering, Geoscience, Mechanical Engineering, or a related field.
- Strong coursework in mechanics.
- Familiarity with programming languages and numerical tools (e.g., C++, Python, MATLAB) and finite-element packages.
- Effective written and oral communication skills in English.

The following experience and skills are **preferred**:

- Research experience in one or more of the following: soil mechanics, computational mechanics, fracture mechanics, finite-element methods, or nonlinear optimization.
- Master's degree (or equivalent research experience).
- Publications in peer-reviewed journals or conference proceedings.

Application

Please email Dr. Tingting Xu at xut99@mcmaster.ca with the subject line: *Ph.D. Application — [Your Name]*. Attach:

1. CV (including GPAs; TOEFL/IELTS scores if applicable).
2. A one-page statement outlining your research interests and career goals.
3. Unofficial academic transcripts.
4. Contact information for two academic references.

Please contact us as soon as possible; applications are reviewed on a rolling basis. Shortlisted candidates will be contacted for an interview.