Why GRADUATE STUDIES in GEOLOGICAL ENGINEERING?

Geological Engineering is the application of geological knowledge to working with earth materials – whether for sustainable development of resources including water, oil, gas and minerals; for construction of projects on, in or of soil and rock; or to safeguard the public from geohazards. At Queen’s, students in these fields will be exposed to geology from the field to the laboratory scale, and to analysis and decision-making in Earth Sciences, enjoying multiple field trips, and utilizing world-class labs for chemical and physical characterization of Earth materials, and numerical modelling of their behaviour.

Graduate students and their work are an important part of an ongoing research process that provides the community with ways of understanding natural, cultural, imaginative, social and technological phenomena.

Why QUEEN’S?

As a PhD student in Geological Engineering at Queen’s you are part of one of the most research intensive universities in Canada. Our research program is internationally renowned with a wide range of research activities in all of the major specialization areas of geological engineering.

The Department of Geological Sciences and Geological Engineering provides opportunities for advanced studies and research in the Earth Sciences. Faculty interests span disciplines in Applied Geoenvironmental Sciences and Geotechnique, Geophysics and Geochronology, Economic Geology and Mineral Exploration, Petrology and Structural Geology, Sedimentology, Sedimentary Geochemistry and Paleobiology often in a multi-disciplinary fashion and including applications to economic and environmental problems.

Our students come from countries all over the world, such as Brazil, Chile, Greece, and China. At Queen’s, graduate students from all disciplines learn and discover in a close-knit intellectual community.

“I wanted a challenge and saw geomechanical engineering as the answer; it would provide that challenge while simultaneously providing me an opportunity to use my structural engineering background. I came to Queen’s for my Masters, which developed into a PhD candidacy, and I haven’t looked back since.”

— Jeffrey Oke, PhD

Program STRUCTURE

PhD (4 years): Required to take a minimum of four term length graduate courses (or equivalent) beyond the Master’s degree course requirement and thesis.

RESEARCH Areas

With high-tech geochemistry and geophysics labs, geomechanics computing tools and Queen’s Facility for Isotope Research lab, our students have the opportunity to engage in cutting-edge geoscience and geoengineering research. As well, students collaborate with industrial partners, government laboratories and surveys, academic institutions worldwide and engage in extensive fieldwork on six continents, making our program truly a world-class experience. Students can avail themselves of opportunities to collaborate with other departments at Queen’s, including the GeoEngineering Centre at Queen’s and RMC, Mining, Environmental Studies and Civil Engineering.
The coronavirus pandemic may impact how some activities are delivered in 2020-2021. Please check directly with the host of any activity on the map for the latest information.

DOCTOR OF PHILOSOPHY (PhD)

**Geological Engineering PhD Map**

**YEAR I**
- Key priorities include your relationship with your supervisor, forming your research committee, coursework and comprehensive exams.
- Meet early with your supervisor to set expectations and discuss roles, responsibilities, program requirements, resources, research/occupational goals, timelines, and any required accommodation plans.
- Look to Student Academic Success Services for a variety of supports.

**YEAR II**
- Priorities include completing your comprehensive examination and pursuing substantive research.
- Set up regular meetings with your supervisor to discuss progress and obstacles to timely completion.
- Find your way through the academic process with the help of Expanding Horizons and the SGS Hatchet.
- Seek experiential/professional development opportunities.

**YEAR III**
- Continue to meet regularly with your supervisor, review research progress, and write your dissertation. Check out the SGS writing camps, like Dissertation on the Lake.
- Use conference presentations to create, discuss, and explore ways to disseminate research findings. Learn from the Expanding Horizons publishing workshops.
- Begin discussion of potential thesis defence examiners.

**YEAR IV & TRANSITIONING**
- Plan date of thesis submission for examination.
- Present your research at conferences and work with supervisor to prepare for defence.
- Review submission and examination guidelines.
- Secure necessary oral defence accommodations.
- Discuss career pathways, references letters, and publication options with your supervisor.

**ACHIEVE YOUR ACADEMIC GOALS**
- Key priorities include your relationship with your supervisor, forming your research committee, coursework and comprehensive exams.
- Meet early with your supervisor to set expectations and discuss roles, responsibilities, program requirements, resources, research/occupational goals, timelines, and any required accommodation plans.
- Look to Student Academic Success Services for a variety of supports.

**MAXIMIZE RESEARCH IMPACT**
- Think about audiences for your research.
- Complete CORE online module on research ethics if doing research regarding sensitive topics.
- Apply to NSERC, OGS, and other funding.
- Apply for the Graduate Student Travel Grant for Doctoral Field Research.

**BUILD SKILLS AND EXPERIENCE**
- Serve on faculty or university committees. Talk to the Society of Graduate and Professional Students (SGPS) for tips on getting involved.
- Consider positions in student services, the SGPS, or media outlets like the Queen’s Journal, CFRC, and the SGS Blog. Look in the AMS Club Directory.
- Use a Teaching Assistant or Research Assistant position to develop your skills and experience.

**ENGAGE WITH YOUR COMMUNITY**
- Consider volunteering with different community organizations, such as Sustainable Kingston.
- Connect to broader communities of engineers by joining an Engineering Society Design Team.

**LAUNCH YOUR CAREER**
- Finding career fit starts with knowing yourself. Take a Career Services workshop or meet with a career counsellor for help. Check out books like So What Are You Going to do With That? for advice on various career options.
- Start reading publications like University Affairs and the Chronicle of Higher Education. Browse non-academic labour market websites.
- Stay on the lookout for special events like School of Graduate Studies Career Week to explore your career pathways.

**WHAT WILL I LEARN?**
- A graduate degree in Geological Engineering can equip you with valuable and versatile skills, such as:
  - Knowledge and technical skills
  - Effective communication skills in multiple forms for diverse audiences
  - Information management: prioritize, organize and synthesize large amounts of information
  - Time management: meet deadlines and manage responsibilities despite competing demands
  - Project management: develop ideas, gather information, analyze, critically appraise findings, draw and act on conclusions
  - Creativity and Innovation
  - Perseverance
  - Independence and experience as a collaborative worker
  - Awareness, an understanding of sound ethical practices, social responsibility, responsible research and cultural sensitivity
  - Professionalism in all aspects of work, research, and interactions
  - Leadership: initiative and vision leading people and discussion

**WHERE CAN I GO?**
- A PhD in Geological Engineering can take your career in many directions. In Canada, less than 40% of all PhDs will work in post-secondary education – the majority will work in industry, government, or non-profits. Graduates from the Geological Engineering PhD program have found careers within:
  - Academia and Research
  - Consulting
  - Mineral and oil exploration
  - Mining and hydrocarbon extraction
  - Policy analysis
  - Surface and underground construction
  - Environment assessment
  - Protection and rehabilitation
  - Resource management
- Taking time to explore career options, build experience, and network can help you have a smooth transition to the world of work after graduation.

Visit careers.queensu.ca/gradmaps for the online version with links!

*This map is intended to provide suggestions for activities as career, but everyone’s abilities, experiences, and constraints are different. Build your own Grad Map using our online My Grad Map tool.*
Application FAQs

What do I need to know to APPLY?

ACADEMIC REQUIREMENTS
- Master's degree in Geological Sciences or Geological Engineering, Mining Engineering, or Civil Engineering are acceptable. Degrees in related fields such as Biology, Chemistry, Physics, Environmental Sciences or Geography are considered, but may require additional Geology courses.

ADDITIONAL REQUIREMENTS
- If English is not a native language, prospective students must meet the English language proficiency requirements in writing, speaking, reading, and listening. The School of Graduate Studies requires the following minimum scores: (1) TOEFL (paper-based): 550, (2) TOEFL iBT: Writing (24/30); Speaking (22/30); Reading (22/30); Listening (20/30), for a total of 88/120 (applicants must have the minimum score in each test as well as the minimum overall score), or (3) IELTS: 7.0 (academic module overall band score), or (4) PTE Academics: 65.

KEY DATES & DEADLINES
- Application deadline: February 1 for September admission.
- Notification of acceptance: Typically, 4 weeks after the full application has been received.

Before you start your application, please review the Graduate studies application process.

What about FUNDING?

The level of financial support consequently varies among graduate students in the Department, with a guaranteed minimum level of $23,000 for PhD students. As part of the minimum funding package, you may serve as a Teaching Assistant.

You are encouraged to apply for external funding from OGS, NSERC and other sources. Queen's will automatically issue a one time $10,000 award to incoming PhD students who have won federal government tri-council awards. For more information, see the School of Graduate Studies' information on awards and scholarships.