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 Geotechnology, 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.

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.

“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

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 to opportunities to collaborate with other departments at Queen’s, including the GeoEngineering Centre at Queen’s and RMC, Mining, Environmental Studies and Civil Engineering.

We suggest that you review the specific research projects currently being investigated by faculty members to identify a potential supervisor. Please note, however, that contacting a faculty member does not guarantee acceptance and you will need to submit your full application in order to be considered.
Geological Engineering

PhD MAP

DOCTOR OF PHILOSOPHY (PHD)

ACHIEVE YOUR ACADEMIC GOALS

YEAR I

- Key priorities include your relationship with your supervisor, form your research committee, coursework and comprehensive exams.
- Meet 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 review 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 SG5 Habitat.
- Seek experiential/professional development opportunities.

YEAR III

- Continue to meet regularly with your supervisor; review research progress, and write your dissertation.
- Check out the SG5 Dissertation Boot Camp or Dissertation on the Lake.
- Use conference presentations to create, discuss, and explore ways to disseminate research findings. Learn from the Expanding Horizons Publishing workshop.
- Begin discussion of potential thesis defence examiner.

YEAR IV & TRANSITIONING

- Plan date of thesis submission for examination.
- Prevent 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.

MAXIMIZE RESEARCH IMPACT

YEAR I

- Think about audiences for your research.
- Complete ROMEO online module on research ethics if doing research with living people or sensitive topics.
- Apply to NSERC, CGS, and other funding.
- Apply for the Graduate Dean’s Travel Grant for Doctoral Field Research.

YEAR II

- Attend or present at a conference such as the Advances in Earth Science Research Conference.
- Expand your research audience through social media such as Twitter or a blog.
- Consider publishing elements of your research. Learn from the Expanding Horizons Publishing workshop.

YEAR III

- Continue to present at conferences.
- Consider participating in the 3 Minute Thesis (3MT) competition.
- Contact the Queen's Media Centre for guidance on speaking in public about your work. List yourself on the Faculty of Engineering and Applied Science research website.

YEAR IV & TRANSITIONING

- Plan to attend conferences and connect with scholars in your field and with community partners.
- Continue public outreach through social media and the Queen’s Media Centre.
- Attend a major conference in your field, such as Canadian Geotechnical Society Annual Meeting.

BUILD SKILLS AND EXPERIENCE

YEAR I

- 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 societies, the SGPS, or media outlets like The Queen’s Journal, CERC, and the SG5 Blog. Look in the AMS Club Directory.
- Use a Teaching Assistant or Research Assistant position to develop your skills and experience.
- Consider volunteering with different community organizations, such as Sustainable Kingston.
- Connect to broader communities of engineers by joining an Engineering Society Design Team.

YEAR II

- Obtain skills for non-academic employment by continuing involvement on committees and in community.
- Start keeping an eportfolio of your skills, experiences and competencies.
- For help with teaching, get support from the Centre for Teaching and Learning (Enroll in SGS909 or the PUTCL certificate for more professional development in teaching and learning).

YEAR III

- Find opportunities for extra training through CTL, Expanding Horizons, Mitacs, or other sources to boost your skills. Investigate internships from Mitacs and other sources.
- Prepare for work or study in a multi-cultural environment by taking QUCi’s Intercultural Competency Certificate.

YEAR IV & TRANSITIONING

- Practice articulating the skills you have been developing in settings outside the university, such as casual conversation, networking, and interviews. Get help from a Careers Services workshop.
- Prepare for work or study in a multi-cultural environment by taking QUCi’s Intercultural Competency Certificate.

ENGAGE WITH YOUR COMMUNITY

YEAR I

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

YEAR II

- Participate in your graduate and professional community through activities such as graduate student outreach programs, organizing conferences, and research groups like Material Matters.

YEAR III

- Do some targeted networking with people working in careers of interest, through QueenConnects on LinkedIn, the Queen’s Alumni Association, professional associations, and at conferences. Get help from a Careers Services workshop.

YEAR IV & TRANSITIONING

- Consider joining professional associations like the Canadian Geotechnical Society.
- Join groups on LinkedIn reflecting specific careers or topics of interest.
- Consider applying for teaching assistantships at Queen’s.

LAUNCH YOUR CAREER

YEAR I

- Finding career fit starts with knowing yourself. Take a Career Services career planning workshop, or meet with a career counselor for help. Check out books like So What Are You Going to Do With That? for advice on various career options.
- Stay on the lookout for special events like Graduate Student Career Week to explore your career pathways.

YEAR II

- Start building your teaching portfolio including student evaluations, and seeking mentorship.
- Explore different careers of interest by reading alumni profiles on the SG5 website, and using QueenConnects on LinkedIn to connect with Queen’s alumni in various careers through “Ask an Alumni.” For more information check CareerCheck.
- Investigate requirements for professional positions or other opportunities related to careers of interest.

YEAR III

- Participate in hiring committees and attend job talks. Research academic careers of interest. Craft your CV and job application materials.
- Start focusing on non-academic areas of interest. Research organizations of interest and start putting together your industry resume and begin your job search plan.
- Check out the free online modules at MyGradSkills to help you plan your career.

YEAR IV & TRANSITIONING

- Build connections with faculty outside of your department. Pursue interviews for faculty positions and apply for post-doc fellowships and positions.
- Apply to jobs or make plans for other adventures. Get help from Careers Services with job searching, resumes, or interviews.
- If considering jobs abroad, research possible immigration regulations. If you are an international student interested in staying in Canada, consider speaking with an International Student Advisor.

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
- Perserverance
- Independence and experience as a collaborative worker
- Awareness of the understanding of ethical practices, social responsibility, responsible research and cultural sensitivity
- Professionalism in all aspects of work, research, and interactions
- Leadership, representation, 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.

* This map is intended to provide suggestions for activities and careers, 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: 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 $10,000 top-up award to winners of federal government tri-council awards for PhD studies. For more information, see the School of Graduate Studies' information on awards and scholarships.