Get to know

GEOLOGICAL ENGINEERING

This program applies principles and techniques of the earth sciences to solve engineering challenges such as: building infrastructure (tunnels, caverns, foundations, dams) on, with or through the materials beneath our feet; locating, evaluating and sustainably extracting essential mineral and energy resources; preventing and remediating soil, rock & water contamination; managing natural hazards; and engineering tools and methods to probe into the earth. You will study physics, chemistry, mechanics and applied mathematics as well as natural processes that shape the earth such as earthquakes, volcanoes, tectonics, mountain building, erosion and sedimentation. You will also acquire valuable field skills and training in state-of-the-art geological investigation and geo-engineering analysis and design.

Degree OPTIONS

Bachelor of Science in Engineering
Bachelor of Science in Engineering with Professional Internship
Specializations in Geotechnical, Geoenvironmental, Resource Engineering, and Applied Geophysics

Queen’s ADMISSIONS

Students apply to Queen’s Engineering (QE) through the OUAC (Ontario University Application Centre) website. Secondary School prerequisites include five 4U and 4M courses, one of which must be English 4U. Calculus and Vectors 4U, Chemistry 4U, and Physics 4U are all required along with one of Advanced Functions 4U, Biology 4U, Data Management 4U, Computer Science 4U, Earth and Space Science 4U. A final grade of 70% must be obtained in English 4U. Applicants outside of Ontario may have additional requirements.

A Common START

Queen’s is unique in offering a common First Year along with an open discipline choice. When you do choose your program, you don’t have to worry about caps or quotas. Provided you pass all of your First Year courses, you are guaranteed a place in your engineering program of choice. Queen’s also offers Section 900, a special extended program for students struggling with First Year courses. Take things at a slower pace and recover in time for Second Year.

Course HIGHLIGHTS

Geological Engineering students have the opportunity to take a wide range of technical courses to help prepare them for the many possible career destinations available. Such courses include:
- Engineering Geology
- Geological Engineering Field School
- History of Life and Earth Dynamics
- Resource Geoscience and Engineering
- Geotechnical (Rock & Soil) Engineering
- Hydrogeology and Groundwater
- Pure and Applied Geophysics
- Exploration and Environmental Geochemistry

“Geological Engineering is the practical application of principles, concepts and techniques of the geological sciences to provide sustainable engineered solutions to human needs. The Earth is our classroom, our work bench, as well as our responsibility.”

That is a degree from Queen’s.
queensu.ca/geol
# Geological Engineering MAJOR MAP

**BACHELOR OF APPLIED SCIENCE | BACHELOR OF APPLIED SCIENCE WITH PROFESSIONAL INTERNSHIP**

### 1ST YEAR
- **GET THE COURSES YOU NEED**
  - Queen's Engineering first year is common – courses include: Physics, Chemistry, Calculus, Algebra, Graphics, Computing, and Earth Systems Engineering.
  - Also APSC100, the entry level course in our Engineering Design and Practice Sequence (EDPS), focusing on problem solving, experimentation principles and finishing off with a team-based engineering project.
  - Discipline selection will take place in February!

### 2ND YEAR
- **GET THE COURSES YOU NEED**
  - You will also take the second EDPS course – APSC200 with a focus on Geological Engineering Design.
  - Following 2nd year in the spring, you will take a Geological Engineering Field School course.

### 3RD YEAR
- **GET THE COURSES YOU NEED**
  - In addition to 3 Complementary Studies courses, you will also take 4 Technical Electives in 3rd and 4th year to specialize or diversify in Geological Engineering. You would typically take 2 of these elective in 3rd year.

### 4TH OR FINAL YEAR
- **GET THE COURSES YOU NEED**
  - Courses include: 4th year Design Project and a Geological Engineering Field School (prior to the fall term).
  - You will have lots of room in this year to create your own specialized or diversified program through technical electives, developing additional expertise in geotechnical and rock engineering for mining, tunnelling or construction; mineral or energy exploration and resource development, geoenvironmental engineering and engineering geophysics.

### GET RELEVANT EXPERIENCE
- **Join teams or clubs on campus such as the Environmental Sustainability Team (QUEST) and the Queen's Project on International Development.**
- **Apply to first year positions such as First Year Project Coordinators (FYPCOs).**
- **See the AMS Clubs Directory or the Queen's Get Involved page for more ideas.**

### GET CONNECTED WITH THE COMMUNITY
- **Get involved with the Engineering Society (ENGSOC).**
- **Volunteer on or off campus with different community organizations, such as the EngWeek Committee or the ENGSOC Committee on Inclusivity.**

### GET THINKING GLOBALLY
- **Speak to a QUIC advisor or get involved in their programs, events and training opportunities.**
- **Prepare for work or studies in a multi-cultural environment by taking QUIC’s Intercultural Competency Certificate, and research possible immigration regulations.**

### GET READY FOR LIFE AFTER GRADUATION
- **Grapple with program decisions? Go to the Orientation Evenings held by different Engineering Departments and attend the various Career Fairs during the year.**
- **Get some help deciding by visiting Career Services.**

### Where could I go after graduation?
- **Assay Specialist, Architecture, Business administration, Climatology & meteorology, Coastal and river engineering, Community relations for the extractive industries, Contaminant remediation, Construction Engineering, Environmental conservation and management, Environmental engineering, Excavation design, Forestry, Geological engineering, Geoscience, Geomatics, surveying, and cartography, Geomechanics and Rock Engineering, Geophysics, (pure/applied) International development Law (environmental, contract and/or regulations), Mineral industry, Mining engineering, Natural hazard mitigation, Oceanography, Oil and gas exploration and extraction, Paleontology, Renewable energy, Toxocology, Tunneling, Waste management, Water resources.

---

*This map is intended to provide suggestions for activities and careers, but everyone's abilities, experiences, and constraints are different. Build your own Major Map using our online My Major Map tool.

Visit careers.queensu.ca/majormaps for the online version with links!
Succeed in the workplace

What employers want

The Canadian Council of Chief Executives list the top 6 skills sought by employers as:

1. People skills
2. Communication skills
3. Problem-solving skills
4. Analytical abilities
5. Leadership skills
6. Industry-specific knowledge

Get them all in Geological Engineering!

What can I learn studying GEOLOGICAL ENGINEERING?

- Knowledge of principles and techniques of the earth sciences
- Practical applications of geological science techniques to engineering design
- Understanding of the variability and change of earth materials over space and time - their history controls their future as engineering materials
- Ability to think spatially and analyze in 4 dimensions
- Fieldwork skills – design and carry out site investigations to solve problems
- Technical skills – use up-to-date geological exploration tools, analysis tools, hi-tech equipment and industry leading software
- Research skills – conduct scientific research and analyze quantitative information, develop multiple working hypotheses
- Management and leadership skills - confidence and independence in new situations, group work strategies, time and resource management
- Oral and written communication skills = confidence and success

Take the time to think about the unique skills you have developed at Queen’s, starting with the skills list here for ideas. While Queen’s Geological Engineering has an exceptional reputation in industry, it is still important to explain your strengths to others (employers) with compelling examples. This will also be important for applications to further education. For help, check out Career Services workshops.