Geological Engineering

MAJOR MAP

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 (DE) 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 100, 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


queensu.ca/geol

That is a degree from Queen's.

Geological Engineering

How to use this map

Use the 5 rows of the map to explore possibilities and plan for success in the five overlapping areas of career and academics. The map just offers suggestions – you don’t have to do it all! To make your own custom map, use the My Major Map tool.

Get started thinking about the future now – where do you want to go after your degree? Having tentative goals (like careers or grad school) while working through your degree can help with short-term decisions about courses and experiences, but also help you keep motivated for success.

Get the help you need

Queen’s provides you with a broad range of support services from your first point of contact with the university through to graduation. At Queen’s, you are never alone. We have many offices dedicated to helping you learn, think and do. Ranging from help with academics and careers, to physical, emotional, or spiritual resources – our welcoming living and learning environment offers the programs and services you need to be successful, both academically and personally, and Queen’s wants you to succeed! Check out the Student Affairs website for available resources.

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!

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.

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

Succeed in the workplace

Geological Engineering
**Gerlogeal Engineering MAJOR MAP**

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

**1ST YEAR**
- Queens University 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**
- 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**
- Stay during the summer as an assistant to a faculty member or apply for external research opportunities. Apply for NSERC USRA positions in the department of physics.
- Consider applying to do a 12-16 month QUIP internship between your third and fourth year.
- Investigate requirements for full-time jobs or other opportunities related to careers of interest. Engage in your 4th year design project - a real world example of the work that Geological Engineers do!

**4TH OR FINAL YEAR**
- Consider joining professional associations like the Canadian Geotechnical Society, the International Association of Hydrogeologists, The Tunnelling Association of Canada and the National Ground Water Association. Investigate Canadian and international professional organizations. Join groups on LinkedIn reflecting specific careers or topics of interest in Geotechnical Engineering.
- 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
  - Geological Science
  - Geometrics, 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
  - Toxicology
  - Tunneling
  - Waste management
  - Water resources

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