

GEOLOGICAL ENGINEERING AT WATERLOO

Geological Engineering is at the intersection between civil engineering and earth science and involves the application of geological knowledge to the siting, design, construction, operation and maintenance of civil engineering structures and facilities. It is one of the rapidly growing fields of engineering reflecting society's developing interest in the stewardship of the environment, managing risk, and creating a safer world. It involves expertise that includes complex engineering design, interpretation and analysis of geological materials and processes (including field work mapping), and an ability to assess how the changing earth environment may affect the integrity and long term security of civil engineering structures. The geological engineer has vital knowledge about how the earth system works.

The field of Geological Engineering encompasses a wide range of activities including the geological characterization of complex foundations of major buildings and structures, development of natural resources (mining, water, hydroelectricity, forestry, oil and gas), investigation and assessment of groundwater movement and quality, the engineering safety of major infrastructure (dams, reservoirs, offshore drilling platforms, pipelines, roads and railways), and the assessment of geohazard risk (landslides, earthquakes, volcanoes, and the stability of natural dams). It also includes aspects of such fields as project finance and insurance, land-use planning, forensic geological engineering, climate change, remote sensing (analysis of satellite data and imagery), and the application of geological knowledge to the repair and preservation of cultural heritage sites.

Geological engineering thus has a vital role in infrastructure location, design, and maintenance (roads, railways, pipelines, canals), in developing sustainable resource development (including large-scale mining) and ensuring that the exposure of planned and existing communities to geohazards is minimised.

Geological Engineering at Waterloo is an attractive discipline for students who wish to pursue the challenge of combining the complexity of nature and engineering design, who are interested in the physical mechanics of the earth's surface and subsurface, who enjoy travel and the outdoors. The subject has seamless transitions to geotechnical engineering and engineering geology. Canada has a global reach in geological engineering and currently professional job prospects on graduation are excellent.

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