

Applied Mineral Exploration Modular Courses

2026-2028



Invest in **professional development**
or earn a course-based **MSc in Geology**



Laurentian University
Université Laurentienne

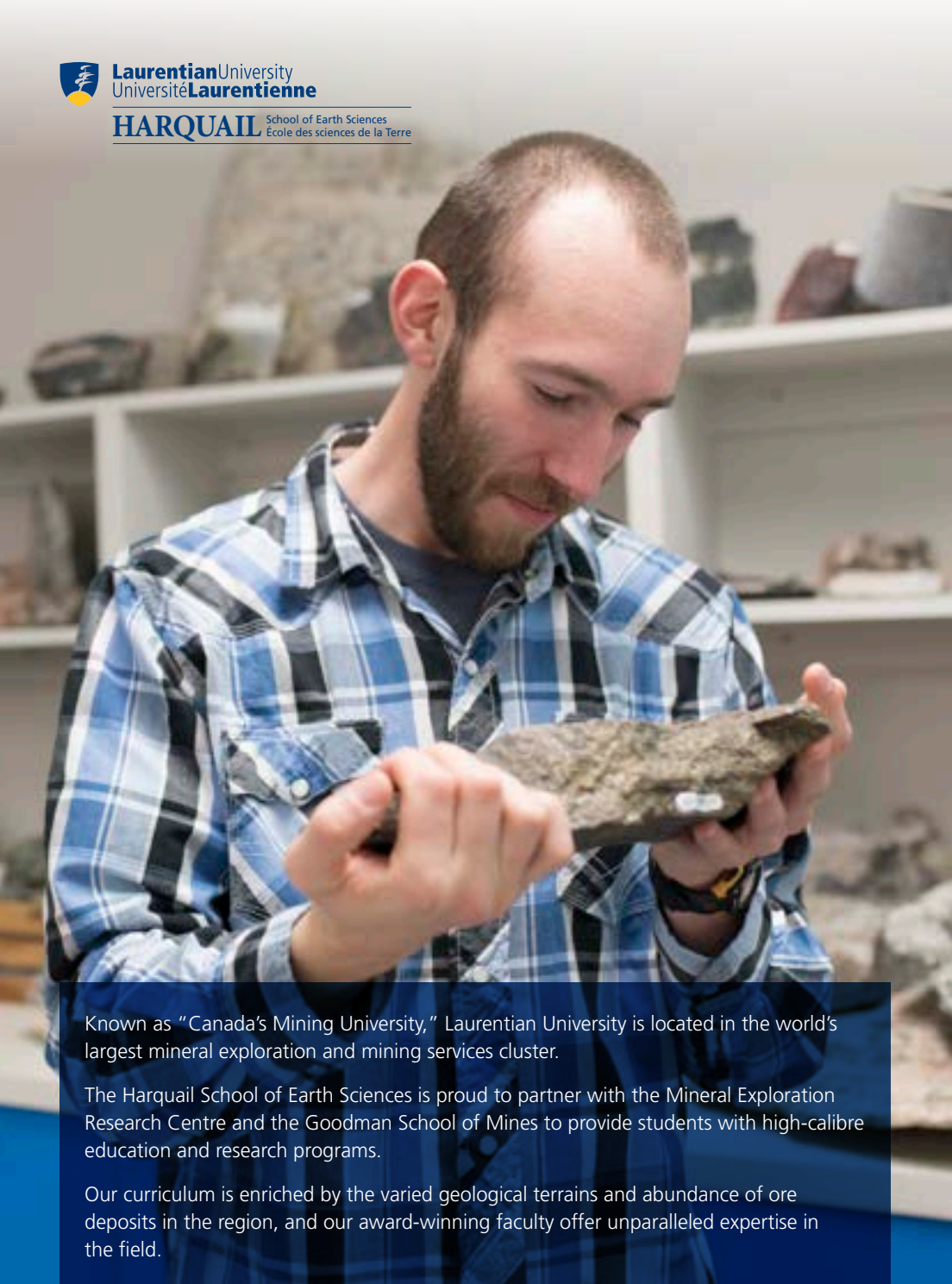
HARQUAIL School of Earth Sciences
École des sciences de la Terre

hes.laurentian.ca

MERC

Mineral Exploration Research Centre
at the HARQUAIL School of Earth Sciences

merc.laurentian.ca



Known as “Canada’s Mining University,” Laurentian University is located in the world’s largest mineral exploration and mining services cluster.

The Harquail School of Earth Sciences is proud to partner with the Mineral Exploration Research Centre and the Goodman School of Mines to provide students with high-calibre education and research programs.

Our curriculum is enriched by the varied geological terrains and abundance of ore deposits in the region, and our award-winning faculty offer unparalleled expertise in the field.

Modular Courses in Mineral Exploration

Our intensive, industry-driven Modular Courses form the backbone of our MSc Geology program, and were equally designed to meet the professional development needs of practicing geoscientists. The courses focus on the specific multidisciplinary skills and in-depth deposit knowledge required to excel in today’s field, office, and lab-based jobs in the exploration industry. Our expert guest lecturers highlight the latest developments in their fields and showcase real-world case studies.

The intensive modules encompass both field-based mapping courses and lecture- and lab-based courses. They run for 10 to 12 consecutive days, typically on-site, with some classes available via video conference. In less than 2 weeks, you can cover the material of a full graduate course, earn credits towards a degree, or receive a certificate of completion for your professional accreditation requirements.

Upcoming Courses

The Business of Exploration

May 2026

Mineral Exploration in Volcanic Terrains

August 2026

Field Geology of Precambrian Ore Systems

August 2026

3D Modeling and Exploration Targeting

October 2026

Exploration Geochemistry

December 2026

Field Program Leadership

April 2027



Courses are subject to change.

All course offerings are part of our MSc Geology - Applied Mineral Exploration degree program and may be taken for credit or professional development.

Most field and lab-based courses are offered on-site, but live webcast options may be available. Please check the website or contact us to confirm the details of upcoming courses.

Delivery methods and dates in this booklet are subject to change.

All courses are 3-credits for university-enrolled students, except for GEOL 5055 (6-credits).

The Business of Exploration

May 2026 and 2028 - [GEOL-5136]

This 11-day course provides the financial tools necessary to effectively operate in the modern mineral exploration business. It includes methods to evaluate mineral projects at various stages of advancement and examines exploration strategies and decision-making for majors and juniors through commodity and project cycles.

Field Geology of Precambrian Ore Systems

August, annually - [GEOL-5026]

Field Course

This field-based course focuses on key aspects of mineral systems: sources, pathways and traps, at the regional to deposit scales. This course shows how Precambrian mineral exploration questions can be answered by integrating detailed mapping with petrographic and whole rock geochemical analysis. The 9-day field component begins the first week of the fall session, and is followed by 3 days in the lab.

Mineral Exploration in Volcanic Terrains

August 2026 and 2028 - [GEOL 5326]

Field Course

This 10-day field course focuses on recognizing, describing, and mapping volcanic lithofacies, alteration types, mineralization, and deformation in a well-exposed Precambrian volcanic succession hosting base and precious metal deposits. The course is delivered as a mapping project with evening lectures and discussion following a one-day introductory field trip. An introduction to

graphic core logging is provided. Mapping is conducted in teams, and grades are based on the map, structural cross-sections, and a final report, which includes a description and interpretation of the geology and structure and an assessment of exploration potential with recommendations. All field costs are borne by the student.

3D Modeling and Exploration Targeting

October 2026 and 2028 - [GEOL-5146]

This course will train students to create integrated models and use them for exploration targeting. Students will analyze and integrate multi-disciplinary data in 3D models created using both explicit and implicit approaches. They will define target minimums and use traditional approaches, prospectivity mapping and become familiar with AI-assisted data analytics to select exploration targets.

Exploration Geochemistry

December 2026 and 2028 - [GEOL 5806]

This 10-day (plus optional 1-day introduction to ioGAS) course addresses the principles and methods of geochemical exploration, including planning, sampling, geochemical analysis, data handling and interpretation. It includes case histories of stratiform PGE deposits in layered intrusions, magmatic Fe-Ni-Cu-(PGE) sulfide deposits in ultramafic lavas, porphyry Cu deposits, volcanic-associated Cu-Zn-(Pb) deposits, Archean lode gold deposits, sedimentary-exhalative Pb-Zn-Cu deposits, and diamond exploration.

Field Program Leadership

April 2027 and 2029 - [GEOL-5156]

This modular course prepares students for leadership positions with responsibility for exploration field programs. By the end of this course, students will be able to apply principles of project management, design effective exploration surveys with appropriately selected parameters, and will be able to outline the legal requirements and best practices for safety, environment, community and Indigenous consultation.

Exploration for Hydrothermal Ore Deposits

April 2027 and 2029 - [GEOL 5607]

This 10-day course focuses on the geology, alteration, and origin of hydrothermal ore deposits. Deposit types include epithermal and mesothermal precious metal, porphyry Cu-Mo-Au, IOCG, sediment- and volcanic hosted base-metal deposits, and U and REE deposits. Emphasis is placed on the processes responsible for their formation, the recognition of alteration halos, and features pertinent to exploration.

Structure, Tectonics, and Mineral Exploration

September 2027 and 2029 - [GEOL 5307]

Field Course

This 12-day course addresses the tectonic and structural controls on the localization and genesis of mineral deposits. It examines regional tectonic settings, regional structural controls, and local structural controls, using orogenic Au deposits in Northern Ontario as a case study. The course is given as a field mapping course and includes evening lectures and field mapping exercises. All field costs are borne by the student.

Exploration Geophysics

December 2027 and 2029 - [GEOL 5956]

This 10-day course focuses on the application of gravity, magnetic, electrical, electromagnetic, seismic, well-logging and gamma-ray spectrometry techniques in mineral exploration. The course covers modelling techniques and an interpretation exercise.

Exploration for Magmatic Ore Deposits

April 2028 - [GEOL 5606]

This 10-day course focuses on the geology and petrogenesis of magmatic ore deposits. Deposit types include Ni-Cu-PGE sulfide, chromite, magnetite and ilmenite deposits. Emphasis is placed on the processes responsible for their formation and the features pertinent to exploration. Laboratory exercises utilize extensive sample sets from classic localities worldwide.



Applied Research Project

In this 6-credit course, eligible students pursue a research topic relevant to mineral exploration.

Enrolment in this course requires consultation with a faculty advisor and approval of the program coordinator.

[GEOL 5055]

Our Unique Location in Greater Sudbury

The wide range of geological environments, including Precambrian volcano-sedimentary belts, the Huronian Basin, the Grenville orogenic complex, and Paleozoic sequences, offers unparalleled opportunities for undergraduate and graduate research in ore deposits, structural geology, geophysics, mineralogy, igneous and metamorphic petrology, sedimentology, stratigraphy, and paleontology.

The Harquail School of Earth Sciences and the Mineral Exploration Research Centre (MERC), the lead organization on the \$104M Canada Research Excellence Fund-sponsored Metal Earth geoscience research program, are located in the Willet Green Miller Centre, in Sudbury, Ontario, Canada. Overlooking Ramsey Lake and the Lake Laurentian Conservation Area, we are situated in the world's largest mining cluster, on the rim of one of the world's oldest, largest, and best-exposed asteroid impact sites, and on rocks of the Canadian Shield.

We live, work, and teach geological science in a living laboratory and invite you to explore our School, labs, and facilities.



The Best Place on Earth to Study Geology!



Willet Green Miller Centre

Study Opportunities



Modular Courses

Industry Professionals:

Professional Geoscientists seeking advanced knowledge in the discipline can attend modular courses to satisfy continuing education requirements for maintaining professional accreditation across Canada and internationally. Professionals can register for the whole course or selected days.

Graduate Students:

Students enrolled in MSc or PhD programs at Canadian and international academic institutions are welcome to register. Confirm with your program director that credits can be applied to your program.

Modular course fees vary based on applicant type and offer exceptional value.



Degree Pathway

MSc Geology - Applied Mineral Exploration

Flexible program allowing students and professionals to complete their degree on a customized timeframe, perfect for:

- Industry geologists who wish to upgrade their skills while maintaining full-time employment
- Students who wish to quickly upgrade their skills by taking an intensive degree in as little as one year

Complete 8 modular courses or select 6 courses plus an applied research project that may focus on a problem of interest to the candidate's employer, typically in an active exploration or mining area.

To learn more, visit:

laurentian.ca/msc-applied-mineral-exploration





LaurentianUniversity
Canada's Mining University



Enrol today!

For additional modular course information, registration information, course fees, and our updated schedule, visit hes.laurentian.ca/modular-courses.

Upon registration, the full program agenda, course requirements, and logistics for your stay will be provided.

For more information on how to apply for the Applied MSc in Mineral Exploration, visit: laurentian.ca/msc-applied-mineral-exploration.



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