

# New Educational Initiatives to Address the Shortage of Highly-Qualified Professionals in the Mineral Exploration Industry

By Shannon Katary



Mapping a sub-aerial basalt flow and maar surge deposits, Valles Caldera, New Mexico (Volcanology Modular course).

**T**he current boom in mining and mineral exploration across Canada has resulted in an acute shortage of highly-qualified personnel (HQP) in these sectors.

Recognizing that the current HQP shortage will only continue to increase in both the short and long terms, the Mineral Exploration Research Centre (MERC) at Laurentian University (Sudbury, Ontario) has initiated two novel educational programmes, directed squarely at addressing this shortage from an academic perspective.

The first is a new inter-Ontario collaborative graduate curriculum that provides modular courses to educate and train the next generation of geoscientists for careers in industry, academia and government. The modular courses are given in a “team-taught” format, drawing upon faculty from universities in Ontario, across Canada and internationally, as well as researchers from the Geological Survey of Canada, the Ontario Geological Survey, and the exploration industry. The curriculum includes six courses (e.g., Exploration Geochemistry, Exploration Geophysics, etc.) offered over a two-year period, with a seventh course (Quantitative Methods for Mineral Exploration) having been added this year.

The key objective of this initiative is to increase the number of geoscience students graduating from Ontario universities, and to enhance their education and training opportunities by offering high quality modular courses with excellent career prospects in the mining, government, and research sectors. At this time, the courses are being offered only at Laurentian and Ottawa universities; however,

an expansion in the number of these courses, along with their location, is in the discussion stage.

These modular courses, which are available for graduate credit or professional accreditation, are currently being developed and coordinated by Professor Harold Gibson (who is also the Director of MERC at Laurentian University) with his counterpart Professor Mark Hannington, Director of the Canadian Shield Research Institute at the University of Ottawa.

“The main thrust of the new curriculum is to respond to the human resources needs of Canada’s exploration and mining industry,” says Dr. Gibson. Citing a 2005 report released by the Mining Training and Adjustment Council, Dr. Gibson notes that the mining industry could lose up to forty percent of its workforce in the next ten years and that a major factor in this projected shortage is fewer young professionals entering mining careers. “In essence,” he states, “we need to attract more students into graduate programs in Ontario, and into careers in the mining and exploration sectors. It is anticipated that a modular-course curriculum will attract students to our universities, not only from all across Canada, but also internationally as well.”

“Ensuring a sustained base of HQP for the mining industry and mineral sector research is a major priority for CEMI (Centre for Excellence in Mining Innovation),” adds Dr. Peter Kaiser, CEO of CEMI. “Innovative educational programming such as this goes to the very heart of the problem, and we are very grateful to the governments of Ontario and Canada for supporting this important initiative.”

Jeffrey Hedenquist delivering a lecture on epithermal precious metal deposits, Exploration for Hydrothermal Ore Deposits modular course (Ottawa University).



“The intent of the new curriculum is to bring together the best teaching expertise, and the best earth sciences graduate students, in order to create synergies and a “critical mass” that will foster educational and research excellence. A similar approach to graduate-level teaching has been very successful in Australia,” states Dr. Gibson. To date, faculty and graduate students from a variety of Ontario-based universities, including Laurentian, McMaster, Ottawa, Queen’s, Toronto, Waterloo, Western, and Windsor, have collectively participated in these modular courses.

The collaborative graduate curriculum is jointly funded by CEMI and Natural Resources Canada, the latter through their Targeted Geoscience Initiatives (TGI) Program. The curriculum of modular courses is administered through MERC and delivered through the Earth Sciences departments at Laurentian and Ottawa universities. Funding is used to offset the travel and accommodation costs of graduate students who converge at these universities to attend the courses, as well as the travel costs of faculty and researchers who deliver the courses.

This new and novel graduate curriculum utilizes the research and teaching talent that exists within the Ontario university system, maximizes the use of its resources, and engages partners from the provincial and federal governments and the broader mineral exploration community; these include industrial partners ranging from major to mid-tier to junior companies.

This curriculum is unique in that it will serve to bring together students and professionals with a common interest in the mining and mineral exploration areas, and promises to be a template for the delivery of graduate courses in other fields. Currently, longer-term funding to support the collaborative graduate curriculum will be sought from the mining industry and the Ontario government, key players who will immediately and directly benefit from this endeavour.

“An added feature is that these courses will be offered concurrently to industry personnel for skills upgrading and continuous learning on a cost recovery basis. Other courses will be developed specifically for industry upgrading tailored to specific needs and on demand,” comments Dr. Kaiser.

The second initiative is a new B.Sc. Co-op Option, developed within the Department of Earth Sciences at Laurentian University, which commenced in January 2008. It emphasizes field-based training, notably in geological mapping. It stands as an option within the four-year undergraduate program in geology, and involves staged summer

work teams: initially with government geological surveys, followed by terms in both surface and underground environments with mining-sector partners. This combination of work experience will ensure that students are being given quality mapping opportunities in a variety of environments and from a variety of perspectives.

The curriculum also includes specific modules related to exploration and mining (e.g., exploration economics) that will engage industry and government in education and training. The co-op option will provide students with a sound science education, preparing them for life-long learning and a career in a competitive and ever-changing, global exploration industry. Organizations who have expressed interest in the co-op option include the Geological Survey of Canada, the Ontario Geological Survey, VALE-Inco, FNX, Wallbridge, Hudson Bay Exploration, Teck-Cominco, and Xstrata.

Professor Andy McDonald, Chairman of the Department of Earth Sciences at Laurentian, states, “While co-op programs are not unique to this province or country, the one being offered by the Department of Earth Sciences stands alone; it is highly focused on mineral exploration and training in sound, field-based techniques.

“It will serve as an outstanding mechanism for merging what is learned in the classroom with what is required from a field-based perspective. Students registered in the program will be given a unique opportunity to learn from geoscientists positioned with university, government and industry, ensuring that they have a firm-grounding in the knowledge base required to enter into a long-term geoscience in any one of these professional settings,” Professor McDonald says.

“The B.Sc. Co-op Option is an absolute ‘win-win’ situation for all involved: first and foremost, the students will get the best earth-science education possible, and, at the same time, all of the key partners involved will be given a unique opportunity to contribute to the educational program of their future employees. The Department of Earth Sciences at Laurentian University is, indeed, proud to be a part of this program right from its inception.”

*To learn more about the new collaborative graduate program and the new B.Sc. Co-op program, please contact Professor Harold Gibson ([hgibson@laurentian.ca](mailto:hgibson@laurentian.ca)), Professor Mark Hannington ([Mark.Hannington@uottawa.ca](mailto:Mark.Hannington@uottawa.ca)), Dr. Andy McDonald ([amcdonald@laurentian.ca](mailto:amcdonald@laurentian.ca)) or visit the Department of Earth Sciences or MERC at [www.earthscience.laurentian.ca](http://www.earthscience.laurentian.ca) and <http://merc.laurentian.ca>. ☒*