

A MINING ENGINEER: A GLOBAL CITIZEN



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Photo courtesy of Teck.



Being a mining engineer is about a lot more than rocks, minerals, and hard hats. The opportunities are vast and varied. Mining Engineering includes everything to do with the extraction of valuable mineral resources from the Earth. It is a multidisciplinary career that incorporates mechanical, environmental, chemical, civil and geological engineering principles within a sustainable economic and social framework.

“We aim to be a leader in a new era where mining assumes a more responsive and responsible role in the world, helping to address the pressing need for social equity and sustainability.”

-- Malcolm Scoble, Professor

FOR CANADIAN MINING ENGINEERS TECHNICAL WORK INCLUDES ...

- investigating and evaluating mineral deposits to determine whether they can be mined profitably.
- employing computer-aided design packages to design adits, tunnels, shafts, pits and haulage roads for underground and surface mines.
- planning the logistics of mine development and the methods that will be used to extract minerals.
- analyzing and selecting equipment for mining and mineral processing.
- managing the design, construction and operation of mining and mineral processing facilities.
- developing long term plans for mine closure.
- designing mines to contribute to sustainable development.
- managing environmental impacts at all stages of a mine's operation.
- developing novel mineral processing technologies and processes.

CANADIAN MINING ENGINEERS ARE GLOBAL CITIZENS BECAUSE THEY ...

- bring high Canadian safety standards for mining to all corners of the world.
- promote environmental sustainability through long term closure planning.
- foster corporate responsibility.
- cultivate sustainable industry in developing nations.
- provide high-paying career opportunities in areas where jobs are scarce.
- provide education, training and contracting opportunities in communities where mines are being developed.

Professional challenge ...

Ours is a challenging, exciting and rewarding profession with diverse career opportunities.

NBK Institute

Mining Engineering

Graduates

tend to attract

the highest salaries

of all engineering

disciplines.



Photo courtesy of Teck.

THE MINING INDUSTRY IN CANADA

Mining is one of the fastest growing industries in Canada and is also one of the highest paying industrial sectors nationwide according to a 2011 report by the Mining Association of British Columbia.

In 2010, the Mining Association of Canada reported that Canada is the top producer of potash and uranium and a major producer of aluminum, molybdenum, nickel, zinc, copper, diamonds, oil, gold, iron and coal.

The sector will face significant challenges in the near future in finding qualified people to fill vacant positions. According to the Mining Industry Human Resources Council's **Canadian Mining Industry Employment and Hiring Forecasts 2011 Report**, the industry will have to hire 112 000 new workers by the end of 2021 to satisfy replacement needs and fill new positions. This number could increase to 141 500 if commodity prices perform better than expected.

Growth and development continues to create a high demand for base metals, precious metals, uranium and potash. This demand is expected to last for decades.

112 000 new workers by the end of 2021.



WHY **UBC**?

The University of British Columbia is consistently listed in the top 40 global universities. It is a diversified comprehensive university with over 50 000 students.

UBC's Norman B. Keevil Institute of Mining Engineering (NBK Institute) is one of North America's largest and most advanced centres for mining engineering education and research.

Mining at UBC offers a broad professional degree program, integrating courses on engineering principles, earth and mineral sciences, mining and mineral processing case studies, health, safety and environmental issues, social sciences and management, as well as economics and business.

Emphasis is on providing students with the comprehensive knowledge and hands-on skills to succeed in the industry. Students have opportunities for industry employment and participation in research activity at working mines. This approach helps our students develop practical skills and gain exposure to valuable industry experience.



a place of mind

Emphasis is

on providing students with comprehensive knowledge and hands-on skills to succeed in the industry.

Our faculty members are active within the industry through research, consulting activities and involvement in professional societies.

Around the world, wherever mines or mineral prospects are located, UBC alumni are working with mining and exploration companies, and government agencies.

End result: An innovative, industry-responsive and internationally recognized program of the highest caliber.

OUR PROGRAMS

The NBK Institute offers the following educational programs:

- Undergraduate Mining Engineering Degree
- Graduate Degrees:
 - Master of Engineering Degree
 - Master of Applied Science Degree
 - Doctor of Philosophy Degree
- Certificate in Mining Studies.



Graduates will be technology smart, innovative and responsible leaders.

UNDERGRADUATE

MINING ENGINEERING DEGREE (B.A.SC.)

The NBK Institute is committed to creating an environment that generates highly qualified people who have practical training and experience using new technology and innovative mining practices.

All UBC Engineering students complete a common, foundation year consisting of courses in general engineering, math, chemistry and physics.

In second year, mining students are introduced to key principles in Mining and Mineral Processing in addition to other core engineering principles from other disciplines.

Third year coursework provides opportunities for students to develop an in-depth understanding of rock mechanics, rock fragmentation, surface and underground mine design, physical mineral processes, flotation, mineral deposit modeling and engineering economics.

For more info email: info@mining.ubc.ca

In the final year of the program, students complete coursework in ventilation, mine management, industrial automation and robotics, waste management, mining and environment, as well as mine and plant feasibility study.

Electives include mining, processing or maintenance engineering options.

Every year, graduating students in the Mining Engineering Undergraduate Program undertake an international field trip to learn about the industry in a different part of the world. Past trip destinations have included Australia, Brazil, Chile, China, Nevada, Poland, Portugal, Spain, and Turkey.

Photo courtesy of Teck.



Know your options ... drive and motivation are key.



Photo courtesy of Mike Fuller.

Men and women from all around the world and from diverse backgrounds.

GRADUATE DEGREES **IN MINING ENGINEERING**

Graduate studies at UBC are intellectually challenging, global in scope, interactive in process and interdisciplinary in content.

Graduate students, men and women from all around the world and from diverse backgrounds, work and study in small groups, yet have the advantage of utilizing world-class facilities.

MASTER OF ENGINEERING DEGREE (M.ENG.)

The NBK Institute offers an innovative Master of Engineering Program in Mining Engineering, providing a world-class professional development program akin to an MBA. It is designed for professionals and engineering graduates eager to upgrade skills to build a strong foundation for a successful, exciting career in the global mining industry.

Why select this option?

- Learn state-of-the-art mining technology, theory and practice in one of the world's leading mining departments.
- Study with classmates from across Canada and around the world.
- Be immersed in a North American educational and industrial culture.
- Gain paid work experience with a wide range of companies in the mining sector.
- Capped class size ensures an intimate and interactive learning environment.

Schedule:

Typically students complete a one month orientation, two academic terms of coursework (eight-months), two co-op paid work terms (eight-months), and a final academic term (four-months) during which they complete their engineering project. The program typically takes 21-months to complete.

Specializations include:

- Mining
- Mineral Processing
- Mine Environment and Sustainability
- Mine Economics and Finance.

For more info email: meng@mining.ubc.ca

Providing a world-class professional development program.



Photo courtesy of Teck.

MASTER OF APPLIED SCIENCE (M.A.SC.) & DOCTOR OF PHILOSOPHY (PH.D.) DEGREES

These degrees are research-oriented and intended for students wishing to become involved in advancing either the “state-of-the-art” or the “state-of-practice” in a wide range of mining, processing, environmental and social sciences.

Both degrees allow a student to engage in the innovative and dynamic research areas shaping the industry today.

Each student needs to secure the support of a faculty member to advise him/her during their studies.

A written thesis describing his/her original research is required. Upon completion, M.A.Sc. and Ph.D. candidates perform an oral defence of their thesis.

Why select this option?

- Explore problems related to mining and mineral processing technology, social aspects of mining or sustainability.
- Participate in research activity at working mines.
- Funded (paid) or self-funded investigations.
- Program supervision from enthusiastic leading faculty members with ongoing research and strong ties to industry.
- A collegial learning community.
- State-of-the-art mining lab facilities.

Schedule:

Typically M.A.Sc. students complete their degree in 2 years. The degree requires 30 credits consisting of 18 credits of course work and a 12-credit thesis.

The Ph.D. degree is usually completed in 4 years. All doctoral students are required to successfully complete a comprehensive examination. The major requirement is the completion of a research thesis which meets the Faculty of Graduate Studies requirements.

See “Research Focus” for a list of the NBK Institute’s diverse research strengths.

For more info email: info@mining.ubc.ca

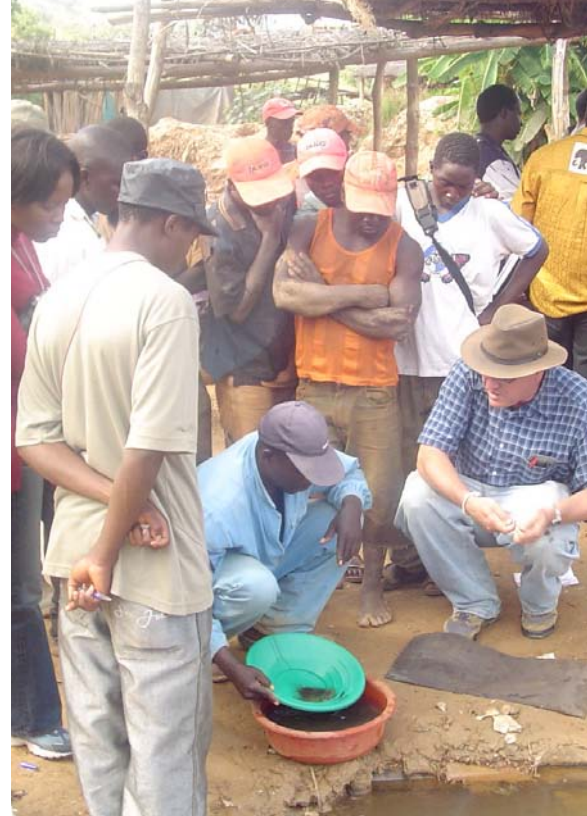
RESEARCH FOCUS: Sustaining Balance ... Make a Difference!

The NBK Institute is a global leader in multi-disciplinary research in such areas as mining and sustainability, mining and communities, and mining and aboriginal engagement. This fosters the development of effective and ethical leadership, teamwork, networking and interpersonal skills that are the hallmark of a global mining professional.

Our research strengths include:

- Automation and Virtual Intelligence
- Carbon Sequestration
- Coal Processing

- Corporate Social Responsibility
- Energy Efficient Comminution Technologies
- First Nations Engagement
- Integrated Mining and Processing Systems
- Maintenance Engineering
- Mine Project Financing and Valuation
- Mine Waste Management
- Mineral Beneficiation
- Mining and Communities
- Mining and the Environment
- Rock Mechanics and Geotechnical Engineering
- Surface Chemistry and Flotation
- Underground Bulk Mining.



Faculty experts conduct research to promote industry advances as well as to teach and support graduate students.

Funding for research comes from two main sources:

- industry
- government.

Our research initiatives include:

- Centre of Environmental Research in Minerals, Metals and Materials (CERM3)
- Centre for Industrial Minerals' Innovations (CIMI)
- Chair in Mining and the Environment
- Chair in Mining Sustainability
- Global Mercury Project
- Mining Geomechanics Group
- Sustainability Working Group
- Canadian Business Ethics Research Network.

Progress
through research
is a collaborative
effort with results
that benefit the
mining industry
in this generation
and the next.

Integrate academic studies with industry work experience.

CO-OPERATIVE EDUCATION PROGRAM

The Co-operative Education Program formally integrates academic studies with industry work experience. Benefits of participating in the Co-op program are:

- engaging, applicable work, rather than observation.
- work experience that complements the learning environment.
- competitive remuneration.
- supervision and evaluation provided by both the Co-op office and the industry employer.

Co-op programs alternate classroom and work site experiences according to set schedules of four to eight month work terms.

Students have the option of participating in the Co-op program through the:

- B.A.Sc. Program
- M.Eng. Program.

website: www.coop.apsc.ubc.ca

Photo courtesy of Teck.



The **CMS** is designed to meet the requirements of the global mining community.

CERTIFICATE IN MINING STUDIES (CMS)

The Certificate in Mining Studies (CMS) is a continuing education program of accredited short courses, webcasts and online courses for lifelong learning in mining. It is designed for those seeking professional development, career advancement, cross training in different disciplines, or just an introduction to mining.

The CMS is also designed to the requirements of the global mining community. It minimizes the need for travel and time away from the job and allows the student flexibility to complete the program at his/her own pace.

Students can structure their own CMS program from a range of courses to suit their career objectives.

Qualifying courses are available in six mining streams:

- Exploration - Geology - Reserves
- Geotechnics - Rock Mechanics - Hydrology
- Environment - Social Issues - Health + Safety
- Mining Methods - Mine Planning
- Management - Risk - Financial
- Mineralogy - Mineral Processing.

For more info email: LLL@mining.ubc.ca



UBC prepares students to be **Global Citizens** who are adaptable and able to apply their technical knowledge to a variety of changing situations.

UBC Mining Engineers are in great demand in the global job market. They work in the field, as well as in research, management and consulting. All over the world, UBC mining engineers are employed by:

- mining companies extracting metals industrial minerals, coal and oil
- mineral exploration companies
- engineering design, contracting and consulting companies
- provincial or federal governments
- banks, financial and legal corporations
- equipment manufacturers and suppliers.

People are attracted to this industry because of:

- travel - work anywhere in the world
- careers that range from pure teaching and research to senior management
- financial rewards - high salaries
- opportunities for critical thinking and problem solving
- opportunities for life-long learning and continuing career advancement
- high demand
- access to state of the art technologies.

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CONTACT US

FRANK FORWARD BUILDING

Room 517, 6350 Stores Road,
Vancouver, B.C., Canada V6T 1Z4

Email: info@mining.ubc.ca

Website: www.mining.ubc.ca

Phone: 604-822-2540

Fax: 604-822-5599

NORMAN B. KEEVIL
INSTITUTE OF MINING ENGINEERING

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A MINE IS A COMMUNITY



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