

Course Code	Title	Term	Instructor	Estimated Enrollment	Estimated # of TA ships and hours	Required Background/Skills	Application Status	Description
MINE201 A MINE201 B	<i>Introduction to Mining and Mineral Processing</i>	F	Mario Morin	36 (LY33)	1 TA (30 hrs)	Must possess an undergraduate degree in Mining Engineering. Preferably has some experience working in the mining industry.	Open	This course presents and overview of all aspects of mining from exploration, financing, development and mining operations. Underground and open pit mining are contrasted. Mineral processing systems for the production of gold, diamonds, copper, nickel, zinc and iron will be studied. Topics include decision-making process related to world market commodity pricing, mine planning and design, mining equipment, blasting and environmental considerations. Concepts of sustainability from economic, social and environmental perspective will be explored. Case studies, a major field trip and related assessment will be used to illustrate principles taught and how they are applied in a practical situation. (0/10/0/28/0)
			Ahmad Ghahreman	36 (LY33)	1 TA (60 hrs)	Preference will be given to applicants with an undergraduate degree in Mining, metallurgical or chemical Engineering and with a background in mineral processing.	Open	See Above
MINE202	<i>Computer Applications and Instrumentation in Mining Practice</i>	F	Oscar Rielo	36 (LY 36)	2 TA @ 60 hrs each	Must be familiar with and proficient in computer applications and instrumentation techniques as applied in mining. Preferred applicants must have taken at least an undergraduate course in instrumentation and measurement.	Open	This lab applies commonly used computer applications to mining engineering problems and conducts experiments with instrumentation used in surface and underground mining and mineral processing. A major field trip in conjunction with MINE 201 will be used to illustrate principles taught and how they are applied in mining operations. (0/0/0/24/12)
MINE321	<i>Drilling and Blasting</i>	F	Takis Katsabanis	41 (ly61)	1 TA (120 hrs)	Previous TA experience related to the subject matter.	Open	This course deals with the principles of commercial explosives technology and the application of blasting in mining and construction. The planning, design, economic considerations and trends of drilling and blasting practices in the different segments of the mining and construction industries are considered. Topics covered are detonation theory, performance and sensitivity of explosives, fragmentation prediction measurement and control, vibrations from blasting, air blast, damage and special blasting techniques used in perimeter blasting and blast design methods. (0/14/0/40/0)
MINE331	<i>Methods of Mineral Separation</i>	F	Sadan Kelebek	41 (ly58)	3 TAships (120 hrs each)	preference will be given to applicants with mineral processing/chemical engineering background and registered in the mineral processing area.	Open	Mineral separation processes of a physical and physicochemical nature are studied with laboratory sessions. Topics include size reduction, classification, flotation, flocculation, gravity concentration, magnetic, electrostatic separations and dewatering. Surface phenomena involving fine particle processing, reagent classifications, flotation machines and circuits, plant practice in ore flotation are discussed. The laboratory practice includes a design project on flotation circuit analysis and sizing. Assignments will be completed based on field trip observations. (0/10/0/38/6)
MINE339	<i>Mine Ventilation/Environmental Health Engineering</i>	F	Euler DeSouza	38 (ly53)	1 TA (90 hrs)	Previous experience and/or background in mine ventilation.	Open	Hydraulics of air flow through mine openings and ducts is first studied, leading to mine ventilation design calculations and ventilation network analysis. The engineering design, testing, selection and application of mine ventilation fans are studied in detail. Topics related to the design of mine ventilation systems include: statutory regulations and engineering design criteria, ventilation circuit design, natural ventilation, auxiliary ventilation design, psychometry, mine air heating and cooling, dust and fume control, and ventilation economics. Health hazards of mine gases, dust and radiation are reviewed, together with statutory requirements for air quality. Procedures for conducting air quantity, pressure and air quality surveys are also taught. (0/12/0/24/0)
MINE422	<i>Mining and Sustainability</i>	F	TBA	74 (ly80)	1 TA (90 hrs)	Previous experience and/or background in sustainability, systems thinking, community development, environmental and large scale mining issues and solutions.	Open	This course introduces the evolution of the principles of applied sustainability and their applications in the mining industry. Themes examined will include: the mining industry and society; the nature of the mining industry in Canada and around the world; the theory of sustainability and sustainable development; corporate social responsibility, reporting and assessment; mine closure; regulation of mine activities in Canada and elsewhere; mining and indigenous people in Canada and abroad; and future scenarios for the mining industry in North America. (0/0/18/9/9)

MINE 451	Chemical Extraction of Metals	F	Ahmad Ghahreman	26 (LY 27)	1 TA (60 hrs) Request to make this 90 hour for a TA to teach the Tutorial every week.	Undergraduate degree in Mineral processing or Chem Eng/Eng Chem. Basic understanding of thermodynamics as applied to metallic systems and knowledge of hydrometallurgical and pyrometallurgical processes.		The recovery and recycling of metals by both hydrometallurgical and pyrometallurgical techniques is discussed. The thermodynamic and kinetic aspects of the solutions utilized in these processes are reviewed. The major unit operations of the hydrometallurgical and pyrometallurgical processes are studied. For hydrometallurgy, the unit operations are; ion exchange, solvent extraction, cementation, purification, precipitation, electrowinning and electrorefining. Particular emphasis will be placed on the recovery of gold. For pyrometallurgy the unit operations are; roasting, agglomeration, calcination, smelting, converting, refining and electrolysis. In the course, the importance of environmental stewardship in metal extraction is stressed. (0/10/0/16/10)
MINE462	<i>Occupational Health and Safety in Mining Practice</i>	F	Mario Morin	74 (LY 70)	1 TA (60 hrs)	Previous experience and/or background in course topics	Open	Affirms a societal rationale and framework for due diligence in health, safety and environment (HS&E). Considers the five principal categories of workplace environmental factors that may lead to ill health / death, and introduces the principles (strategies and techniques) of exposure assessment (relative to both regulatory and professional standards) and control, as part of the Anticipation-Recognition-Evaluation-Communication-Control sequence. Enables the student to resolve, by means of memorandum, a specific topical occupational health issue. In addition to providing the basic tools for undertaking occupational health risk assessment / management, reviews fundamental chemical (non-toxicological) hazards and risk parameters. (0/0/12/0/0)
MINE467	<i>Geostatistics and Orebody Modeling</i>	F	TBA	50 (LY 45)	1 TA (60 hrs)	Previous experience and/or background in course topics; experience with Surpac software.	Open	This course introduces those principals of geostatistics used in evaluating grade distribution in orebodies from drillhole data. Basic concepts of spatial distributions, sampling, distance weighted averages, and variograms are covered. Cases from practice will be employed to illustrate concepts. Use of commercially available software to carry out geostatistical calculations and graphical representation will be made. Utilizing these techniques, students will develop a block model of ore grade distribution for an orebody and then apply this model to a mine pre-feasibility study in a subsequent course. (18/0/0/12/24)
MINE469	<i>Stability Analysis in Mine Design</i>	F	Steve McKinnon	50 (Ly 45)	1 TA (60 hrs)	Previous experience and/or background in course topics.	Open	Application of rock mechanics principles to mine design. Includes planning and execution of geotechnical investigation programs, empirical and analytical methods of stability analysis and support design. Numerical methods are introduced, with emphasis on how to choose among them for particular applications and how to evaluate results. Instrumentation programs are described. Methods are illustrated using case histories. (8/0/0/14/26)