



Cambrian College
Schools of Skills Training, Engineering
Technology & Environmental Studies
Course Outline

We acknowledge and respect that we are gathered on the traditional lands of the Anishnaabe People of Turtle Island and proudly recognize our local host Atikameksheng Anishnawbek. We also recognize the contributions of Wahnapiatae First Nation and the Metis Nation of Ontario.

Course Title	Introduction to Mining				
Course Code:	MNG1101	Credit Value:	3	Credit Hours:	42
Programs:	COMN Common Mining Engineering MNTN Mining Engineering Technician MNTY Mining Engineering Technology				
Equivalencies		Prerequisites		Corequisites	GOM1207

This course may be delivered in a variety of different formats: 100% in-class, 100% online (or a blend of both), videoconferencing, distributed learning or off-campus. Please confirm with your faculty member which format will be used for your section of this course.

General Education Course: Eligible for PLAR:

Degree Breadth Course: Experiential Learning:

Research Intensive Course Designation:

COURSE DESCRIPTION

In this course, students will acquire a basic understanding, and be able to describe primary operating functions, processes, and equipment utilized in Canadian surface and underground mining operations. Students will examine a number of common ore extraction and mine development techniques and will demonstrate that they understand basic mining industry concepts and terminology. Students will be able to solve simple grade control problems, productivity rates, and three dimensional problems.

Date: June 06, 2024

Approved by: 

ANGELA GILMORE
Interim Chair, School Of Engineering,
Schools Of Skills Training, Engineering
Technology & Environmental Studies

Effective: Fall 2024, Winter 2025, Spring 2025

RELATIONSHIP TO PROGRAM VOCATIONAL LEARNING OUTCOMES

PROGRAM LEVEL	
This course contributes to your program by allowing you to demonstrate the following vocational learning outcomes:	
Program(s)	Vocational Learning Outcomes
Mining Engineering Technician	<p>College Standards</p> <ol style="list-style-type: none"> 1. Perform all work in compliance with company policies/procedures, and federal, provincial and municipal requirements. 2. Communicate technical information accurately and effectively in oral, written, visual and electronic forms. 3. Contribute to tasks associated with short and long term projects. 4. Plan and implement mine layouts using computer assisted design and drafting tools. 5. Solve problems and perform routine tasks, using mathematical and scientific principles.
Mining Engineering Technology	<p>College Standards</p> <ol style="list-style-type: none"> 1. Perform and evaluate all work in compliance with company policies/procedures, and federal, provincial and municipal requirements. 2. Communicate technical information accurately and effectively in oral, written, visual and electronic forms. 3. Manage and lead short and long term projects. 4. Contribute to the plan and implementation of mine design layouts.

COURSE CURRICULUM

Topics/Concepts Covered in This Course

- Mine Safety - Regulations related to Mining
- Mining Terminology
- The Mine Life Cycle
- Overview of underground mining methods
- Overview of surface mining methods
- Constructing basic plans and sections
- Common surface and underground mining equipment
- Simple tonnage factors, specific gravity, and density calculation
- Basic mining economics, weighted averages, and ore grade calculation
- Introduction to productivity and process cycles
- Overview of mineral processing

COURSE LEVEL: Learning Outcomes and Objectives	
To earn credit for this course, you must reliably demonstrate your ability to:	
Learning Outcome	Objectives
1. Conduct internet research to access all mining related regulations.	1.1 Access the Mines Act and Safety Regulations for Mines and Mine Plants (Reg 854) to determine safety requirements for various mine site activities. 1.2 Select the applicable regulations to be applied for a given scenario.
2. Explain basic mining life cycle used in surface and underground mines.	2.1 Describe the various stages of the mine life cycle as they apply to both surface and underground mining operations. 2.2 Identify the various federal, provincial and local regulations, policies, etc. related to mine safety. 2.3 Identify and describe various underground development mining processes or methods. 2.4 Identify and describe various surface mining methods. 2.5 Create a flow diagram to explain the sequence of mine construction.
3. Explain and use common mining terminology.	3.1 Demonstrate the correct use of common mining terminology. 3.2 Identify the major components of surface and underground mines.
4. Discuss common equipment used in surface and underground mining.	4.1 Identify various surface and underground hoisting, haulage, production, and utility equipment. 4.2 Explain the uses of various surface and underground mine equipment.
5. Apply basic mine plans, mine sections, three dimensional concepts, and coordinate systems.	5.1 Demonstrate an appropriate level of understanding of information found on simple mine plans and sections. 5.2 Demonstrate the correct understanding of three dimensional concepts such as: strike, dip, trend, plunge, horizontal coordinates, and elevation. 5.3 Demonstrate the ability to transfer data from one orientation to another and to project directional trends.
6. Apply basic concepts of ore, waste, dilution, tonnage, grade calculation, and profitability.	6.1 Define ore, waste and dilution. 6.2 Calculate simple tonnage and weighted ore grade calculations. 6.3 Calculate the value of ore, cut-off grade, and simple profit/loss problems.

Learning Outcome	Objectives
7. Describe the various stages in mining processes along with the concepts of sequencing, productivity, and cycles.	7.1 Identify individual tasks in haulage, production, development and hoisting processes. 7.2 Explain basic sequencing of tasks in a process. 7.3 Define a unit cycle in a process and calculate cycle duration. 7.4 Calculate unit and durational productivities.
8. Describe the basics of mineral processing for a variety of mineral commodities.	8.1 Describe the basic flowchart for the processing of gold ore using CIP (or a relevant) method. 8.2 Describe the basic flowchart for the processing of base metal ore including flotation, thickeners, filtering. 8.3 Describe the basic flowchart for the processing of diamonds including x-ray separation. 8.4 Describe the basic flowchart for the processing of potash or other soft-rock ore. 8.5 Describe the basic flowchart for the processing of any mineral commodity of significance (if time permits).

Essential Employability Skills

Communication

- communicate clearly in written, spoken, and visual form that fulfills purpose/ needs of audience.
- respond to written, spoken, or visual messages in a manner that ensures effective communication.

Numeracy

- execute mathematical operations accurately.

Critical Thinking and Problem Solving

- apply a systematic approach to solve problems.

Information Management

- locate, select, organize, and document information using appropriate technology and info systems.

Interpersonal

- show respect for the diverse opinions, values, belief systems, and contributions of others.
- interact with others in groups in ways that contribute to effective working relationships.

Personal

- manage the use of time and other resources to complete projects.
- take responsibility for one's own actions, decisions, and consequences.

Delivery Method

- Classroom: Course is delivered through scheduled synchronous teaching that may be face-to-face and/or virtual.

Learning Activities

- Lectures
- Labs
- Research
- Presentations
- Guest Speaker(s)
- In-Class Exercises
- Field Trip(s)

Resources Required

Books

Robert Stevens, *Mineral Exploration and Mining Essentials*, Second, Pakawau GeoManagement Inc. (www.miningessentials.com)
 ISBN: 978-0-9867221-0-3

Additional Supplies

Scientific Calculator

Do not purchase before talking to professor: log, trig, statistics, d-m-s to decimal degree conversion, c/w instruction manual

Drafting Equipment

Do not purchase before talking to professor: 2H pencils, 30-60 degree set square, 45 degree set square, navigational protractor, and triangular scales (Metric and Imperial). Est cost = \$160.00

Personal Protective Equipment (PPE)

Do not purchase before talking to professor common underground/surface PPE consisting of: coveralls with reflective stripes; underground hard hat with reflective buttons, ear muffs and cap lamp holder; mining belt with lamp strap and D-ring; mucker boots; gloves (in good condition); safety glasses with clear (not tinted) lenses; duffle or large sport bag to carry/store PPE in. Estimated cost approx. \$650 new. Checklist will be issued.

Reflective Safety Vest

Do not purchase before talking to professor: high visibility vest for outside work and field trips. Required within two weeks of start of semester.

Evaluation Plan

Grading Scheme

A	80% - 100%
B	70% - 79%
C	60% - 69%
D	50% - 59%
F	0% - 49%

Evaluation Method	Value (%)
Applied Activities (G)	50%
Ten (10) Applied Activities of equal value. Marking guides/rubrics will be provided for each. One activity will be associated with the CIM-Sudbury Branch - Student Night Event.	

Evaluation Method	Value (%)
Test/Exam	30%
Two theory tests of equal value.	
Quizzes	10%
Ten (10) Terminology quizzes of equal value to be written during lab block.	
Professional Conduct	10%
Theory = 5%, Lab = 5%. Assessment of ethical and behavioural skills related to employment success. Includes punctuality, deportment, preparedness, accepting and providing feedback, communication, and participation.	

ADDITIONAL INFORMATION

A course outline is the College's commitment to the students. It supports educators, students, employers and other external stakeholders in determining the depth of knowledge and level of performance that a student will be able to demonstrate upon successful completion of a course. Both instructor and student are obligated to follow the content of the course outline. It is your responsibility to meet these outcomes as assigned.

Note: You should maintain a copy of this course outline for your records. You may require this course outline if you seek transfer credits or further studies at other institutions.

Cambrian Email Addresses

All email correspondence with currently registered students must be via the students' College-issued email, as per the College's [IT Acceptable Use Policy](#). Students must familiarize themselves with the IT Acceptable Use Policy, as it outlines the acceptable use of College information systems and technology, and mitigates risks to the College's IT infrastructure.

Bring Your Own Device (BYOD) and Apps Anywhere

Cambrian College is a BYOD institution, which means that students bring the device of their choice that meets program-specific minimum requirements. Program-specific requirements can be viewed in the "Plan Your Future" section on program web pages. AppsAnywhere is an easy-to-use app store-like platform providing students a way to access their College apps and software on demand, anywhere, anytime both on and off campus.

These both enrich the student learning experience in and out of the classroom, while providing maximum flexibility.

Policies

It is the student's responsibility to be aware of the College's [Academic Policies](#). The Academic Policies apply to all applicants to Cambrian and all current students enrolled in any program or course offered by Cambrian, in any location. Academic policies, procedures, and forms can be found on the Cambrian website.

Academic and Student Services

Cambrian has a variety of student and academic services to support students during their academic journey at the College.

- [Academic Success Centre](#)
- [Bookstore and Campus Store](#)

- [International Student Support Services](#)
- [KPMG Pride Centre](#)
- [Career Centre](#)
- [Registrar's Office \(Enrolment Centre\)](#)
- [First Step Centre](#)
- [Accessibility Services](#)
- [Library](#)
- [Pathways](#)
- [Available Scholarships and Bursaries](#)
- [Cambrian Student Council \(CSC\)](#)
- [Cambrian Indigenous Student Circle \(CISC\)](#)
- [Cambrian Athletic Association \(CAA\)](#)
- [Student Life Centre](#)
- [Test Centre](#)
- [The Learning Centre \[Tutoring Services\]](#)
- [Wabnode Centre for Indigenous Services](#)
- [Women's Resource Centre](#)

Copyright

Copyright is the exclusive legal right given to a creator to reproduce, publish, sell, or distribute his/her work. All members of the Cambrian community are required to comply with Canadian copyright law, which governs the reproduction, use and distribution of copyrighted materials. This means that the copying, use and distribution of copyright-protected materials, regardless of format, are subject to certain limits and restrictions. For example, photocopying or scanning an entire textbook is prohibited, nor is uploading class materials to course sharing sites.

See the [Cambrian Library website](#) for additional information regarding copyright and for details on allowable limits.

Audio/Visual Capture

Sounds and images from this class, and contributions made by a participant, virtually or in-person, are recorded under the authority of the Ontario Colleges of Applied Arts and Technology Act, 2002. The main purpose of these recordings is to allow students enrolled in the course to review content and engage in activities, whether they attend any given class in person, virtually, or at all. Class recordings are for personal use only and shall not be shared or transferred. Faculty may also review these recordings to prepare for future classes, evaluate students, collaborate in program reviews, or provide feedback to faculty and/or students. Any questions about the use of multimedia recordings may be addressed to your respective Dean.

Equity, Diversity, and Inclusivity

Cambrian is committed to building and preserving an equitable, diverse, and inclusive learning community where students, faculty, and staff may achieve their full potential in an environment characterized by equality of respect and opportunity. All students and employees have the right to live and work in an environment that is free from discrimination and harassment. Therefore, Cambrian College will not tolerate any form of discrimination or harassment in its employment, education, accommodation, or business dealings. For more information, please visit: [Equity, Human Rights, and Accessibility](#).

Prior Learning Assessment and Recognition (PLAR)

Students wishing to have work or life experience that meets course learning outcomes considered for credit through Prior Learning Assessment and Recognition should contact the [Pathways Office](#).

Transfer Credit

Students wishing to have courses from other programs or institutions assessed for equivalency and/or transfer credit should visit the [Transfer Credits page](#) on the Cambrian website. The student should maintain a copy of this course outline for their records. Students may require this course outline if seeking transfer credits or further studies at other institutions.

Test Proctoring at Cambrian

Many courses include major tests and/or final exams. The practice at Cambrian requires that these types of test situations involve proctoring to ensure academic integrity. Online tests/exams may employ a proctoring services to enable you to take your exam from a location of your choosing within a period specified by your instructor. When you are taking an online test/exam, the proctoring service may capture your video, screen, audio, and web surfing data to protect academic integrity. Cambrian College collects, uses, discloses, and retains personal information in compliance with the Freedom of Information and Protection of Privacy Act (FIPPA). Your personal information is being collected under the authority of the Ontario Colleges of Applied Arts and Technology Act S.O. 2002, c.8, Sched. F. This information will be used for the purpose of administering a test/exam through an online proctoring service acting as an authorized agent of the College. Please refer to Cambrian's [Official Student Records Policy](#) for more details. If you have any questions regarding the collection of your personal information, please contact Vice President Academic, Cambrian College, 1400 Barry Downe Rd., Sudbury ON P3A 3V8, 1-705-566-8101 ext. 6245.

Schools of Skills Training, Engineering Technology & Environmental Studies Regulations**Lab Attendance**

This course includes a mandatory lab component. The grading in this course will include the evaluation of lab reports and performance during labs.