

APPLIED SCIENCE AND MANAGEMENT DIVISION

GEOL 203  
School of Science  
Fall, 2018



COURSE OUTLINE

GEOL203

UNDERGROUND AND SURFACE MINING METHODS

1.5 CREDITS

PREPARED BY: Joel Cubley, Instructor

DATE: June 1, 2018

APPROVED BY: Margaret Dumkee, Dean

DATE: June 1, 2018

APPROVED BY ACADEMIC COUNCIL: May 2014

RENEWED BY ACADEMIC COUNCIL: August 2017



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The Course Outline Template is approved by the Academic Council on June 20, 2018.

**UNDERGROUND AND SURFACE MINING METHODS**

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**INSTRUCTOR:** Dr. Joel Cubley**OFFICE HOURS:** F (2:30-4:30-pm)**OFFICE LOCATION:** T1090**CLASSROOM:** T1090**E-MAIL:** jcubley@yukoncollege.yk.ca**TIME:** F (1-2:30 pm)**TELEPHONE:** (867) 456-8605**DATES:** Sept. 5 - Dec. 20, 2018

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**COURSE DESCRIPTION**

This course provides an introduction to underground and surface mining methods and covers a broad range of topics including, but not limited to, the following: mining method selection, design, and operation; method-specific equipment and infrastructure; and pit/stope progressive reclamation strategies. Factors governing the decision to pursue surface versus underground mining are examined, including geologic variables such as overburden characteristics, ore and host rock strength, ore body geometry, and stripping ratios. Students are introduced to different types of surface mines including open pits, placer operations and quarries, as well as common underground mine excavation designs. Ground control, dewatering techniques, and mine ventilation fundamentals are presented. Students are introduced to blasting theory and design used in surface and underground mining operations. Case studies from operating and historic Yukon mines are used to lend a northern perspective.

**PREREQUISITES**

Successful completion of GEOL 112 (Mining Industry Overview), OR permission from the instructor.

**EQUIVALENCY OR TRANSFERABILITY**

In Progress.

**LEARNING OUTCOMES**

Upon successful completion of the course, students will be able to

- describe the relationship between a chosen mining method and the form and geometry of an ore body, as well as the geologic environment in which it is hosted

- identify the mining method most appropriate for ore extraction from a given deposit based on consideration of cost and market conditions, ore grades and stripping ratios, access, environmental limitations, and available infrastructure
- describe the operating cycle for underground and surface operations, as well as development stages and production scheduling
- demonstrate an understanding of the application and safe practices of blasting at surface and underground workings in different geologic environments and mine designs
- identify fundamental infrastructure requirements for underground and surface mines such as infrastructure relating to ventilation, rock support, dewatering, and hauling and hoisting

## COURSE FORMAT

This course will be delivered in an online format utilizing the EduMine course platform. The portal for these courses is the Yukon College EduMine campus page ([www.edumine.com/campuses/yukon-college-centre-for-northern-innovation-in-mining/](http://www.edumine.com/campuses/yukon-college-centre-for-northern-innovation-in-mining/)). All students registered in GEOL203 should have authorized access to all EduMine courses. On the YC EduMine campus page, click the grey “Yukon College Centre for Northern Innovation in Mining Users Join Today” button for one-time registration. Make sure you use the email address that the instructor has on file for you! After that, use the login credentials you supplied to access your course content via the Sign In button.

## ASSESSMENTS

### Online course assessments

You will be required to complete all or part of four courses of varying length on EduMine. Each course has built-in assessments that you must complete to continue on with the course. The results of these assessments are visible to the course instructor, and you must achieve an overall passing grade on the sum of all assessments to pass the course.

*Note: You must register for certification for the desired course before you can be assessed. On the individual course’s homepage, click Register for Certification for a one-time certification process. Every time after that, you can click the Enter the Course button to access your coursework.*

## Assignments

Four classroom exercises will be conducted during the regularly scheduled GEOL203 class time. These exercises will be practical applications of the theory you've learned online, and require you to have previously completed that online component. Your instructor will give you advance notice about when these exercises will be conducted. Be aware that these exercises may not always be fully completed in the 1.5-hour time slot - typically, completion will require an additional 1-2 hours of time.

## Tests

There are no exams for this course.

## EVALUATION

Metrics	Weight	Due Date
Online assessments	80% (20% per course)	Assessment completion required at completion date for each course (see schedule below).
In-class reinforcement activities	20%	Due at the conclusion of each class period (4 total assignments/activity dates).
<b>Total</b>	<b>100%</b>	

## REQUIRED TEXTBOOKS AND MATERIALS

There is no required textbook for this course. Students may be required to draw on a number of key resources available on reserve at Yukon College Library. These include but are not limited to the following resources:

Darling P, editor. 2011. SME mining engineering handbook. 3<sup>rd</sup> ed. Englewood (CO): Society for Mining, Metallurgy, and Exploration. 1046 p.

Hartman HL, Mutmanský, JM. 2002. Introductory mining engineering. 2<sup>nd</sup> ed. Mississauga (ON): John Wiley and Sons. 584 p.

Spitz K, Trudinger J. 2008. Mining and the environment: from ore to metal. New York (NY): CRC Press. 900 p.

## ACADEMIC AND STUDENT CONDUCT

Information on academic standing and student rights and responsibilities can be found in the current Academic Regulations that are posted on the Student Services/ Admissions & Registration web page.

## PLAGIARISM

Plagiarism is a serious academic offence. Plagiarism occurs when a student submits work for credit that includes the words, ideas, or data of others, without citing the source from which the material is taken. Plagiarism can be the deliberate use of a whole piece of work, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material according to an accepted manuscript style (e.g., APA, CSE, MLA, etc.). Students may use sources which are public domain or licensed under Creative Commons; however, academic documentation standards must still be followed. Except with explicit permission of the instructor, resubmitting work which has previously received credit is also considered plagiarism. Students who plagiarize material for assignments will receive a mark of zero (F) on the assignment and may fail the course. Plagiarism may also result in dismissal from a program of study or the College.

## YUKON FIRST NATIONS CORE COMPETENCY

Yukon College recognizes that a greater understanding and awareness of Yukon First Nations history, culture and journey towards self-determination will help to build positive relationships among all Yukon citizens. As a result, to graduate from ANY Yukon College program, you will be required to achieve core competency in knowledge of Yukon First Nations. For details, please see [www.yukoncollege.yk.ca/yfnccr](http://www.yukoncollege.yk.ca/yfnccr).

## ACADEMIC ACCOMMODATION

Reasonable accommodations are available for students requiring an academic accommodation to fully participate in this class. These accommodations are available for students with a documented disability, chronic condition or any other grounds specified in section 8.0 of the Yukon College Academic Regulations (available on the Yukon College website). It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, he/she should contact the Learning Assistance Centre (LAC) at (867) 456-8629 or [lac@yukoncollege.yk.ca](mailto:lac@yukoncollege.yk.ca).

## THE LORENE ROBERTSON WRITING CENTRE

All students are encouraged to make the Writing Centre a regular part of the writing process for coursework. The Lorene Robertson Writing Centre is staffed by

helpful writing coaches from across the College and offers one-on-one appointments to students in need of writing support.

The Lorene Robertson Writing Centre can help you:

- Get started on an assignment and focus your ideas
- Outline and plan your assignment
- Write clearly, logically and effectively
- Address specific needs and writing problems
- Revise the first and final drafts of your project
- Gain confidence in your writing

For in-person appointments, the Centre coaching office is located in the Academic Support Centre in room A2302. You can also participate in coaching appointments over the phone or online. see the Academic Support Centre schedule for English and writing support times.

## TOPIC OUTLINE

Modules	EduMine Course	Due Date
1,2,3	Underground Mining Methods and Equipment	<i>September 28th</i>
All	Mine Ventilation 2 (Hazard Awareness) and 3 (Design Basics)	<i>October 19<sup>th</sup></i>
All	Guidelines for Open Pit Slope Design I. Fundamentals and Data Collection II. Modelling III. Design	<i>November 9<sup>th</sup></i>
1,2,3	Blast Design and Assessment for Surface Mines and Quarries	<i>November 30<sup>th</sup></i>