

	School of Science
	GEOL 112
	Introduction to the Mineral Exploration and Mining Industries
	Term: Winter 2025 Number of Credits: 3
Course Outline	

INSTRUCTOR: Dr. Chad Morgan

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OFFICE LOCATION: T1084

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OFFICE HOURS: Drop-in and by appointment

INSTRUCTION TIMES: Tuesday and Thursday 9:00 – 10:20 am.

COURSE DESCRIPTION

This course traces the mineral resource sector from grassroots mineral exploration through to underground and open-pit extraction and the processing and marketing of mining products. The environmental impact of mining and sustainable mining techniques are introduced, as well as monitoring and remediation techniques that follow mine closure. This course also provides an introduction to First Nations in the Yukon and the history, land agreements, and regulations that influence their relationship with the mining industry.

Guest speakers supplement course curriculum with local expertise and raise awareness of active projects and industry developments in Yukon. GEOL 112 serves as a valuable foundation for students and practitioners in a wide range of science and policy fields that require a base-level of understanding concerning the mining industry.

COURSE REQUIREMENTS

There are no prerequisites for this introductory course.

EQUIVALENCY OR TRANSFERABILITY

Receiving institutions determine course transferability. Find further information at:

<https://www.yukonu.ca/admissions/transfer-credit>

LEARNING OUTCOMES

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

- Identify the various stages in the mining cycle, from exploration to mineral extraction and refinement, to mine closure and remediation. Students should be able to demonstrate an understanding of the requirements for technical and environmental studies that bridge these segments of the mine cycle.
- Compare and analyse different methods of extracting minerals in both surface and underground mining operations and describe the subsequent processing techniques that separate and refine ore.
- Describe how metals and industrial minerals are sold into the marketplace, as well as the factors involved in setting mineral prices. In addition, students should be able to demonstrate an understanding of how companies raise capital to fund mining activities.
- Describe the main issues surrounding closure and reclamation of a mine site and be able to apply that knowledge to make preliminary recommendations for currently active mining operations.
- Identify the primary characteristics of main deposit types and the ore minerals generally associated with those deposits.
- Assess the impact of mining operations on the natural and human environment and describe the main sources of environmental pollution.
- Demonstrate a fundamental awareness of the interplay between mining companies and Yukon First Nations, and the rights and responsibilities of both partners.

COURSE FORMAT

Weekly breakdown of instructional hours

This course consists of two 80-minute lectures per week. The lecture schedule included in this outline provides the major topics covered. Please note that this schedule is subject to change at the course instructor's discretion. Students can expect to spend an additional 2-3 hours per week on background reading and course assignments, with additional time required for exam preparation. It is important to note that these are time estimates, and the actual time required to complete coursework will vary by individual.

Delivery format

Lectures for the Winter 2025 course offering will be delivered in-person at the Ayamdigut (Whitehorse) Campus. Lecture slides, course resources, and assignments will be provided on the Moodle Course page. Students are expected to attend lectures during scheduled class time so that they can ask questions and directly engage with the instructor and their peers. Lectures will not be recorded. Review of any missed material or completion of missed activities is the responsibility of the student.

EVALUATION

Theory Quizzes (open book)	25% (5% each)
Midterm Examination	25%
Current Events in Mining Podcasts	20% (10% each)
Final Examination	30%
Total	100%

Assignments

Five (5) theory quizzes based on assigned readings will be conducted over Moodle during the course which are intended to reinforce the concepts introduced in lecture and supported by the assigned readings. These quizzes are open-book and are designed to help students prepare and study for the midterm and final examinations. Students will also prepare two recorded podcast-style presentations on mining-related topics approved by the instructor which will be uploaded to Moodle for the class. All students are expected to listen to their colleagues' podcasts and material from these podcasts may be used in subsequent quizzes or exams.

Late assignments will be graded based on the following scheme: a deduction of 10% per day up until a total deduction of 50% is reached, following that, assignments must be submitted prior to the date that the instructor hands back the graded assignment (set by the instructor), unless otherwise indicated by the instructor.

Exams

This course has two exams: a midterm exam and a final exam. The midterm exam (1.5 hrs) is conducted during scheduled lecture time; the final exam (3 hrs) is conducted during the final exam period scheduled by the Office of the Registrar.

Missed exams will be assigned a grade of 0% unless re-scheduling for a valid reason is approved and determined in advance of the scheduled exam date. If there are known conflicts with exam scheduling, please see the instructor as soon as possible to discuss an alternative examination date. Please note that excuses such as car trouble, vacation travel, oversleeping, and misreading the exam schedule are not considered legitimate reasons and will not qualify a student for a deferred exam.

COURSE WITHDRAWAL INFORMATION

Refer to the YukonU website for important dates.

TEXTBOOKS & LEARNING MATERIALS

Required Textbook:

Stevens, Robert. 2019. *Mineral Exploration and Mining Essentials* (2nd edition). Pakawau GeoManagement Inc. (www.miningessentials.com)

The textbook is available for purchase online from the publisher (website link above) and from online booksellers such as Amazon.

ACADEMIC INTEGRITY

Students are expected to contribute toward a positive and supportive environment and are required to conduct themselves in a responsible manner. Academic misconduct includes all forms of academic dishonesty such as cheating, plagiarism, fabrication, fraud, deceit, using the work of others without their permission, aiding other students in committing academic offences, misrepresenting academic assignments prepared by others as one's own, or any other forms of academic dishonesty including falsification of any information on any Yukon University document.

Please refer to Academic Regulations & Procedures for further details about academic standing and student rights and responsibilities.

ACCESSIBILITY AND ACADEMIC ACCOMMODATION

Yukon University is committed to providing a positive, supportive, and barrier-free academic environment for all its students. Students experiencing barriers to full participation due to a visible or hidden disability (including hearing, vision, mobility, learning disability, mental health, chronic or temporary medical condition), should contact [Accessibility Services](#) for resources or to arrange academic accommodations: access@yukonu.ca.

Theory Quiz Completion Dates

Number	Theory Moodle Quiz	Completion Date
1	Chapters 2 & 3: Geology and Mineral Deposits	Jan. 31
2	Chapter 4: Mineral Exploration	Feb. 14
3	Chapters 5 & 6: Mineral resources, reserves and mining technical studies	Mar. 28
4	Chapters 7: Mineral processing	Apr. 4
5	Chapter 8: Environmental considerations	Apr. 11

TOPIC OUTLINE

Week	Date	Lecture	Lecture Topics	Required Readings
1	Jan. 7	1	Introduction to the course and Industry Overview	Ch. 1 (pp. 1-13)
	Jan. 09	2	Industry Overview and Intro to Geology	
2	Jan. 14	3	Intro to Geology	Ch. 2 (pp. 15-37)
	Jan. 16	4	Mineral Deposits I	Ch. 3 (pp. 47-108)
3	Jan. 21	5	Mineral Deposits II	
	Jan. 23	6	Mineral Deposits III	
4	Jan. 28	7	Yukon Geology and Mineral Deposits	<i>Moodle Resources</i>
	Jan. 30	8	Mineral Exploration I	Ch. 4 (pp. 113-167)
5	Feb. 4	9	Mineral Exploration II	
	Feb. 6	10	Mineral Exploration III	
6	Feb. 11	11	TBD	
	Feb. 13	Midterm Exam Review		
7	Feb. 18	Reading Break (no classes)		
	Feb. 20			
8	Feb. 25	Midterm Exam		
	Feb. 27	12	Mineral Resources and Reserves, and Mining Technical Studies	Ch. 5 (pp. 170-197)
9	Mar. 4	13	Mineral Resources and Reserves, and Mining Technical Studies	
	Mar. 6	14	Yukon technical reporting and governing bodies	<i>Moodle Resources</i>
10	Mar. 11	15	Mining I	Ch. 6 (pp. 199-229)
	Mar. 13	16	Mining II	
11	Mar. 18	17	Mining III	Ch. 7 (pp. 230-251)
	Mar. 20	18	Mineral Processing I	
12	Mar. 25	19	Mineral Processing II	
	Mar. 27	20	Environmental Considerations I	
13	Apr. 1	21	Environmental Considerations II	
	Apr. 3	22	TBD	
14	Apr. 8	23	TBD	
	Apr. 10	Final Exam Review		