

	School of Science
	GEOL 106
	Historical Geology
	Term: Winter, 2024 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: Lectures on Tuesday 1:00 – 2:20 pm (Room A2603) and Thursday 1:00 – 2:20 pm (Room A2406); Labs on Wednesday 1:00 – 3:50 pm (Room T1090)

COURSE DESCRIPTION

GEOL 106 examines Earth’s history from initial formation through to the present-day using evidence found in the geologic record; as well as the corollary development of geological thought and understanding in both Western and indigenous worldviews. The course covers three main themes in Earth history: 1) the concept of deep time; 2) the evolution of plate tectonics; and 3) the biological evolution of Earth using evidence from the fossil record. The growth of the continents, the opening and closing of ocean basins, episodes of large-scale erosion and deposition on the continents, and orogenic (mountain-building) episodes are fundamental geologic topics covered in this course. Students will develop competencies in measuring geologic time using the application of stratigraphic principles, palaeontology and radioactive decay.

Life on Earth during the major geological time periods is discussed with a focus on significant evolutionary developments and mass extinctions. Plate tectonics, climate, and relative sea-level are examined as determinants of evolutionary change with particular reference to North America and Western Canada.

This course is designed to provide, in tandem with GEOL 105 (Physical Geology), the first-year geology courses required to enter the second year of a B.Sc. geology program at most institutions.

COURSE REQUIREMENTS

There are no prerequisites for this 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:

- Demonstrate knowledge and proper use of the geologic time scale, as well as understanding of the history of its development.
- Describe indigenous perspectives on geologic history, with a specific focus on northwestern Canada. Demonstrate how western scientific perspectives and indigenous oral traditions have contextualized the same geologic developments through different lenses.
- Demonstrate understanding of the suite of geologic principles used to analyze Earth history and apply those principles to evaluate and interpret the geologic history of specific localities in western Canada.
- Summarize how Earth's continents and oceans evolve over geologic time and relate this to specific evidence preserved in the rock record.
- Describe the relationships between plate tectonics and the evolution/extinction of life on Earth, from first life through to the present-day.
- Identify a variety of invertebrate fossils and discuss how they contribute to 1) geologists' understanding of life during specific geologic time periods and 2) interpretations of Earth history.
- Summarize the key sedimentological, paleoclimatic, tectonic, and biological lines of evidence that have been used to interpret the history of Earth with a focus on North America and western Canada in particular.

COURSE FORMAT

Weekly breakdown of instructional hours

This course consists of two 90-minute lectures and one 3-hour laboratory period per week; laboratory activities are complimentary to lecture material. Please note that the course schedule will likely be modified during the term to accommodate lecture topics that may not be finished within the predicted lecture time.

Delivery format

Lectures and labs for the Winter 2024 offering of this course will be delivered in a face-to-face setting (classroom and laboratory). Lectures will be held in rooms A2603 (Tuesdays) and A2406 (Thursdays); the lab will be held in room T1090 on the Ayamdigut (Whitehorse) campus. Students are expected to attend each lecture and lab session so that they can ask questions and directly engage with the instructor and their peers. Lecture slides, laboratory instructions, and worksheets will be provided digitally on the Moodle course page. Lectures will not be recorded. Review of any missed material or completion of missed activities is the responsibility of the student. Midterms and exams will be delivered on the Ayamdigut campus.

EVALUATION

Weekly Lab Assignments	30 % (10 at 3% each)
Midterm Examination	25 %
Final Examination	35 %
Learning Assignments	10 % (2 at 5 % each)
Total	100%

Assignments

This course includes ten laboratory exercises that are due one week from the initial laboratory activity unless otherwise indicated by the instructor. Successful completion of these exercises is critical for understanding and reinforcing lecture material. Two learning assignments will be assigned during course progression. The instructor may also assign in-class or take-home activities throughout the semester to supplement lecture materials.

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).

Examinations

This course has two lecture examinations: a midterm and a final. 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 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.

Late Policy

Any assignments (lab and lecture) submitted past the due date 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). Any variation from this late policy, for example, where late assignments will not be accepted, will be clearly communicated by the instructor.

COURSE WITHDRAWAL INFORMATION

Refer to the YukonU website for important dates.

TEXTBOOKS & LEARNING MATERIALS

Required Textbook:

Fensome, R., Williams, G., Achab, A., Clague, J., Corrigan, D., Monger, J., & Nowlan, G. (eds.) 2014. *Four Billion Years and Counting: Canada's geological heritage* (1st edn.). Nimbus Publishing and the Canadian Federation of Earth Sciences, 402 pp. ISBN: 978-1-55109-996-5.

The required textbook is available at the Ayamdigut Campus bookstore and can also be purchased online at retail sellers including Amazon.ca and Chapters-Indigo.

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.

TOPIC OUTLINE

<i>Week</i>	<i>Date</i>	<i>Lecture</i>	<i>Lecture Topics</i>	<i>Recommended Readings</i>
1	Jan. 4	1	Introduction to the course and geology overview	Ch. 1 – 2
2	Jan. 9	2	Geologic Principles and the Sedimentary Rock Record	Ch. 3
	Jan. 11	3	Deep Time and development of the Geologic Time Scale	
3	Jan. 16	4	Fundamentals of Palaeontology	Ch. 4
	Jan. 18	5	Fundamentals of Palaeontology II	
4	Jan. 23	6	Hadean Eon and Cosmology: Origin of the Universe, Solar System, and Earth	Ch. 5
	Jan. 25			
5	Jan. 30	7	Archean Eon I	Ch. 6 – 7
	Feb. 1	8	Archean Eon II	
6	Feb. 6	9	Proterozoic Eon I	Ch. 6 – 7
	Feb. 8	10	Proterozoic Eon II	
7	Feb. 13	11	Early Paleozoic Era I	Ch. 6 – 7
	Feb. 15	Midterm Exam Review		
8	Feb. 20	Reading Break (no classes)		Ch. 6 – 7
	Feb. 22	Reading Break (no classes)		
9	Feb. 27	Midterm Exam		Ch. 8
	Feb. 29	12	Early Paleozoic Era II	
10	Mar. 5	13	Late Paleozoic Era III	Ch. 8
	Mar. 7	14	Late Paleozoic Era IV	
11	Mar. 12	15	Mesozoic Era I	Ch. 9
	Mar. 14	16	Mesozoic Era II	
12	Mar. 19	17	Mesozoic Era III	Ch. 10 – 11
	Mar. 21	18	Cenozoic Era I	
13	Mar. 26	19	Cenozoic Era II	Ch. 10 – 11
	Mar. 28	20	Yukon through time	
14	Apr. 2	21	The Anthropocene debate, a new epoch?	Ch. 18, 20
	Apr. 4	22	TBD	
15	Apr. 9	Final Exam Review		