Yukon University	**School of Science**
	GEOL 106 **Historical Geology**
	Term: Winter, 2026 **Number of Credits: 3**

Course Outline

INSTRUCTOR: Dr. Chad Morgan
E-MAIL: cmorgan@yukonu.ca **PHONE:** (867) 456-8570
OFFICE LOCATION: T1084 **OFFICE HOURS:** drop-in and by appointment

INSTRUCTION TIMES: Lectures Tuesday and Thursday 1:00 – 2:20 pm (Room A2202); and Labs 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 80-minute lectures and one 3-hour laboratory period per week; laboratory activities are complimentary to lecture material. 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 and labs for the Winter 2026 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

Weekly Lab Assignments (10)	30 % (3% each)
Learning Assignments (2)	10 % (5 % each)
Midterm Examination	25 %
Final Examination	35 %
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. Two learning assignments will be distributed at scheduled intervals during the course. These assignments will focus on topics in historical geology. 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 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:

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 textbook is available online at retail sellers including Amazon.ca, Chapters-Indigo, and the publisher (https://nimbus.ca/store/four-billion-years-and-counting.html).

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.

LABORATORY TOPIC OUTLINE

Week	***Topic***
2	Principles of numerical and relative age-dating and geologic map interpretation
3	Introduction to fossils and ancient life
4	Fossil symmetry and life habit
5	Introduction to palaeoenvironmental interpretation and ichnology
6	Introduction to evolution and taxonomy
7	Paleozoic invertebrate fossils and biostratigraphy
11	Paleozoic and Mesozoic reef palaeoecology
12	Introduction to palaeobotany and extinction: The Upper Cretaceous McLeod & Eocene McAbee sample suites
13	Introduction to the chordate fossil record
14	Introduction to ethnogeology

**Lab Schedule subject to change at Instructor's discretion*

TOPIC OUTLINE*

Week	*Date*	*Lecture*	*Lecture Topics*	*Textbook Readings*
1	Jan. 6	1	Course Introduction & Intro to Geology I	Ch. 1 – 2
	Jan. 8	2	Intro to Geology II	
2	Jan. 13	3	Stratigraphic Principles and the Sedimentary Rock Record	Ch. 3
	Jan. 15	4	Deep Time and development of the Geologic Time Scale	
3	Jan. 20	5	Fundamentals of Palaeontology I	Ch. 4
	Jan. 22	6	Fundamentals of Palaeontology II	
4	Jan. 27	7	Hadean Eon and Cosmology – origin of the universe, solar system, and Earth	Ch. 5
	Jan. 29	8	Archean Eon I	
5	Feb. 3	9	Archean Eon II – Earliest evidence of life	
	Feb. 5	10	Evolution and Taxonomy I	
6	Feb. 10	11	Evolution and Taxonomy II	
	Feb. 12	12	Proterozoic Eon I	Ch. 6 – 7
7	Feb. 17	13	Proterozoic Eon II	
	Feb. 19	14	Proterozoic Life – From microscopic to macroscopic	
8	Feb. 24	15	Palaeozoic Life I – Marine invertebrates	Ch. 7 – 8
	Feb. 26	16	Palaeozoic Life II – Rise of tetrapods	
9	Mar. 3	17	Palaeozoic Life III – Arrival of plants	
	Mar. 5	Midterm Review Session		
10	Mar. 10	Reading Break (no classes)		
	Mar. 12			
11	Mar. 17	Midterm Exam *(in class)*		
	Mar. 19	18	Paleozoic Era – Assembling Pangaea	Ch. 8
12	Mar. 24	19	Mesozoic Life I – Marine realm	Ch. 9
	Mar. 26	20	Mesozoic Life II – Terrestrial realm	
13	Mar. 31	21	Mesozoic Era – End of the Pangaea party	
	Apr. 2	22	Cenozoic Era	Ch. 10 – 11
14	Apr. 7	23	Cenozoic Life	
	Apr. 9	24	The Anthropocene debate, a new epoch?	Ch. 18, 20
15	Apr. 14	25	TBD	
	Apr. 16	Final Exam Review Session		

**Lecture Schedule subject to change at Instructor's discretion*