



GEOL-106 – Physical and Historical Geology

University Arts and Science

Effective Term & Year: Fall 2023

Course Outline Review Date: 2028-04-01

Program Area: Math and Sciences

Description:

This course is an introduction to the major principles of structural and historical geology. Historical geology topics include geologic time, relative and absolute dating techniques, organic evolution, the study of fossils and the geologic history of the earth from the Precambrian to the present. Mineral deposits and natural resource issues will also be examined.

Program Information:

This course is intended for University Studies and Business Management diploma and degree students. It can also be used as an elective for BMGT diplomas and the Bachelor in Business Administration (Sustainable Business Practices) degree.

Delivery Methods: On-campus (Face-to-Face)

Credit Type: College of the Rockies Credits

Credits: 3

Course type/s: Sciences, Lab Sciences

Instructional Activity and Hours:

Activity	Hours
Classroom, Directed Studies or Online Instruction	45
Seminar/Tutorials	

Laboratory/Studio	45
Practicum/Field Experience	
Co-op/Work Experience	
Other	
Total	90

Course Requisites:

None

Flexible Assessment: Yes

In some cases students may be able to apply for recognition of prior learning outside the classroom. This flexible assessment process provides equivalent course credit. It is a rigorous process that may include external evaluation, worksite assessment, demonstration, standardized test, self-assessment, interview, products/portfolio, and challenge exam, or other measures as appropriate. Tuition fees apply. Contact an education advisor for more information.

Course Transfer Credit:

For information about receiving transfer credit for courses taken at either British Columbia or Alberta institutions, please see <https://www.bctransferguide.ca/> or <https://transferalberta.alberta.ca> . For more transfer credit information, please visit <https://www.cotr.bc.ca/Transfer>

All requests for course transfer credit from institutions in British Columbia or elsewhere should go to the College of the Rockies Enrolment Services office.

Textbook Resources:

Textbook and class teaching materials selection varies by instructor and may change from year to year. Presentations associated with class activities will be posted on COTROnline and should be downloaded and read. The following textbooks have been selected for the class and sections of the textbooks will be utilized in the course. Please consult the instructor syllabus for further details.

Earle, S. 2019. *Physical Geology* – 2nd edition. Online: <https://opentextbc.ca/physicalgeology2ed/>

Waldron, J., and Snyder, M. *Geological Structures: A Practical Introduction*. Online: <https://open.umn.edu/opentextbooks/textbooks/899>

Introductory Physical Geology Laboratory Manual – First Canadian Edition (v.3 – Jan 2020)

Online: <https://openpress.usask.ca/geolmanual/>

Since these textbooks are open access and available online, textbooks do not have to be purchased from the bookstore. The instructor will supplement the class with assignment activities that are not provided in the textbook or the lab manual. These assignment activities will be posted on COTROnline.

In-class activities may include presentations and stories by guests or attendance of online events conducted by virtual meeting technologies.

Learning Outcomes:

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

- reflect upon the Ktunaxa story of creation, contrasting it with other Indigenous science and western scientific worldviews;
- outline respective ways to visit and learn from the homelands and waterways in Ktunaxa ?amak?is, the traditional territory of the Ktunaxa Nation;
- describe theories for the formation of the solar system and the history of the Earth;
- apply the evidence for the plate tectonic theory and how it explains many of the Earth's major processes;
- reiterate the dynamics of the three types of plate boundaries and the geologic processes that occur at each boundary;
- describe the internal mechanisms that drive the plate tectonic process;
- summarize the various deformations of the earth's crust;
- apply the basic principles of structural geology to determine the geologic history of a portion of the Earth's crust;
- explain how igneous, sedimentary and metamorphic rock develops within the rock cycle and describe where these rocks are found within the context of structural geology and processes;
- explain and apply the various relative and absolute dating techniques;
- describe how sedimentary rocks and their fossils reflect the paleo environments at various times in Earth's history;
- recognize common fossils and types of fossilization;
- explain the environmental and geological conditions prevailing during the early stages of Earth's history;
- describe how the arrangement and location of the continents and oceans has changed over time;

- relate the changes in surface features and climate to the organic evolution of the biosphere;
- summarize the conditions that lead up to the mass extinctions that have occurred and the possible catastrophic events that may have contributed to the rate of extinction of some organisms;
- discuss the geologic and chemical processes that result in the formation of ore deposits; and
- demonstrate a basic knowledge of the geology of Canada and British Columbia in the context of world geology and global geological processes.

Course Topics:

- Ktunaxa Creation Story
- Plate Tectonics
- Rocks
- Structural Geology
- The Rock Cycle
- Deformation, Mountain Building, and Continents
- Earthquakes
- The Sea Floor
- Geologic Time
- Fossils and Evolution
- Precambrian Earth and Life History
- Paleozoic Earth and Life History
- Mesozoic Earth and Life History
- Cenozoic Earth and Life History

See instructor's syllabus for the detailed outline of weekly readings, activities and assignments.

Evaluation and Assessments

Assessment Type: On-Campus (face-to-face)

Assessment Type	% of Total Grade
Lab Assignments	30%
Lab exam	10%
Class Project	10%
Midterms	20%
Final Exam	30%
Total	100%

Grade Scheme

A+	A	A-	B+	B	B-	C+	C	C-	D	F
>=90	89-85	84-80	79-76	75-72	71-68	67-64	63-60	59-55	54-50	<50

Pass requirements: A passing average (50% or higher) in both the theory and practical components.

Evaluation Notes: A grade of “D” grants credit, but may not be sufficient as a prerequisite for sequential courses.

Exam Attendance:

Students must attend all scheduled exams at the appointed time and place. Instructors may approve an alternate exam to accommodate an illness or personal crisis. Department heads will consider other written requests. Any student who misses a scheduled exam without prior approval will receive a “0” on the exam.

Academic Policies:

College of the Rockies policies related to courses can be found at <https://cotr.bc.ca/about-us/college-policies/> and include the following:

- Policy 2.4.3 Students with Documented Disabilities
- Policy 2.4.4 Student Conduct (plagiarism, other cheating, behavioral misconduct)
- Policy 2.5.8 Academic Performance
- Policy 2.5.3 Grade Appeal
- Policy 2.4.9 Student Concerns Re Faculty

Course Changes:

The College of the Rockies updates course outlines regularly to meet changing educational, employment and marketing needs. The instructor will notify students in writing of any updates to this outline during the semester. The instructor reserves the right to revise, add or delete material while meeting the learning outcomes of this course outline.