

APPLIED SCIENCE AND MANAGEMENT DIVISION

GEOL 105

Physical Geology

3 Credits

Fall, 2020



COURSE OUTLINE

GEOL 105 PHYSICAL GEOLOGY

3 CREDITS

PREPARED BY: Joel Cubley, Instructor/Coordinator, Earth Sciences

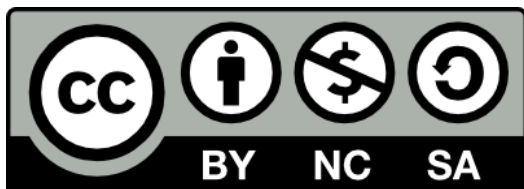
DATE: May 15, 2020

APPROVED BY: Ernie Prokopchuk, Interim Dean, Applied Science and Management

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PHYSICAL GEOLOGY

INSTRUCTOR: Dr. Joel Cubley

OFFICE LOCATION: A2513

E-MAIL: jcubley@yukonu.ca

TELEPHONE: (867) 456-8605

OFFICE HOURS: T/Th (1-3 pm)

CLASSROOM: Online (lecture)

Online or T1090 (lab options, see below)

TIME: T (10:30-12)–lecture (synchronous)

W (1-4) - laboratory

DATES: Sept. 1 – Dec. 15, 2020

COURSE DESCRIPTION

Physical Geology (GEOL 105) is an introduction to the origin, structure, and composition of Earth. The course uses the unifying theory of plate tectonics to frame the presentation of a broad suite of geoscience processes affecting the earth. Topics covered include atomic structure and minerals; igneous, sedimentary and metamorphic rocks; weathering, erosion and depositional processes; earth composition and structure; volcanism, earthquakes, and rock deformation. Hands-on laboratory exercises focus on rock and mineral identification, basic outcrop description, and geologic map reading, construction, and analysis.

Physical Geology (GEOL 105), when paired with Historical Geology (GEOL 106), provide the standard first year of geoscience courses in most B.Sc. degree programs.

PREREQUISITES

There are no prerequisites for this introductory course.

EQUIVALENCY OR TRANSFERABILITY

Physical Geology (GEOL 105) has established equivalency with the following institutions:

Simon Fraser University – EASC 101 (3)

Thompson Rivers University – GEOL 1110 (3)

Trinity Western University – GEOL 109 (3)

University of British Columbia – EOSC 110 (3) and EOSC 111 (1)

University of British Columbia Okanagan – YU GEOL 105 + GEOL 106 = UBCO EESC 111 + EESC 121 (6)

University of Fraser Valley – GEOG 1XX (3)

University of Northern British Columbia – SCIE 1XX (3)

Vancouver Island University – GEOL111 (4)

LEARNING OUTCOMES

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

- identify and classify basic rocks and minerals in hand sample.
- use basic geoscience terminology in describing lithologies, structures and geologic processes.
- connect earth processes to earth cycles, such as the rock cycle and tectonic cycle, and define the time scales at which different cycles operate.
- apply geological and geophysical principles and concepts to solving geologic problems on a number of scales.
- describe the geologic history of a region based on field exposures, maps, cross-sections, rock samples, and photographs.

COURSE FORMAT

This course consists of two 90-minute lectures and one three-hour lab period per week. The lecture schedule included in this course outline details the major topics covered and when those topics will be presented throughout the course. Please note that this schedule will likely be modified throughout the term, as some topics may not be finished within the predicted lecture time.

Lectures for the Fall 2020 offering of this course will be delivered remotely using the Zoom platform. One lecture each week is delivered in a synchronous format (Tuesday from 10:30 am – 12:00 pm), and students are encouraged to join the Zoom session so that they can ask questions in real-time and directly engage with the instructor. The

remainder of the lecture material, which would normally be presented in a second 1.5-hour lecture on Thursday, will be provided to students in Moodle for asynchronous learning. These asynchronous materials will include pre-recorded lectures, videos, and a variety of self-paced learning activities. All instructor presentations, including those delivered during the synchronous lecture period on Tuesdays, will be recorded so that students can also view them on their own time. Student video and/or audio will be captured by the recordings, but the recordings will only be available to students registered in the course. As lecture recordings are intended to replicate face-to-face instruction with engagement between students and the instructor, not all lectures will be available at the start of the semester; this is not an entirely asynchronous online offering.

Students have the option of enrolling either in face-to-face (F2F) or online laboratory sections in the Fall 2020 semester. Face-to-face instruction will be offered at the Ayamdigut (Whitehorse) campus on Wednesday afternoons from 1-4 pm; active social distancing and personal protective measures will be in place. For students in the F2F section, access to the laboratory space and lab materials (e.g. rock sample suites) will be limited to the duration of the scheduled lab section unless arrangements are made with the instructor.

Students enrolled in the online laboratory section of the course will be sent a laboratory kit containing any geological materials needed for lab completion. Students may be required to obtain and use standard home materials (e.g. salt, vinegar) not included in the laboratory kit. Laboratory instructions and worksheets will be provided digitally on the Moodle course page. Online students are strongly encouraged to tune in on Zoom to the laboratory introductions provided to face-to-face students; these introductions will also be recorded for asynchronous viewing. The instructor will be available throughout the F2F laboratory section to directly engage with online learners.

ASSESSMENTS

Attendance & Participation

Students are strongly encouraged to attend all lectures and laboratory exercises in their synchronous (scheduled) time slots, as this results in maximum engagement with the course instructor and fellow students.

Assignments

Weekly lab exercises will be due *at the start of the following lab section*. This allows the instructor to provide ongoing feedback throughout the course and help ensure learner improvement from one assignment to the next. For online students, weekly laboratory assignments will be made available on the morning of the F2F laboratory offering (Wednesday), and the window for submission without penalty will close at midnight on the following Wednesday.

In addition to laboratory exercises, students will participate in three in-class lecture “learning assessments” to help reinforce critical concepts. These are timed group exercises intended to stimulate discussion and collaboration between students. Students must complete these learning assessments during the scheduled lecture time (see course schedule) unless prior arrangements are made with the instructor.

Two take-home lecture assignments will also be administered over the course of the semester. These assignments focus on getting students to engage with and appreciate the geologic landscape in their own area. These assignments will require presentation of findings/observations to course peers using the course forums on Moodle.

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).

Tests

This course has two lecture examinations, a midterm and a final. The midterm exam is conducted during scheduled lecture time; the final exam is conducted during the final exam period scheduled by the Office of the Registrar. The midterm lecture exam is a 1.5-hour exam; the final exam is designed to take 3 hours. Both exams are open-book, timed exams delivered using the Moodle platform. Students may be asked to write exams in a monitored environment.

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. Any student who is absent from a test or exam for legitimate reasons will be eligible to write a deferred exam. Please note that excuses such as car trouble, vacation travel, oversleeping, and misreading the test schedule are not considered legitimate reasons and do not qualify the student for a deferred exam.

For missed exams, the student must contact the instructor within 48 hours of the missed exam by phone or email. For missed final exams, students must contact the Chair of the School of Science. Any deferred exams will be scheduled by the Chair.

Quizzes

Readings from the textbook will be assigned to support lecture instruction. Review quizzes will be administered at the start of lecture classes on a biweekly basis; material in these quizzes can be drawn from both lecture and textbook material. The quizzes are short (5-7 multiple choice questions) and should be viewed as an incentive to stay current with textbook readings.

EVALUATION

<i>Tests and Assignments</i>	<i>Weight</i>	<i>Dates</i>
Weekly Lab Assignments (10)	30% (3% each)	Due at the start of each subsequent lab section.
Midterm Lecture Exam	15%	During lecture class time (see schedule in topic outline).
Final Lecture Exam	25%	During exam period, as scheduled by registrar.
Biweekly Review Quizzes (5)	10% (2% each)	Open-book review quizzes administered through Moodle.
Lecture Assignments & Learning Assessments (5)	20% (4% each)	
Total	100%	

REQUIRED TEXTBOOKS AND MATERIAL

This course utilizes an open-source textbook offered through the BC Campus Open Ed project.

Earle, S. 2019. Physical Geology (2nd ed.). British Columbia (BC) Open Campus.

The textbook may be accessed at: <https://opentextbc.ca/physicalgeology2ed/>

RELATED COURSE REQUIREMENTS

Students who plan to participate from an off-campus location will require a computer with a stable internet connection. A headset with microphone is also recommended.

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 University.

YUKON FIRST NATIONS CORE COMPETENCY

Yukon University 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 University program, you will be required to achieve core competency in knowledge of Yukon First Nations. For details, please see www.yukonu.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 University Academic Regulations (available on the Yukon University 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): lac@yukonu.ca.

TOPIC OUTLINE

Week	Date	Lecture	Lecture Topics(s)	Recommended Resources
1	Sept. 1	1	Course introduction and introduction to plate tectonics	Chapter 1, Chapter 10
	Sept. 3	2	Plate Tectonics: development of the theory	
2	Sept. 8	3	Plate Tectonics: driving forces for plate motion	
	Sept. 10	Learning Assessment #1: Plate Tectonics		
3	Sept. 15	4	Minerals	Chapter 2
	Sept. 17	5	Minerals	
4	Sept. 22	6	Igneous rocks and processes (intrusive)	Chapter 3
	Sept. 24	7	Igneous rocks and processes (extrusive)	Chapter 4
5	Sept. 29	8	Weathering, erosion, and soil formation	Chapter 5
	Oct. 1	9	Sedimentary rocks and processes: rock types	Chapter 6
6	Oct. 6	10	Sedimentary rocks and processes: depositional environments and sedimentary structures	
	Oct. 8	Learning Assessment #2: Rock Cycle		
7	Oct. 13	11	Metamorphic rocks and processes: controls and classification	Chapter 7
	Oct. 15	12	Metamorphic rocks and processes: types of metamorphism	
8	Oct. 20	Midterm exam review		
	Oct. 22	Midterm exam (in class)		
9	Oct. 27	13	Rock deformation and geological structures: stress and strain	Chapter 12
	Oct. 29	14	Rock deformation and geological structures: folding and faulting	

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10	Nov. 3	15	Geologic time: geologic time scale and relative dating techniques (Part I)	Chapter 8
	Nov. 5	16	Geologic time: isotopic dating and other dating methods (Part II)	
11	Nov. 10	Learning Assessment #3: Geologic Time		
	Nov. 12	17	Earthquakes: plate tectonic controls, classification, measurement (Part I)	Chapter 11
12	Nov. 17	18	Earthquakes: plate tectonics controls, classification, measurement (Part II)	
	Nov. 19	19	Introduction to geophysics and the Earth's interior	Chapter 9
13	Nov. 24	20	Geology of the oceans	Chapter 13
	Nov. 26	21	Energy resources	Chapter 20
14	Dec. 1	22	Mineral resources	
	Dec. 3	Final exam review		
15	Dec. 15	Final examination (9 am - 12 pm)		