**Geology 201: Physical Geology I (4 credits), Fall 2019**

Instructor: Deron Carter

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Office hours: M 11:20-12, W 11:30-1:00, T and Th 3:20-4:00, or by appointment

CRN: 23767

Class meeting times: Monday and Wednesday 10-11:20, Friday 10-11:50 in MH 108

**Welcome to Geology!**

In this course we will explore the rocks and minerals that make up the Earth, and how the plates move to create beautiful landscapes and terrible disasters. This class is not about memorizing the names of 100 different rocks and how to distinguish them. Instead, it’s about a way of looking at the world around you and learning how to be confident in your observations and interpretations of that world.

Course Goals:

* To better understand the natural world. The knowledge you build in this course will encourage you to become more curious about how the Earth works.
* To have a general knowledge of science so you can make more informed decisions as a contributing member to society.
* To develop and improve study skills, and other life-long skills such as problem solving, critical thinking, oral communication, and group work. I hope that the skills you learn and refine in this class will carry over into your other classes and your personal life.

**Course Description**

Introduces physical geology and fundamental geologic principles. Topics include Earth's interior, tectonic processes, and their influence on mountains, volcanoes, earthquakes, rocks and minerals. Laboratory component highlights rocks, minerals, and geophysical data. No previous geology or science background is needed to be successful in this course. Geology courses do not need to be taken in sequence. Prerequisite: Math 75. Counts as Physical Science Perspective for AS/OSU degrees and Science with Lab for AAOT degree. Articulates as GEO 201 at OSU.

**Course Learning Outcomes**

**At the end of the course, a student will be able to:**

* Describe the process of scientific inquiry in the context of plate tectonic theory.
* Solve quantitative problems resulting from plate tectonic processes
* Classify and identify important Earth materials
* Use plate tectonic theory to explain geologic processes that occur on and below the surface of Earth

**Learning Resources**

* **Textbook:** Physical Geology, by Steven Earle, BC Open Textbook. The textbook is a free, open-educational resource, available at: <https://opentextbc.ca/geology/>.
* **Geoscience Videos**: by McConnell and Wiggen available at: <https://www.youtube.com/channel/UCtQfVk8PDyHU6e9q_1cEY0Q>
* **G201 Course packet**, by Deron Carter. Please bring to lab days.
* **Moodle.** This is our online class hub: you will check grades, review syllabus and powerpoints, and submit homework assignments. Textbook and video links are also posted here.
* **Calculator.** Any type will do for this class, but only non-graphing calculators (no phones) can be used on exams. I will provide a set for exams.
* **OPTIONAL Hand lens:** The Hastings Triplet 10x, ~$35 on Amazon. Totally optional, but highly recommended for geology majors or rock hounds.

**Grading (subject to change)**

* 3 comprehensive exams = 300 points
* Labs (including field trip or article review and online lab quiz, 10 points each) = 100 points
* Online Video Quizzes = 75 points
* In-class quizzes = 50 points

**Total = 525 points**

**Grading Scale**

A = 100-90% (525-470 points)

B = 89-80% (469-417 points)

C = 79-70% (416-364 points)

D = 69-60% (363-312 points)

F = 59% and below (311 points and below)

**Exams:** The two exams will be administered as a 2-stage “pyramid” tests. You will have a set period of time to take the exam, turn it in, then retake the exam with a group of students in the class (graded 90% for the "solo" effort and 10% for the "group" effort). Your group score cannot lower your grade. If you know you will be absent on an exam day let me know ahead of time to schedule a make up. Once exams are returned they cannot be made up.

**Final Exam**: This exam is comprehensive and will be completed individually; no “pyramid” format.

**Lab exercises and lab quiz:** Labs occur each week and are due at the beginning of the next class. One lab is a field trip to Mary’s Peak (see more below). Late labs are not accepted. Labs cannot be made up, but I drop your lowest score. There will be one online rock and mineral identification lab quiz that cannot be dropped.

**Mary’s Peak Field Trip.** This field trip will take place Saturday, October 12, from 1-5 pm. Limited transportation is available if you cannot drive yourself. The field trip may include a short 1 mile hike up Mary’s Peak. Mary’s Peak requires a $5 parking fee if you drive. We will try to arrange carpooling in class. If you cannot attend the field trip, you may complete a make up assignment. The field trip departs from LBCC at 1 pm in front of the Activities Center.

**Online Video Quizzes:** Before each class on Monday or Wednesday, you will watch a short 5-7 minute Geoscience video and then complete a short quiz in Moodle. These videos will preview what we cover in class. Quizzes are open the week before they are due. You may take the quiz two times, and quizzes always close at 9:00 am. Each quiz is worth 5 points. Late work is not accepted.

**In-class quizzes.** Most weeks we will have a short in-class quiz on Monday, covering previous material in class. These “low stakes” quizzes are designed to help you practice and prepare for the “higher stakes” exams. Your lowest quiz in dropped. If you know you will be absent on a quiz day, please let me know before taking the quiz to schedule a make up.

### Campus Resources

Many resources such as the Library, Student Help Desk (for computers and software) Learning Center, the Writing Desk, and Family Connections, are available to you as a student. They are described on the LBCC website.

Any student who has difficulty affording groceries or food, or who lacks a safe and stable place to live, is urged to contact the **Roadrunner Resource Center (T-112):** [www.linnbenton.edu/rcc](http://www.linnbenton.edu/rcc). Furthermore, please talk with your instructor if you are comfortable doing so. This will enable them to provide any resources that they may have.

LBCC is committed to inclusiveness and equal access to higher education. If you have approved accommodations through the **Center for Accessibility Resources (CFAR)** and would like to use your accommodations in this class, please talk to your instructor as soon as possible to discuss your needs. If you believe you may need accommodation but are not yet registered with CFAR, please visit the CFAR website at www.linnbenton.edu/cfar for steps on how to apply for services or call 541-917-4789.

**Statement of Inclusion**

To promote academic excellence and learning environments that encourage multiple perspectives and the free exchange of ideas, all courses at LBCC will provide students the opportunity to interact with values, opinions, and/or beliefs different than their own in safe, positive and nurturing learning environments. LBCC is committed to producing culturally literate individuals capable of interacting, collaborating and problem-solving in an ever-changing community and diverse workforce. LBCC is an equal opportunity educator and employer.

**Your responsibilities:**

1. **Be prepared** for class by watching the assigned Geoscience Video and taking the quiz.

2. In class, **take notes by hand. Please, no electronics during lecture.** This means you must put away phones, laptops, and tablets. Numerous studies show that students learn more when taking notes by hand (i.e. Mueller and Oppenhiemer, 2014). If you have accommodations or concerns please see me. **If you miss lecture, please get notes from another student**, and do not just rely on lecture slides posted on Moodle.

3. **Actively participate** in class. Long lectures are rare occurrences in this class. Instead, class time will focus on evidence based active learning that requires you to interact with others.

4. **Check the Moodle** website regularly to stay updated with current class information and due dates.

5. **Be on time**, stay for the entire class, listen, and contribute. If you are absent, please let me know.

6. **Honor Code Considerations:** This class is highly collaborative; however, there are expectations for individual work as well. If it is ever unclear to you, please ask. Any cheating, plagiarism, etc., may result in a zero and possible recommendation to the administration for further consequences.

**My responsibility:**

I am here to help you learn. I want each and every student to succeed in this class. Only you can do the learning, but expect me to be available for help during class and office hours and to facilitate the learning process.

***Thanks, Deron***

COURSE SCHEDULE (subject to change):

**Due dates or holidays in bold face**

|  |  |  |  |
| --- | --- | --- | --- |
| Week and Reading | Monday | Wednesday | Friday |
| 1  1.1.-1.3, 9.4 | Introductions | **Sci. Process VQ**  Scientific process | Lab: Intro to Physical Geology |
| 2  1.5, 10.4 through divergent boundaries | **Tect. Plates VQ\***  **In-class Quiz 1**  Tectonic plates and Earth’s interior | **Div. Bound. VQ**  Divergent Boundaries | Lab: Discovering Plate Boundaries  ***Saturday:*** Mary’s Peak Field Trip, 1-5 pm\* |
| 3  10.4, 10.5 | **Conv. Bound. VQ**  **In-class Quiz 2**  Convergent boundaries | **Trans. Bound. VQ**  Transform boundaries, history of NA continent | Lab: Hot spots and Plate Movement |
| 4  Ch. 2 | **EXAM 1** | **Earth’s El. and Sil. Min. VQ**  Earth’s elements and silicate minerals | Lab: Mineral Properties |
| 5  Ch. 3 | **Naming Ig. Rock VQ**  Igneous rocks | Magma formation, crystallization, and plutons | Lab: Igneous Rocks |
| 6  Ch. 6 and 7 | **OVQ 8 due**  **Sed. Rock VQ**  Sedimentary rocks | **Meta Rock and Toast VQ**  Metamorphic rocks and the rock cycle | Lab: Sedimentary and Metamorphic Rocks |
| 7  No reading | **NO CLASS**  **VETERAN’S DAY** | **EXAM 2** | Lab: Earthquake recurrence in Cascadia |
| 8  9.1, Ch. 11, 12.3-12.4 | **Class. Faults VQ**  Faults and earthquakes | **EQ Hzds. VQ**  Seismology and earthquake hazards | Lab: Earthquake Analysis |
| 9  Ch. 4 | **Magma Vis AND Class. Vol. VQ**  **In-class Quiz 5**  Magma viscosity of volcano types | **Vol. Haz. VQ**  Volcanic hazards and monitoring them | **NO CLASS**  **THANKSGIVING** |
| 10  Ch. 8, 12.2 | **OVQ 14 due**  **Unconform. VQ**  Unconformities and relative dating | **Num. Time VQ**  Radioactive decay, numerical dating, age of Earth | Lab: Folds on Geologic Maps |
| Finals week | **EXAM 3**  8:00-9:50 am  MH 108 |  |  |

**\*Video Quizzes are taken on Moodle and due at 9:00 a.m.\***