

Dynamic Earth, GEO 111
Block 1, 2019

Dr. Emily Walsh

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Office hours: By appointment or after class.

Textbook: *An Introduction to Physical Geology* by Tarbuck and Lutgens (11th or 12th edition)

*You will also want to purchase a hand lens (magnifying glass)—available at the College bookstore, ask at the front desk.

Course meeting times: 9:00–11:00 am M–F; 1:00–3:00 pm as scheduled. Two all day fieldtrips (9 am–3 pm): August 30th & September 16th.

Course description: Physical geology is the study of the earth and how it works. *This is a survey course.* We will cover a *wide* range of topics, including: rocks and minerals, plate tectonics, earthquakes and volcanoes, mountain building, rivers and surface processes. The goals of this course are to introduce you to, and make you more aware of, Earth processes and landscapes. You will learn why Earth looks the way it does, and you will learn how we have gained knowledge about our planet. You will be expected to master the vocabulary of geology (which will be new to most of you) and the concepts and mechanisms that drive Earth processes; however, the major goal of this course is to present you with the tools necessary for observing and understanding Earth processes first-hand.

Major learning outcomes:

1. Students will gain an understanding of the fundamental processes of geology. (*Knowledge*)
2. Students will be able to observe the natural world around them, ask questions, and record appropriate geologic observations. (*Inquiry*)
3. Students will be able to make informed suggestions for methods by which to test geological hypotheses. (*Knowledge*)
4. Students will be able to synthesize their own observations and/or other available geologic data to create plausible interpretations for the geologic history of a region or landscape. (*Knowledge, Reasoning, Communication*)
5. Students will be able to use their basic knowledge of geology and their understanding of science as a process to think critically about geoscience reports in the media. (*Knowledge, Reasoning, Communication*)

**This course supports the Educational Priorities and Outcomes of Cornell College with emphases on knowledge, inquiry, reasoning, and communication.*

Course information:

Responsibility:

As students at a liberal arts college, you are responsible for your own engagement in the academic conversation. This means being a prepared, active, and respectful participant. This includes reading the syllabus and all the assigned material, but more importantly, this means thinking critically, asking questions, and engaging in dialogue with others. If you do not

understand a topic of discussion, an assignment, a grade, or if you have any other questions or concerns, please come and talk with me.

Technology Policy

There will be times during class that it would be helpful to use a laptop, tablet, or smart phone. I expect you to use these devices only for class related purposes. If I believe that you are misusing technology, I will issue you a warning—after that I may ask you to leave class and other repercussions may follow.

Late Work:

I will **not** grade assignments handed in after I have handed them back to the class. Until then, late assignments will be docked 25% for each day late and at least 10% for lateness on the due date. Missed quizzes may not be made up without prior approval or evidence of a serious emergency. If you need an extension, please see me **before** the assignment deadline.

Course Accommodations:

Cornell College makes reasonable accommodations for persons with disabilities. Students should notify the Coordinator of Academic Support and Advising (Brooke Paulsen) and their course instructor of any disability related accommodations within the first three days of the term for which the accommodations are required, due to the fast pace of the block format. For more information on the documentation required to establish the need for accommodations and the process of requesting the accommodations, see <http://www.cornellcollege.edu/academic-support-and-advising/disabilities/index.shtml>.

Academic Honesty:

Cornell College expects all members of the Cornell community to act with academic integrity. An important aspect of academic integrity is respecting the work of others. A student is expected to explicitly acknowledge ideas, claims, observations, or data of others, unless generally known. When a piece of work is submitted for credit, a student is asserting that the submission is their work unless there is a citation of a specific source. If there is no appropriate acknowledgement of sources, whether intended or not, this may constitute a violation of the College's requirement for honesty in academic work and may be treated as a case of academic dishonesty. The procedures regarding how the College deals with cases of academic dishonesty appear in The Catalogue, under the heading "Academic Honesty."

Cheating, plagiarism, and other forms of academic dishonesty will not be tolerated. Any student in this course who is involved in academic dishonesty (portraying another person's work or ideas as their own, submitting the same or similar papers in more than one course without permission from the course instructors, facilitating plagiarism, etc.) will not earn credit for the relevant assignments, may be formally charged with academic dishonesty, and may receive an F in the course.

15-Day Drop:

To drop on the 15th day, you may have no more than 2 *excused* absences; you must have completed all your work, and you must have participated in class. I reserve the right to decide which excuses are valid and to determine whether you have been participating actively in class.

Additional Resources Available to You:

To get the most out of this course, I recommend you use all the resources available to you. This includes me, Science Librarian Amy Gullen, Quantitative Reasoning Consultant Jessica Johannigmeier, Writing Consultant Laura Farmer, and Media Consultant Matt Zhorne. The library has a fairly well-rounded assortment of geological books and journals, and what cannot be found there can be found online through the library's electronic resources website. Please ask for assistance!

Graded Work:

You will complete several different types of assignments in this course, including problem sets, reading activities, short write-to-learn essays and free-writes, laboratory reports, fieldtrip write-ups, and a final presentation. Written assignments will generally be turned in on Moodle; assignments turned in on Moodle will receive comments through Moodle.

Grading:

15% Assignments	20% Labs	10% Quizzes
20% Final project	25% Final exam	10% Participation

I use the following general scale but reserve the right to use my discretion and your class attendance/participation record.

A 100–95; A- 94–90; B+ 89–85; B 84–80; B- 79–75; C+ 74–70; C 69–65; C- 64–60; D 59–55; D- 54–50; F <50

*Note that respectful, professional behavior is expected at all times. If I have to ask you to leave the class at any point, you may receive a 0 for participation or for whatever assignment/lab/exam was being performed.

Reading Activities:

Reading a textbook is never easy: each chapter is stuffed with important-looking vocabulary and concepts, graphs and images. It can be difficult to identify which ideas are most relevant to the course. However, textbooks are also *immensely useful* for supporting the information learned in class, framing it in different ways (which might resonate more with your learning style), and providing detailed and instructive images/figures/plots/tables. To encourage you to read the textbook, and to help you distill the information of at least one important topic, you will complete an activity for each chapter. This may include: writing a paragraph reflection to explore a topic from the reading that you found particularly interesting or new; answering questions from the chapter; completing an exercise described in the chapter; or writing a Write-To-Learn essay on some aspect from the chapter. These activities are NOT meant to be a mere summary of the material but rather a way for you to internalize, synthesize and apply this concept to the world around you. Reading activities will be due at 8 am on Moodle. I may grade some of these on a $\sqrt{+}/\sqrt{/}$ system; otherwise they will be counted as credit/no credit. However, doing these activities will be *highly beneficial* to you, as I will draw some of my quiz and exam questions from these activities.

Write-to-Learn Assignments:

These short assignments are meant to help you organize your own thoughts on a subject. By writing these assignments, you will better understand your own knowledge of a topic, as well as

your questions and perspective on that topic. These assignments also help me understand your mastery of a topic. In general, these assignments are due by 8 am the next day on Moodle, and they will not be accepted late. If I grade these assignments, it will be on a $\sqrt{+}/\sqrt{/}\sqrt{-}$ system.

Lab and Field Write-ups:

Labs and fieldtrips are designed to give you hands-on experience to help you learn the course material. Even for group labs, it is very important that you each participate fully to gain a clear understanding of the lab. Fieldtrips and their write-ups will be included in the lab grade. Fieldtrip attendance is mandatory—see me if you are going to miss a fieldtrip.

Final Presentation:

Your final project will be on an aspect of geology that interests you (such as the geological history of an area, a past natural disaster or other geological event, a geological health issue, an environmental issue, or a geological product). You will present your research in a poster session during the last week of the block. You will work on this project throughout the block, finalizing your topics with me, handing in an annotated bibliography, an outline, a synopsis, and a self-reflection. Further instructions will be posted on Moodle.

Quizzes & Exams:

Quizzes and exams will be closed book, closed notes and cumulative. Emphasis will be on testing your understanding of concepts; however, some memorization of terms, definitions and rock and mineral ID will be required. I will give you 5 quizzes throughout the block in place of a midterm. The final exam will cover material from the entire block.

Course schedule:

The following is a tentative course schedule—I may change the order of, add or cull subject material depending on course progress.

Week 1:

Monday, August 26

(due in morning: Ch. 11.3, 12.1–12.3)

9 am — Introduction; Earth structure

1 pm — *Lab 1*: Geologic Timeline (due 8/29)

Assignments — Ch.3+Q; Ch.6 (6.1-6.4)+Q; *Lab 1*

Tuesday, August 27

(due in morning: Ch3Q, Ch6Q)

9 am — Minerals; *Lab 3*: Sedimentary Minerals

1 pm — *Lab 2*: Weathering & Erosion (due 8/28)

Assignments — Ch.7+Q; *Lab 2*; *Lab 1* (due 8/29)

Wednesday, August 28

(due in morning: Ch.7Q, *Lab 2*)

9 am — Sedimentary rocks; Depositional environments

1 pm — *Lab 3*: Sedimentary rocks & paleogeography (due 8/28)

Assignments — Ch.9+Q; *Lab 1* (due 8/29)

Thursday, August 29

(due in morning: Ch.9Q, *Lab 1*, **Topics for final presentation**)

9 am — **Quiz 1**; Geologic time

1 pm — TBA

Assignments — Ch.2+Q (due 9/2)

Friday, August 30

9 am — **Fieldtrip to Wildcat Den State Park** **bring your lunch & water!*

Assignments — Ch.2+Q; *Lab 4* (due 9/3)

Week 2:

Monday, September 2

(due in morning: Ch.2Q)

9 am — *Lab 5*: Seismic Eruption in Cole Library 212 (due 9/2)

1 pm — Plate tectonics

Assignments — Ch.4+Q, *Lab 4* (due 9/3)

Tuesday, September 3

(due in morning: Ch.4Q, *Lab 4*)

9 am — **Quiz 2**; Igneous rocks & processes

1 pm — *Lab 6*: Igneous rocks & minerals (due 9/3)

Assignments — Ch.5+Q

Wednesday, September 4

(due in morning: Ch.5Q, **Annotated bibliography**)

9 am — Volcanoes

1 pm — TBA

Assignments — Ch.8+Q

Thursday, September 5

(due in morning: Ch.8Q)

9 am — **Quiz 3**; Metamorphic rocks

1 pm — *Lab 7*: Metamorphic rocks & minerals (due 9/5)

Assignments — Ch.10+Q

Friday, September 6

9 am — Fieldtrip to Hess Sandpit

1 pm — *Lab 8*: Ivanhoe Gravel Quarry lab (due 9/9)

Assignments — Ch.10+Q; *Lab 8*

Week 3:

Monday, September 9

(due in morning: Ch.10Q, *Lab 8*; **Final project outline**)

9 am — Mountain building; Structural geology
1 pm — *Lab 9*: Structural geology lab (due 9/11)
Assignments — *Lab 9* (due 9/11)

Tuesday, September 10

9 am — **Rock & mineral quiz**; Structural geology
1 pm — *Lab 9*: Structural geology lab (due 9/11)
Assignments — Ch.11+Q; *Lab 9*

Wednesday, September 11

(due in morning: Ch.11Q, *Lab 9*)
9 am — **Quiz 4**; Earthquakes
1 pm — *Lab 10*: Earthquakes (due 9/12)
Assignments — Ch.16+Q; *Lab 10*

Thursday, September 12

(due in morning: Ch.16Q, *Lab 10*)
9 am — Fieldtrip to Palisades–Kepler State Park
1 pm — TBA
Assignments — EPA assignment

Friday, September 13

(due in morning: EPAQ; **Synopsis**)
9 am — **Quiz 5**; Climate
1 pm — TBA
Assignments — Ch.17+Q

Week 4:

Monday, September 16

(due in morning: Ch17Q)
9 am — **Fieldtrip to Maquoketa Caves State Park** **bring your lunch & water!*
Assignments — final posters

Tuesday, September 17

(due in morning: **final posters**)
9 am — **Poster presentations**
1 pm — **Poster presentations**
Assignments — Study for final exam; Reflection

Wednesday, September 18

9 am — **Final exam**
(due at noon: **revised synopsis, final reflection**)