

From Fire to Ice: An Introduction to Geology



Instructor:

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Time and Place:

Lecture: MWF 11:00-11:50, Van Wickle 108
Lab 1: W 1:10-4:00, VW 106 (Dr. Carley)
Lab 2: R 1:10-4:00, VW 106 (Prof. Wilson)
Office Hours: T 11-12 and 1-2; F 3-4:30
Or by appointment or drop-in

Welcome to the world (course objectives): An introduction to geology can (and should!) be a beautiful, powerful, moving experience. It can (and should!) forever change the way you see the world around you. The backdrop of your daily life will be illuminated as you learn about the processes that have built and shaped (and continue to build and shape!) our oceans and continents, and the processes that wear and tear them out of existence. You will begin to recognize and appreciate evidence of the inner-workings of the earth all around you, and in events and decisions that shape the human experience.

Learning outcomes:

- Employ the fundamental elements of the scientific method in the physical and natural world
- Interpret and evaluate representations of scientific data (graphs, tables and maps, etc.)
- Understand how scientific uncertainty informs the evaluation of hypotheses, and cite several relevant examples of uncertainty in modern geologic understanding
- Generate and evaluate evidence necessary to test (or revise!) a hypothesis
- Understand and evaluate the historical development of the theory of plate tectonics, understand its driving mechanisms, and evaluate evidence of tectonic processes
- Conceive of deep time, and demonstrate an appreciation for the time scales on which different earth processes operate
- Understand major events and rates of change throughout geologic history, and describe methodologies used to determine age relationships in the geologic record
- Develop skills necessary to explore and interpret the Earth independently, beyond the walls of Van Wickle Hall

Textbook *Earth: Portrait of a Planet* by Marshak is required for this class. I will use the 5th edition (2015, ISBN: 9780393937503) when I assign readings and make references to the text. If you decide to use an older edition of the book, please check *frequently* with your classmates (or me!) to ensure you are covering the assigned material. Page numbers, figures, and headings have likely changed with each edition of the text. Please note that you will also need to purchase a lab manual and field notebook from the campus bookstore.

Talkin' rocks: I'm here for you! I'm very happy to discuss the course, assignments, your experience, and this dynamic planet of ours. I invite you to stop during office hours, by appointment, or any time you see my door open (note the law of angles). Please keep business hours (Monday-Friday, 8:00 am – 6:00 pm) in mind during our email exchanges.

A typical day / the way I teach: I am a strong proponent of “active learning,” and “challenge-based learning.” In other words, I firmly believe that things “stick” best when you learn by doing. Therefore, I plan to keep traditional lecturing to a minimum. The bulk of our shared class time will be dedicated to hands-on activities, experiments, problem-identifying and problem-solving exercises, peer-instruction opportunities, and discussions (and more!). There will be frequent opportunities to exercise agency and identify subtopics and examples that are particularly interesting and relevant to your own personal interests. Throughout the semester, you will learn a great deal about geology; you will also improve your scientific literacy and critical thinking skills. This approach to teaching and learning has huge benefits, but it requires a great deal of participation, cooperation, and enthusiasm on your part. I thank you in advance.

Attendance: Come to class. Come to lab. Attend fieldtrips. A significant proportion of your grade is dependent upon in-class participation. You must be present to participate. I will happily consider dean-approved absences, or dean-ratified notes from the Baily Health Center. Otherwise, you must be in class (and your assigned lab section) to earn points towards your final grade.

Timeliness: We will spend a lot of class time thinking about and discussing geologic time. In practice, though, I ask that you operate on social contract time. Please be punctual for class, lab, and fieldtrips (*especially* fieldtrips!).

Technology in the classroom: It's not the Stone Age anymore. We live in an amazing technological era, and we will make use of many electronic resources (e.g., Google Earth, GIS, GPS, real-time monitoring data, Excel, Moodle, etc.) during our shared lecture and lab time. However, there is a time and a place for everything. As a general rule, please consider our classroom to be a *screen free zone*. I will be very clear about times when laptops, tablets, and phones (or similar) may be used in the classroom (or field). Otherwise, come to class ready to participate in discussions and activities and critical thinking exercises without the crutch or distraction of a tool with a power button. Failure to cooperate will impact your ability to actively participate, and thus, your grade.

Academic Accommodation: I am available to discuss appropriate accommodations that you may require to be successful in this course. Contact the Academic Resource Hub (<https://hub.lafayette.edu/>) and begin creating an action plan as soon as possible.

Moodle: We will use Moodle frequently, daily reading assignments, resource distribution, discussion forums, surveys and polls, assignment submissions, grade reporting, etc. Please familiarize yourself with Moodle. Let me know if you have any questions or concerns.

Moodle Disclaimer: Moodle contains student information that is protected by the Family Educational Right to Privacy Act (FERPA). Disclosure to unauthorized parties violates federal privacy laws. Courses using Moodle will make student information visible to other students in this class. Please remember that this information is protected by these federal privacy laws and must not be shared with anyone outside the class.

Work Submission:

- Google Earth assignments are due Mondays at 10:00 am via Moodle submission portal
- Lab field notes and self-assessment rubrics are due Mondays at 11:00 am in class
- Non-fieldtrip lab exercises are due at the end of your lab period unless you are explicitly granted an extension by Dr. Carley or Prof. Wilson.
- Extra credit write ups are due one week after seminars at 1:00 pm on Moodle
- Any other assignments (rare) will be collected at the start of lecture on the due date.

Late Work: Late work will be accepted until graded work is returned to your classmates: 5% penalty if late on deadline day, plus an additional 20% penalty after that. Exams cannot be rescheduled.

Work Return: You may pick up graded lab assignments, Google Earth feedback, and participation notecards at the end of your designated lab period. You can view and discuss your graded exams in office hours (typically available one week after you take the exam).

Grade Communication: You are responsible for keeping track of your grades throughout the course of the semester. The value of each assignment is available in the “Grade Breakdown” section of this syllabus. You may inquire about your grade in office hours. Grades are not negotiable—take advantage of extra credit opportunities!

Academic Honesty: Integrity is of paramount importance, and I hold it in the highest regard. It’s okay, encouraged, and often required (!) to struggle with coursework. It’s not okay (never, ever) to compromise your academic integrity. The work you submit for assessments must be of your own creation. The ideas you put forth in discussion and the answers you provide on homework or exams must be your original thoughts; otherwise, credit must be given where credit is due (citing published work, or acknowledging your peers for their intellectual contributions). If you have any questions about academic honesty (particularly for assessments that have a partner or group component), please ask! Any perceived breach of academic integrity will be reported to the chair of the Geology and Environmental Geoscience Department and to the Dean of Students. I urge you to consult the Lafayette College Student Handbook for further information.

Extra Credit: You may earn up to 5% extra credit towards your final grade. The Department of Geology and Environmental Geosciences hosts a fantastic lecture series with guest speakers from around the region/country/world. These lectures are typically held at noon on Fridays in Van Wickle 108, and a tasty lunch is provided for those in attendance. Simply attending the lecture and listening attentively is a great way to learn something new and gain up to 0.25% extra credit towards your final grade. You must sign your name on the attendance sheet to earn this extra credit. A short write up (2 pages, 1 inch margins, 1.5 spacing, size 12 font) can be turned in for a maximum of 1% extra credit towards your final grade. The write up must contain: (1) a summary of the lecture; (2) an overview of issues you found particularly interesting; and (3) questions you have related to the content of the lecture. These will be accepted up to one week following the seminar in question. Dates and general topics are provided below. For more information, visit: <https://geology.lafayette.edu/seminar-series/>

Grading policy:

Exceeds expectations		Good, high-quality work			Sufficient; baseline expectations met			Room for improvement		
A	A-	B+	B	B-	C+	C	C-	D+	D	D-
94%	90%	87%	84%	80%	77%	74%	70%	67%	64%	60%
The provided numbers indicate the minimum score that must be earned for each corresponding letter grade. Grades are non-negotiable. Take advantage of extra credit!										

Grade Breakdown:

Category	Brief Description	%
Participation and Professionalism	Each day you will submit a 3x5 index card with responses to prompts given in class. These notecards will be assessed on effort and engagement. To gain full credit in this category, you will need to attend class and lab, be punctual, meet deadlines, treat others with respect, abide by screen-free rules, and complete additional assignments (rare) designed to help you prepare for in-class activities.	15
Google Earth	You will complete several (almost weekly) Google Earth assignments relevant to current lecture topics and lab activities. Your file will grow each week (e.g., your Week 3 submission will include tasks from Weeks 1 and 2). By the end of the semester, you will have a digital compilation of all major course concepts. Each submission is weighted equally, unless expressly noted on a specific assignment.	25
Labs	Several labs have a fieldtrip component. These labs will be assessed based on punctuality, participation, and your field notebook. Google Earth fieldtrip tasks are calculated in your Google Earth grade, not your lab grade. Because of this, "indoor" labs carry three times the weight as fieldtrip labs in the gradebook.	25
Exam 1	Sketches, labeling, and short answer responses. Material from lecture and lab. All concepts discussed through Wednesday, Oct. 3 (inclusive) are fair game.	10
Exam 2	Sketches, labeling, and short answer responses. Material from lecture, lab, and Google Earth. All concepts discussed through Wednesday, Nov. 14 (inclusive) are fair game. ~30% concepts from Exam 1, ~70% material covered since Exam 1.	10
Final Exam	Short answer, sketches, labeling. Material from lecture, lab, and Google Earth. All concepts discussed this semester are fair game. ~40% major concepts from Exams 1 and 2, ~50% material covered since Exam 2.	15

Course schedule: This schedule, like our dynamic planet, subject to change. Check Moodle frequently for updates. Fieldtrips will only be rescheduled in the event of extreme weather.

Week	Theme	Lab	Important Dates
26 August	Earth Components	Google Earth Tutorial	
02 September	Plate Tectonics	Maps and Field Skills (outside)	
09 September	Boundaries Types,	Local Geology (outside)	
16 September	Volcanoes, and Associated	Minerals	
23 September	Hazards	Igneous Rocks	
30 September	River systems, Floods, and Sedimentary Environments	Bushkill Creek (outside)	04 Oct: Exam 1 (F)
07 October		TBA (weather option)	
14 October		Easton Flood (outside)	Fall Break (MT)
21 October		Sedimentary Rocks and Basins	
28 October	Geologic Laws and Principles, Structural Geology, the Rock Cycle, and Interpreting Landscapes	Structural Geology	
04 November		Metamorphic Rocks	
11 November		Ringed Rocks (outside)	15 Nov: Exam 2 (F)
18 November		Lehigh Gap (outside)	
25 November		No Lab	Thanksgiving (WRF)
02 December	Glaciers and Climate	Geologic Time (outside)	
The Registrar will announce the time, date and place of the final exam at a later date.			