Yosemite National Park, CA

EESC-1000: Earth Systems Science

Spring 2024

COURSE DETAILS

INSTRUCTOR

Dr Siobhan Whadcoat [whadcoat@sas.upenn.edu], Rm. 451, Hayden Hall

Office hours: Tu/W 2 – 3 PM, or by appointment

COURSE MEETING TIMES

Lecture: Mon/Wed, 10:15 – 11:45 AM, Rm. STIT 261

Recitation: once per week (see schedule below)

COURSE DESCRIPTION

The purpose of this course is to introduce you to earth as a complex system by examining earth materials and processes within each of earth's spheres (lithosphere, hydrosphere, atmosphere, and biosphere), in addition to the interaction among these spheres, and the human impacts on the planet and its responses. This class will provide you with a broad background in geoscience and the basic tools needed to understand: the origin of mountains, valleys, and oceans; the processes that shape these landforms; and the hazards that can result from them. By the end of the course, you should be able to:

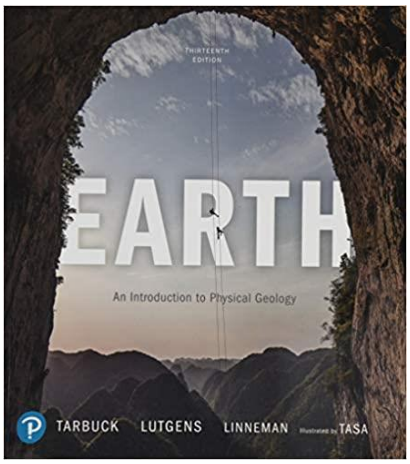
1. Identify Earth's building materials and their origin environments;
2. Recognize and explain the processes that have shaped the Earth's surface;
3. Understand the geologic hazards that can result from Earth's processes;
4. Discuss the feedbacks between human activity and geologic processes.

COLLEGE/LPS CURRICULUM REQUIREMENTS

This course fulfills the Sector VI Physical World and Quantitative Data Analysis requirements for all College and LPS Undergraduates.

COURSE MATERIALS & TECHNOLOGY

This course requires the following textbook, from which readings will be assigned.



Tarbuck, E.J. and Lutgens, F.K. (2020) ***Earth. An Introduction to Physical Geology****, 13th edition. Pearson. ISBN-10: 0135188318*

It is expected that you will complete any assigned readings in advance of the lecture topics to which they are assigned. Please ensure that you have a copy prior to class beginning. The text is available (Penn bookstore, Pearson website) in hard copy and as an e-text to buy or rent. Either format is fine for this class. **Please note that purchasing older editions is fine but bear in mind that the page numbers might be slightly different**.

The following software, freely available from the University, is also required to participate in this course: MS Word, MS Excel, Google Earth.

COURSE COMMUNICATION

Outside of class, most communication will occur via Canvas. Additionally, I (Dr Whadcoat) am available as follows:

- For quick questions that can be answered in writing you may contact me (Dr Whadcoat) via email (whadcoat@sas.upenn.edu) or the Canvas Inbox.
- Office hours will be held every Tuesday & Wednesday (2-3 pm) in 451 Hayden Hall. You do not need to schedule an appointment during that time; just show up.
- Both virtual and in-person appointments outside of office hours can be scheduled via my calendar: https://doodle.com/bp/siobhanwhadcoat/office-hours-by-appointment.

Please note that any questions about examination or assignment grades should be sent via email. Please see the Grading Policies at the end of the Syllabus for specific details regarding potential grading queries.

COURSE FORMAT

Lectures (Mon/Wed, 10:15 – 11:45 AM) form the foundation for your learning in this class, teaching key concepts and generating discussion that builds on the assigned reading each week. In addition, you will attend a recitation once a week, beginning in the third week of the semester (see course schedule). Recitations are designed to be workshops for course assignments: work completed during the recitations will build toward the graded assignments and counts for your participation grade in this course (more details below).

This course consists of a wide range of topics related to earth systems, as outlined in the course schedule below. Each week you will complete assigned readings, attend lectures and your recitation session, and complete a short quiz. In addition, there are four assignments throughout the semester (see course schedule) which will draw together material from the recitation work. These assignments provide an opportunity for you to develop your data literacy skills and deepen your understanding of course material. There will also be two non-cumulative exams throughout the semester.

COURSE PRE-REQUISITES

This is an undergraduate, 1000-level course, and students may be from any program or major. There are no formal pre-requisites for the course, however you will need regular access to the Canvas site and access to a device (phone/tablet/laptop) to participate in in-class polls. In addition, as this course fulfills the QDA requirement, you will be required to recall and use some standard math skills, including solving basic equations and plotting graphs. Recognizing that you may not have taken a math course for some time, there are some materials on Canvas that will refresh your memory and bring you up to speed. You will be expected to work through these materials, and both the TAs and I will be available to help.

ATTENDANCE AND PARTICIPATION

ATTENDANCE

Attending class (both lecture and recitation) is required for your success in this course. Please read the following notes carefully to ensure you understand the policies and grading regarding attendance. These policies will apply equally to all students, with exceptions granted for SDS accommodations.

Lectures

Attendance is not taken at lectures, but information is provided that is not given elsewhere; your attendance is required for your success in this course. If you need to miss a class for illness, family emergencies, or for a religious or secular holiday as recognized by the university then please report via the Course Action Notices. You are responsible for getting notes from a classmate to catch up on the missed work.

Recitations

Recitations provide an opportunity to apply lecture content to help develop your data literacy skills and a deeper understanding of the course material. During recitation you will participate in a variety of activities, which will build towards the graded assignments. You will register for one of the recitation sections and attend the same section each week. Your attendance & participation in recitations counts for your participation grade in this course. To account for extenuating circumstances that may require you to miss a recitation, **you are granted one excused absence, i.e., you may miss one recitation without any impact on your grade**.

Please note that if you are unable to attend your recitation due to extenuating circumstances and/or religious observances then you may contact your TA to request to attend a different section that week. If you are unable to attend any section, then this will count as your excused absence.

COURSE WORKLOAD & EXPECTATIONS

Table 1: Approximate course workload. Some weeks will entail a little more work than others, but in general you should allow ~7 hrs per week for this class (inclusive of lectures and recitations).

Course Component	**Hours**	**Total hours**
Assigned readings[1]	1.5 hrs per week (x13 weeks)	19.5 hrs
Weekly lectures	1.5 hrs x 27 lectures	40.5 hrs
Recitations	1 hr per week (x11 weeks)	11 hrs
Weekly quizzes	30 mins per week (x12 weeks)	6 hrs
Assignments	3 hrs per assignment (x4)	12 hrs
Exams (open-book)	1.5 hrs + 6 hrs prep (x2 exams)	15 hrs
Total		**104 hrs (~7 hrs/week)**

[1] *These will be assigned from the course textbook: Earth (Tarbuck, 2020).*

ASSIGNMENTS

Four assignments will be completed throughout the course (see course schedule). The assignments will draw together material from the work completed in recitations. Most assignments will require approximately 3 hrs work (beyond recitation) to be completed; note that this is an average time, and some assignments will not require this while others may require a little more. Please bear in mind that while the recitation work will often be completed in groups, assignments must be completed individually. I encourage working with one another and sharing ideas, but it is important that everyone completes the work and that individual assignments are submitted.

Due dates for each assignment are listed on the assignment pages and the course calendar on Canvas, and you will be reminded of these dates in class. You are encouraged to respect the deadlines set and plan accordingly. However, to ensure that you can submit work that reflects your best effort and not a last-minute rush, a 24-hr grace period is given where no penalty will be applied to work submitted within 24 hrs of the deadline. For work submitted beyond this time, a grade penalty will apply (10% per day) unless an extension has been provided. If unforeseen circumstances arise, and you are not able to complete the work by the deadline, please reach out to me (Dr Whadcoat) *ahead of the deadline* to discuss an extension.

QUIZZES

Weekly quizzes are low-stakes and designed as a learning exercise. Quizzes are completed on Canvas: you will have three attempts for each quiz and the highest grade will be used. Each week the quiz will be made available after class on Wednesday and will be due before class the following Monday (unless stated otherwise). The answers to each quiz will be released after the due date so that you can use this material for review.

Quizzes must be completed by the due date (late quizzes will not be accepted). There are **no make-ups**. To account for extenuating circumstances that may require you to miss a quiz or may impact your performance, at the end of the semester **the lowest two quiz grades are dropped**.

EXAMS

Two open-book exams (1.5 hours each) will be given during the course. Only paper notes will be allowed in the exam room; no electronic devices will be permitted. The exams are **non-cumulative**, including material from the lectures and assigned readings. The exams will comprise a range of short- and long-answer questions including figure interpretation and synthesis of ideas. Exam 1 will be given during class time according to the schedule below and Exam 2 will be given during the final examination period at the end of the Spring semester. I will notify you of the date as soon as I am provided with the final exam schedule.

Please note that a make-up opportunity for either exam will only be granted for extenuating circumstances, such as illness or a death in the family. Requests must be made ahead of time via email. If you miss Exam 1, the make-up exam will take place the following week; if you miss Exam 2, the make-up exam will take place during the official period for postponed examinations (first week of the Fall 2024 semester) as established by university policy.

GRADING

Final grades are based on a combination of the components outlined above. The breakdown is as follows:

Participation:	15 %
Assignments:	40 %
Weekly Quizzes:	15 %
Exams:	30 %

COURSE SCHEDULE

Table 2: Schedule of course topics, with approximate times of assignments and exams provided.

Week	Week beginning	Topic	Assignments	Recitation
1	Jan 15th	*No Class (semester begins on Jan 18th)*		*No recitation*
2	Jan 22nd	Earth's Geological History		*No recitation*
3	Jan 29th	Plate Tectonics	Assignment 1	1
4	Feb 5th	Plate Boundaries: Mountains & Earthquakes		2
5	Feb 12th	The Rock Cycle & Igneous Rocks		3
6	Feb 19th	Sedimentary Rocks	Assignment 2	4
7	Feb 26th	Metamorphic Rocks		5
8	Mar 4th	*Spring Break: No Class*		*No recitation*
9	Mar 11th	*Exam 1: Mar 13th (Review session on Mar 11th)*		*No recitation*
10	Mar 18th	Introduction to Fluvial Systems		6
11	Mar 25th	Fluvial Environments	Assignment 3	7
12	Apr 1st	Groundwater & Water Resources		8
13	Apr 8th	Mass Wasting		9
14	Apr 15th	Coastal Geomorphology & Shoreline Mgmt		10
15	Apr 22nd	Glacial Geomorphology	Assignment 4	11
16	Apr 29th	Changing Climate: Glacial Cycles		*No recitation*
17	May 6th	*Exam 2: during May 6th – 14th (Review session on May 1st)*		*No recitation*

RECITATION SCHEDULE

Table 3: Recitation section schedule. Recitations begin in week 3 of the semester (see course schedule above).

Section #	Day & Time	Location
201	Monday, 1:45 – 2:45 PM	HAYD 360
202	Tuesday, 1:45 – 2:45 PM	HAYD 358
203	Tuesday, 3:30 – 4:30 PM	HAYD 358
204	Wednesday, 8:30 – 9:30 AM	HAYD 358
205	Wednesday, 1:45 – 2:45 PM	HAYD 358
206	Thursday, 3:30 – 4:30 PM	HAYD 358
208*	Friday, 12:00 – 1:00 PM	HAYD 358

**Note that this section, 208, is reserved for 1st year students only*

POLICIES

DIVERSITY, EQUITY, AND INCLUSION

The Earth and Environmental Science Department embraces human diversity and intends equity and inclusion in our community and our classrooms. We expect all instructors, staff, and students to respect our diversity. We encourage you to contact our Climate, Diversity, Equity and Inclusion (CDEI) Committee at ees-cdeic@groups.sas.upenn.edu if you need support or have suggestions for how our efforts in EES can improve.

ACADEMIC INTEGRITY & GENERATIVE AI

Students are expected to be familiar with and comply with Penn's Code of Academic Integrity, which is available in the Pennbook, or online. This course has a zero-tolerance policy for cheating or plagiarism, and all violations will result in substantial penalties. If you have any doubts or questions about what constitutes academic misconduct, please do not hesitate to contact me.

AI programs, such as ChatGPT, may be used for generating ideas and brainstorming. However, you should be aware that the material(s) generated may be inaccurate and often will completely fabricate information. AI is a tool and should be used as such; it should not replace your own creativity and independent thinking.

You may not submit any work generated by an AI program as your own. If you include any AI-generated material in an assignment, it must be cited like any other reference material. Any plagiarism of this nature will be dealt with severely, as explained in Penn Policies (see above).

CLASS ETIQUETTE

In-person class sessions, including lecture, recitations, and office hours, should be spaces where everyone feels welcome and safe. To facilitate a welcoming and inclusive environment, it is expected that every student in this course will:

- Exercise consideration and respect in their speech and actions.
- Attempt collaboration and consideration, including listening to differing perspectives and respectfully raising any concerns, avoiding direct conflict.
- Refrain from demeaning, discriminatory, or harassing behavior and speech.

Please consider the following expectations when communicating in an online environment, such as on Canvas.

Please do:

- Ask questions and engage in conversations as often as possible.
- Be patient and respectful of others and their ideas they post online.
- Be prepared to wait for a response - you may not receive an immediate response.
- Contact the instructor to report inappropriate or offensive communications.

Please avoid:

- Using inappropriate language—this includes, but is not limited to, the use of hurtful and offensive terms.

- Posting inappropriate materials—this includes, but is not limited to, sharing nude, offensive, and graphic images.
- Posting in ALL CAPS, as this is perceived as shouting.
- Sending or responding to heated messages.
- Sending an email to the entire class, unless it requires a response from all classmates.

ELECTRONICS IN CLASS

To ensure that electronic devices are helpful and not a hindrance to our learning please note the following: You may use your laptop or tablet for taking notes during class and completing in-class activities; however, that privilege will be lost if you are found to be using them for non-course-related reasons (e.g., news, social media, shopping). All other electronic devices should be silenced and hidden (you may use your cell phone as a calculator or to participate in class polls when appropriate). If there is an emergency and your phone must be on/visible, please make either myself or a TA aware of this at the beginning of class.

DISABILITY DISCLOSURE

The University of Pennsylvania provides reasonable accommodations to students with disabilities who have self-identified and been approved by the Office of Student Disabilities Services (SDS). If you have not yet contacted SDS and would like to request accommodations or have questions, you can make an appointment by calling SDS at 215-573-9235 or by visiting their website: https://www.vpul.upenn.edu/lrc/. The office is in the Weingarten Learning Resources Center at Stouffer Commons, 3702 Spruce Street, Suite 300. All services are confidential. I will make every effort to ensure that your needs are accommodated so that you can fully participate in this class. A helpful summary of everyone's roles and responsibilities to ensure your needs are accommodated can be found here.

GRADING

During the grading of assignments and examinations, it is possible that a mistake could be made. There are three categories of mistakes, and you should approach them, and can expect responses, as follows:

1. Errors that introduce confusion or ambiguity in formulating questions: These impose equal disadvantage on all students, and as such, any adjustment will be made solely at my discretion.

2. Errors of addition/subtraction in compiling individual student scores: These are easily corrected and will be done so with due diligence. If you find such an error in an assignment or examination, please bring it to my attention.

3. Errors of judgment in assigning full or partial credit to specific answers: All students are given the benefit of any legitimate doubt in determining the "correctness" of an answer to any question. I am far more likely to award more credit than an answer is worth than I am to award less credit. If you think you have suffered from one or more errors of this category, describe those errors fully, in writing, and submit it with the relevant assignment or exam via email. Your work will be reviewed to see if you should have been awarded more credit for those questions. Please understand that once you submit your work for regrading, the grade can go either up or down.