EPS 10: A Brief History of the Earth

Fall 2025

Mon/Wed 1:30–2:45pm, Room TBD

Teaching Staff

Instructor:
Prof. Rebecca A. Fischer (she/her)
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Office hours by appointment, GeoMuseum 204c

TFs:
Coming soon!

This course provides an introduction to Earth and planetary science for EPS concentrators and an overview, for those outside the field, of the critical events and processes that have shaped the Earth's evolution and its place in the Solar System. The course is designed to highlight the processes, from the scale of microbes to that of tectonic plates, that drive the Earth's response to internal and external perturbations, and we will explore both the timescale of those perturbations and the limits of the Earth's resilience. By considering the full sweep of geologic time, from the Earth's formation to our modern world, the course will take advantage of a series of natural experiments to compare the Earth system during periods with and without atmospheric oxygen, animals, land plants, and polar ice sheets, and to compare it, on occasion, with other terrestrial planets.

Course Plan

Topics to be covered will include:

- Geologic time, relative & absolute dating
- Planetary science, accretion, differentiation, Moon formation
- Origins of atmosphere/oceans
- Minerals, rocks
- Plate tectonics, seismology, mantle convection
- Climate cycles/trends & their causes
- Evolution of the atmosphere, rise of oxygen
- Rise of multicellular organisms
- Mass extinctions
- Snowball Earth
- PETM
- Greenhouse effect
- Modern climate change, sea level

Detailed course schedule coming soon!

Sections

Students must be able to attend one of the three sections (days/times TBD). Sections will meet most weeks, but not every week (detailed schedule coming soon!). Over the course of the semester, we will use the section times for four labs, three "visits" to Harvard facilities, and two optional review sessions.

Labs: The four labs will take place in the Science Center. Lab assignments are due in one week (i.e., by the start of the following week's section).

Visits: We will use additional section time to visit three highly relevant Harvard facilities. Tentative sites:
1. Dataset Visualization Techniques and Technologies (Visualization Laboratory)
2. Historical Representations of the Shape & Structure of the Earth (Harvard Map Collection)
3. Earth Science in Art (Harvard Art Museums)

Review sessions: Two of the sections will be used for optional review sessions to help students prepare for the midterm and final exams.

Field Trip

There will be one field trip as part of this course, a one-day, local, in-person field trip (date TBD). If you are unable to attend the field trip, an alternate assignment will be available.

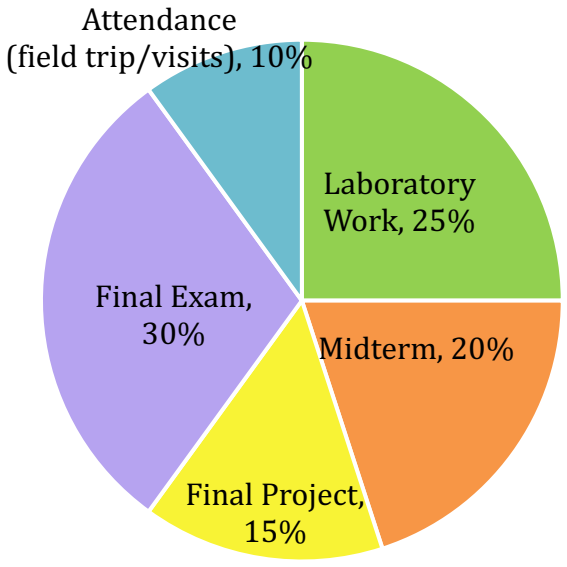
Final Project

The final project is designed to be open-ended and help you further explore a topic in Earth and planetary science that is particularly interesting to you, in whatever format you best express yourself. Final projects are due by the last class meeting. Options include:

1. A ~4–5 page research paper on any topic in Earth and planetary science. It should go beyond what was covered in class, for example by focusing on a topic we did not cover or by diving deeper into some aspect of a topic we did cover.
2. A creative project that expresses some aspect of your connection to Earth and planetary science. Any medium is fine; past examples have included various types of visual art, crafts, musical compositions, poetry, creative writing, etc. A photograph or scan of the piece may be submitted if needed. Please also include a brief caption (~few sentences) explaining the message of the piece and its connection to Earth and planetary science.
3. Or have an idea for a different type of project? Ask Rebecca about it!

Grading Scheme

Laboratory work: 25%
Midterm exam: 20%
Final project: 15%
Final exam: 30%
Attendance during visits and field trip: 10%
(the three visits and the field trip are each worth 2.5%)



All requests for extensions and absences must be approved by Rebecca prior to the relevant deadline. The penalty for late laboratory assignments will be 10% per day.

Academic Integrity

Please read Harvard's policy on academic integrity in the Harvard College Student Handbook (https://handbook.college.harvard.edu) and Harvard's guide to using sources (http://usingsources.fas.harvard.edu/icb/icb.do), including "Avoiding Plagiarism." It is your responsibility to read and understand the Harvard College Honor Code.

Additional note on integrity: Course materials are the property of the instructional staff, Harvard University, or other copyright holders, and are provided for your personal use. You may not distribute them or post them on websites.

Collaboration and academic honesty policy: We encourage collaboration in lab and section activities. However, it is expected that all assignments and lab reports submitted for academic credit will be the student's own work. If you use the work of others in preparing your responses, this must be properly acknowledged as outlined in the Harvard College Student Handbook.

Policy on the Use of AI Technology

Generative A.I. tools (GAI, such as ChatGPT) are widely available, and their capacity to complete tasks is quickly expanding. For written work (e.g., lab assignments and possibly the final project), we permit the use of A.I. tools solely for grammar or sentence-level enhancement, or for the initial stages of a research project. With regard to research, we believe that generative A.I. can be a helpful starting point, especially when used in conjunction with other tools including HOLLIS; however, any work you submit should be your own ideas. With regard to grammar, we a) expect clarity and coherence but do not ourselves teach it as a separate skill in this course and b) do not see a substantive difference between using A.I. this way and availing oneself of the A.I. features that are increasingly a feature of word-processing platforms such as Word and Google docs. Any such use must be appropriately acknowledged and cited. It is each student's responsibility to assess the validity and applicability of any GAI output that is submitted; you bear the final responsibility. Violations of this policy will be considered academic misconduct.

We want to make sure you have access to as much support as possible and that you know what that support is. Here are some of the resources you can (and should!) reach out to:

- The EPS 10 teaching staff! We are always happy to chat with you after class or at any other time by appointment.
- The "Students" page at the Bok Center's Gen Ed Writes site has a long list of campus resources for student writers, including the Writing Center, Harvard Guide to Using Sources, and Departmental Writing Fellows.

Please note that the A.I. policy for this course reflects our specific goals. Different courses will have a wide range of policies based on the goals of those courses, and we hope that you will reach out to us if at any point you are unclear about what our policy is or why. The goal of this policy is not to lessen your access to support for the assignments you will be doing, but rather to allow your experience of the course material and those assignments to be your own. At any point in the semester that you have questions, face challenges, or want to talk through your ideas, please feel free to reach out to the teaching staff anytime.

Diversity, Inclusion, and Belonging

Accommodations for students with disabilities:
Students who need academic adjustments or accommodations because of a disability have a right to have these needs met, so it is a good idea to notify teaching staff as soon as possible. Please present us with your Faculty Letter from the Accessible Education Office (AEO) and speak with us by the end of the second week of the term to ensure we meet your needs. All discussions are confidential, but Faculty may contact the AEO to discuss appropriate implementation (without disclosing personal information).

DIB Statement:
We hope this classroom will be a place where you are treated with respect, and we welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, immigration status, religious affiliations, sexual orientations, ability, and other visible and nonvisible identities. All members of this class are expected to contribute to a respectful, welcoming, and inclusive environment for every other member of the class. We acknowledge in this class that science does not exist in a vacuum – as such, we try to include historical context where appropriate, and source material from scientists that are representative of diversity in the subfields we study.

We also note that each member of the teaching staff is a "responsible employee" – that is, we "have a responsibility to share information that [we] learn about incidents of sexual and gender-based harassment with the Title IX Coordinator." If you are experiencing any kind of harassment, discrimination, or other barriers to your learning and/or social experience at Harvard, please notify one of the teaching staff who can connect you with the right resources (some of which are confidential) to ensure your emotional, physical, and mental safety.