USC University of Southern California

GEOL 105Lg: Planet Earth (4 Units)

Calendar

Term-Day-Time: Summer MTuWTh 10:00 – 12:05 pm.
Location: ZHS 252 (Zumberge Hall).
Instructor: Prof. Sylvain Barbot (sbarbot@usc.edu).
Office Hours: Upon appointment, ZHS 105.
Mid-term I: Thursday, May 23, 10 am – 12:05 pm, ZHS 252.
Mid-term II: Monday, June 3, 10 am – 12:05 pm, ZHS 252.
Mid-term III: Thursday, June 13, 10 am – 12:05 pm, ZHS 252.
Final Exam: Tuesday, June 25, 10 am – 12:05 pm, ZHS 252.

Course Description

Earth is a dynamic system that has emerged from billions of years of evolution. Unique in the solar system, the young face of our planet is preserved by the many feedbacks from processes that have shaped the air we breathe and the landscapes we roam. These processes have operated at time scales that are challenging to grasp, but are now altered and accelerating. Because of the large human population and its environmental footprint, the world's ecosystems are changing faster than ever before. Species are disappearing at alarming rates on land and offshore. Global temperatures are warming, sea levels are rising, and climate is changing. To better appreciate the fragility of our environment, we will discuss our origins. How did our planet form? How did life appear? How did species and their environment co-evolve? What was the climate like throughout Earth's history and how do we know? We will plunge into deep time to better understand our present and positively influence our future. We will examine the Earth as a physical system and describe the pathways of change, the causes and effects, and the current challenges of humanity in the face of a rapidly changing planet.

Learning Objectives

By the end of this course, the students will be able to recall the major events that took place throughout Earth's history. The students will be able to describe the major layers of the Earth and its atmosphere and to identify the major types of rocks. The students will be able to recognize important tectonic regions on Earth and their significance. The students will be able to understand the different factors that affect the climate and how the climate has evolved in all of Earth's history. The students will familiarize themselves with natural hazards, including earthquakes, volcanos, and sea-level rise. The students will familiarize themselves with different types of maps and develop scientific literacy. Overall, the students will learn about the impacts of human activity on the natural world and the consequences on climate, ecosystems, and future sustainability.

Prerequisites:

This is a General Education class and there are no prerequisites.

Communication

Regular communication will be conducted through Blackboard (https://blackboard.usc.edu). In-class participation will be conducted using Blackboard. Ask for appointment with class instructor or teaching assistant via email. All lectures videos and slides will be posted on Blackboard well before the class.

Lectures

From Wednesday May 15th, 2024 to Tuesday, June 25th, 2024, there will be 48 lectures. The lectures are 60 minute-long on Monday, Tuesday, Wednesday, and Thursday from 10:00 am to 10:55 am and from 11:00 am to 12:05 pm in ZHS 252 (Zumberge Hall). All lectures slides will be posted on Blackboard before the class. The lectures include a quiz to help you prepare for the exams. The quiz does not contribute to your grade.

Examinations

There will be three mid-term exams and one final exam. Mid-term I will be on **Thursday, May 23th** from 10 am to 12:05 pm. Mid-term II will be on **Monday, June 3rd** from 10 am to 12:05 pm. Mid-term III will be on **Friday, June 13th** from 10 am to 12:05 pm. The mid-term take place at ZHS 252 instead of the regular the lecture. The Final examination will be on **Tuesday June 25th**, 10 am – 12:05 pm at ZHS 252. The lecture notes include bold words. Make sure that you can define them and use them in context. This will be tested during the mid-terms and the final. We will not provide more study material.

Required Materials

Access to a smartphone or a computer is required in class to answer the PollEverywhere questions in real time.

Assignments

The assignments are to read the relevant notes before the laboratory and to take a quiz between two labs. The lab quizzes and lab attendance count for 25% of the final grade. There is no extra credit.

Grading Breakdown

There will be 3 mid-term exams, overall representing 50% of the final grade. We will have a final exam, which will count for 25% of the final grade. Attendance of the laboratory and quiz will count the remaining 25%. You must pass the lab component to pass the course. For P/NP option, P requires a C or better. There will be no extra credit. The standard for conversion from numerical to letter grade is shown at https://catalogue.usc.edu/content.php?catoid=11&navoid=3437.

Assignment	% of Grade
Mid-term I	10
Mid-term II	15
Mid-term III	20
Laboratory quiz and attendance	25
Final exam	30
Total	100

Academic Accommodations

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me as early in the semester as possible. DSP can be reached at ability@usc.edu and is open 8:30am-5:00pm Monday through Friday. The phone number for DSP is 213-740-0776.

Academic integrity

University policies on academic dishonesty are printed in SCAMPUS. Because cheating negatively affects everyone in the class, we will follow USC guidelines and report all academic misconduct. USC policies on cheating are strict and the minimum punishment is failure in the class and possible expulsion. Please don't make us have to turn you in! And remember that even the appearance of impropriety can be a concern.
More information at https://policy.usc.edu/scampus/.

Attendance

We will accommodate student athletes who cannot attend a lecture, quiz, or mid-term exam with approved Travel Request Letters. We will also accommodate students who give advance notice of religious observation. In each case, we will work with you to find another date to schedule the exam, preferably in the first few days following the original date.

Classroom norms

Student participation during lecture and laboratories and encouraged. Always feel free to ask questions and clarifications. The comments that you make (asking for clarification, sharing critiques, expanding on a point) should reflect that you have paid attention to the instructor comments. Active participation in the laboratories is also strongly encouraged. Do not hesitate to solicitate your teaching assistant should you have any questions with the material.

Lecture outline

- Origin of the Universe
- Threats from outer space
- Formation of the Solar system
- Water worlds
- Planet Earth
- Birth of Earth's crusts
- The rock cycle
- Matter
- Geologic time
- Life
- Origin of life
- Precambrian life
- From trilobites to dinosaurs
- The age of mammals
- Plate tectonics I
- Plate tectonics II
- Seismology
- Earthquakes
- Volcanism
- Seismic hazard
- Physical oceanography
- Atmosphere
- Paleoclimate
- Climate change

- Anthropocene and mass extinctions

Lecture content is subject to change without warning.

Laboratory schedule

Week starting on	Subject
May 15-16	No lab
May 20-23	Planetary geology and Earth's spheres
	Minerals
May 27-30	Igneous rocks
	Sedimentary and metamorphic rocks
June 3-6	Geologic time
	Fossil record
June 10-13	Plate tectonics
	Topography maps
June 17-20	Earthquakes
	LANHM visit (Veteran's Day)
June 24-25	No Lab (Final Exam week)

Classes end on Monday, June 24th, 2024. Final exam is on June 25th, 2024.

Softcopies of lab handouts will be given out each week. **Students must print their own handout before the labs.** Students must read the material before the lab. Each lab will start with a quiz.

You may switch lab schedule if you find a fellow student that wants to switch with you. This is the only way to switch lab. Inform you TA of the switch. We will accommodate your time constraints as much as possible.

Optional textbook

Brian J. Skinner and Barbara W. Murck, *The Blue Planet, An introduction to Earth System Science*, Wiley ed.

Recommended reading

Robert M. Hazen, The Story of Earth, Penguin Books

Yuval Noah Harari, Sapiens, A Brief History of Humankind

Elizabeth Kolbert, The Sixth Extinction: An Unnatural History

David Berkocivi, The Origins of Everything in 100 Pages (More or Less).

Bill Bryson, A Short History of Nearly Everything

David Attenborough, Life

Henry Gee, A Short History of Life on Earth

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, "Behavior Violating University Standards" policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct.

Support Systems:

Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. engemannshc.usc.edu/counseling

National Suicide Prevention Lifeline – 1 (800) 273-8255
Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call
Free and confidential therapy services, workshops, and training for situations related to gender-based harm. engemannshc.usc.edu/rsvp

Sexual Assault Resource Center
For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: sarc.usc.edu

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086
Works with faculty, staff, visitors, applicants, and students around issues of protected class. equity.usc.edu

Bias Assessment Response and Support
Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. studentaffairs.usc.edu/bias-assessment-response-support

The Office of Disability Services and Programs
Provides certification for students with disabilities and helps arrange relevant accommodations. dsp.usc.edu

Student Support and Advocacy – (213) 821-4710
Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. studentaffairs.usc.edu/ssa

Diversity at USC
Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. diversity.usc.edu

USC Emergency Information
Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. emergency.usc.edu

USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.
Provides overall safety to USC community. dps.usc.edu