EARTH SYSTEM EVOLUTION

Meeting Details

- Location: CSRB Seminar Room 2246
- Time: 1:30-2:50pm Tuesdays, Thursdays
- Professor: Adriana Bailey, abaileyr@umich.edu, CSRB 1531C
- Midterm exam: Tuesday, October 8 1:30-2:50pm
- Final exam: Thursday, December 12 4:00-6:00pm

Required Textbook

Lee R. Kump, James F. Kasting, and Robert G. Crane, The Earth System, 3rd Ed. (Pearson/Prentice Hall 2010). ISBN-13 978-0-32-159779-3.

Instructional Support

- Instructional aides:
    - Tori Scheidt, vscheidt@umich.edu
    - Danny Haskell, haskelld@umich.edu
- Student drop-in hours:
    - Mon 2:00-3:00pm, CSRB 2218
    - Tu 3:00-4:00pm, CSRB 2525
    - Wed 2:30-3:30 pm, CSRB 2218
- Ask questions on Piazza 24/7
- Collaborative work encouraged on homework
- One-on-one meetings always welcome by appointment

Course Overview

This is the first core course offered by the Department of Climate & Space (CLaSP) in the College of Engineering. Our focus is on understanding Earth as a complex system, one that gives rise to nonlinear behavior in the face of perturbations and forcing. We will study this nonlinear behavior by investigating variations in Earth's climate over the distant past and by taking a close look at the global changes that are underway today.

Learning Goals

By the end of this class, you should be able to...

- Recognize and describe systems and the characteristics that result in non-linear behavior.
- Relate this knowledge to the Earth System to explain why climate changes can be difficult to predict.
- Evaluate various lines of evidence illustrating climate change today and in the past.
- Explain how today’s climate change is similar to and different from past changes.

Course Expectations

- Keep up with textbook readings
- Participate in class discussions and in-person activities/assignments
- Participate in at least one drop-in hour or meet one-on-one with your instructional team
- Complete weekly homework assignments on Canvas

- Support a respectful learning community

Prerequisites

Students should be conversant with basic chemistry concepts and simple chemical calculations and elementary differential and integral calculus.

Grading

- **Participation** via in-class discussions and activities **10%**
- **Weekly homework** assignments **40%**
    - Participating in a drop-in hour or setting up a meeting with the instructional team counts as one assignment
    - Homework assignments will vary in length and difficulty and the points assigned to each problem will vary accordingly
    - Points (grades) will be assessed based on how you approach the problem, how your explain your method/approach, and correct solutions (when applicable).
- **Mid-term** exam **25%**
- **Final** exam **25%**

Policies

IN-CLASS WORK

Missed in-class work will not be excused but can be turned in on Canvas; however, repeated absences from class will be evaluated as part of the total Participation grade.

HOMEWORK

- Format: All homework will be assigned and submitted through Canvas. Submissions can be text, PDF, or a photo/image of hand-written answers. Please be prepared to provide show all equations used, explain the relevant symbols and constants, and show sample calculations if spreadsheets are used for detailed calculations. Be prepared for open-ended questions!
- Working together on homework problems is encouraged, but every individual should turn in their own assignment, and all assignments will be graded individually. Supporting documentation for homework may be requested by the instructional aides or the professor, so please be sure to save your work. All work in class must follow the UM College of Engineering Honor Code
- Late policy: Assignments are due most Thursdays and always at the beginning of class (1:30 pm) on the specified due dates. Each day the assignment is late, the maximum possible grade will be reduced by **10 absolute percentage points**; however, students may turn in assignments anytime before 1:30 pm on December 5 for half credit.
- One assignment can be missed without penalty. There is no need to provide an excuse or request permission. For students who submit all work, the lowest individual homework assignment grade will be dropped.
- Using GenerativeAI , such as ChatGPT, can enhance our work when used properly but border on plagiarism when used improperly. If you use GenerativeAI on anything you submit for this class, please submit a note with your assignment describing (1) your original prompt to the chatbot and (2) how you reworked and revised the output so that your final document was both factually accurate and reflected your writing voice and style.

EXAMS

The mid-term and final exam are in person and must be taken at the stated time, unless excused with a doctor's note or approval from the student's undergraduate advisor. Computers, textbooks, and "cheat sheets" are not permitted. Relevant equations will be provided to you.

ACCOMODATIONS

Participants with special needs are strongly encouraged to talk to the instructor as soon as possible to gain maximum access to course information. All discussions will remain confidential. University policy is to provide, on a flexible and individualized basis, reasonable accommodations to students who have documented disability conditions (e.g., physical, learning, psychiatric, vision, hearing, or systemic) that may affect their ability to participate in course activities or to meet course requirements. Students with disabilities are encouraged to contact UM Services for Students with Disabilities (https://ssd.umich.edu/) and their instructor to discuss their individual needs for accommodations.