

Geology 1052/2049 – Paleoclimatology

M, W, F 11 to 11:50 am Thaw Hall Room 203

Class Description: The goal of this course is to present an overview of the methods used to reconstruct the earth's climate history and the techniques used to determine the timing of environmental changes. Paleoclimate data from proxy records, such as ice cores or tree rings, provides a longer perspective on climatic variability than is possible from instrumental or historical records. Particular emphasis will be given to the climatic changes during the late Cenozoic – the time of the ice ages. Topics to be discussed will include: paleoclimatic reconstruction, climate and climatic variation, dating methods, ice cores, marine and lake sediments, corals, speleothems, soils, pollen, dendrochronology, packrat middens, documentary data, and paleoclimate models.

Prerequisite: GEOL 0800, GEOL 0860, or equivalent.

Instructor: Dr. Mark Abbott, Geology and Environmental Science

Office: SRCC Room 200 or 315; **Phone:** 412-624-1408; **email:** mabbott1@pitt.edu

Office Hours: Mon and Wed 12:00 to 12:50 and by appointment. I will do my best to have an open door policy. Please feel free to come see me with questions!

Attendance: Required. Class participation is important and is counted toward your grade. Please let me know if you are going to miss classes by email. Attendance is part of your class participation grade.

Required Text: Earth's Climate Past and Future, William F. Ruddiman, W.H. Freeman and Company New York.

Examinations: The exams will cover material presented in the lectures and reading assignments. The final exam will be cumulative.

Undergraduate Grade Summary:

Class Participation and Attendance	5%
Exam 1	25%
Exam 2	25%
Final Exam (cumulative)	45%

Graduate Grade Summary:

Class Participation and Attendance	5%
Exam 1	15%
Exam 2	15%
Final Exam (cumulative with take home portion)	35%
Research paper and class presentation – see me	30%

Policy on Late Work and Makeup Exams: There are no make-up exams or work unless there are absolutely unavoidable circumstances and a written excuse is provided. Make-up exams consist of essay questions.

Web Site: The course web site is located at:

<http://www.pitt.edu/~mabbott1/climate/mark/Teaching/teaching.html>. The site contains the syllabus, announcements, and assignments for the class. I may revise the class schedule as the term progresses, so please check there for the most current class information.

Cell Phones: Use of cell phones (this includes talking, texting, or using the internet) is not allowed in class. Before class starts, turn your phone off or put the ringer on silent and keep it out of sight.

Disability Resources: If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the Office of Disability Resources and Services, 216 William Pitt Union, 412-648-7890/412-383-7355 (TTY), as early as possible in the term. Disability Resources and Services will verify your disability and determine reasonable accommodations for this course.

Academic Integrity: Academic Integrity Policy on cheating/plagiarism must be in the syllabus. [Academic Integrity Policy: Cheating/plagiarism will not be tolerated. Students suspected of violating the University of Pittsburgh Policy on Academic Integrity, noted below, will be required to participate in the outlined procedural process as initiated by the instructor. A minimum sanction of a zero score for the quiz, exam or paper will be imposed.]

E-mail Communication Policy: Each student is issued a University e-mail address (username@pitt.edu) upon admittance. This e-mail address may be used by the University for official communication with students. Students are expected to read e-mail sent to this account on a regular basis. Failure to read and react to University communications in a timely manner does not absolve the student from knowing and complying with the content of the communications. The University provides an e-mail forwarding service that allows students to read their e-mail via other service providers (e.g., Hotmail, AOL, Yahoo). Students that choose to forward their e-mail from their pitt.edu address to another address do so at their own risk. If e-mail is lost as a result of forwarding, it does not absolve the student from responding to official communications sent to their University e-mail address. To forward e-mail sent to your University account, go to <http://accounts.pitt.edu>, log into your account, click on **Edit Forwarding Addresses**, and follow the instructions on the page. Be sure to log out of your account when you have finished. (For the full E-mail Communication Policy, go to www.bc.pitt.edu/policies/policy/09/09-10-01.html).

Course Organization: The lecture schedule is subject to change.

Day	Date	Lecture Topic	Reading Assignment
W	Jan 4	Overview of Climate Science	Chp 1
F	Jan 6	Earths Climate System Today	Chp 2
M	Jan 9	Climate Archives, Data, and Models	Chp 3
W	Jan 11		
F	Jan 13	CO2 and Long-Term Climate	Chp 4
M	Jan 16	University Closed for Martin Luther King's Birthday	
W	Jan 18	Plate Tectonics and Long-Term Climate	Chp 5
F	Jan 20		
M	Jan 23	Greenhouse Climate	Chp 6
W	Jan 25		
F	Jan 27	Exam 1	Covers Chp 1-6
M	Jan 30	From Greenhouse to Icehouse: The Last 50 Million Years	Chp 7
W	Feb 1		
F	Feb 3	Astronomical Control of Solar Radiation	Chp 8
M	Feb 6		
W	Feb 8		
F	Feb 10	Graduate Student Presentations (will be on exam)	
M	Feb 13	Graduate Student Presentations (will be on exam)	
W	Feb 15	Insolation Control of Monsoons	Chp 9
F	Feb 17		
M	Feb 20	Insolation Control of Ice Sheets	Chp 10
W	Feb 22		
F	Feb 24	Orbital-Scale Changes in Carbon Dioxide and Methane	Chp 11
M	Feb 27		
W	Mar 1	Orbital-Scale Interactions, Feedbacks, and Unsolved Mysteries	Chp 12
F	Mar 3		
M	Mar 6	Spring Break	
W	Mar 8	Spring Break	
F	Mar 10	Spring Break	
M	Mar 13	Exam 2	Covers Chp 7-12
W	Mar 15	The Last Glacial Maximum	Chp 13
F	Mar 17		
M	Mar 20	Climate During and Since the Last Deglaciation	Chp 14
W	Mar 22		
F	Mar 24	Millennial Oscillations of Climate	Chp 15
M	Mar 27		
W	Mar 29	Humans and Preindustrial Climate	Chp 16

F	Mar 31		
M	Apr 3	Climate Changes During the Last 1,000 Years	Chp 17
W	Apr 5		
F	Apr 7	Climatic Changes Since 1850	Chp 18
M	Apr 10		
W	Apr 12	Causes of Warming over the Last 125 Years	Chp 19
F	Apr 14		
M	Apr 17		
W	Apr 19		
F	Apr 21	Final Exam	Covers Chp 13-19