

GEO 302C – Climate: Past, Present, Future (Spring 2014)

Location: CLA 0.130

Time: MWF 9:00-10:00

Professor: Tim Shanahan

Office: Schoch 3.126 (Shanahan)

Office hours: Monday 3:30-5:00 (Shanahan)

E-mail: tshanahan@jsg.utexas.edu

Phone: 232-7051 (Shanahan)

Textbooks

Earth's Climate: Past and Future (2nd edition) W.F. Ruddiman, W.H. Freeman and Company, ©2008 ISBN-13: 978-0-7167-8490-6 ISBN-10: 0-7167-8490-4

BlackBoard Use

PowerPoint lectures and lab handouts are available on BlackBoard. It is expected that you have a computer with internet access or that you have access to these facilities.

Overview:

This is an introductory-level course intended for non-science majors. Lecture times are MWF 9-10am, room 0.130 in the Liberal Arts Building, plus one 1.5-hour discussion section in room 2.308 Geology Building.

Course content:

Climate history of the Earth and the reasons behind Earth's climate change, including the physical concepts and climate processes that control heat and mass transfers in the atmosphere; the role of oceans; scales of climate change including tectonic-scale, orbital-scale, glacial and millennial-scale, historical and future climate change; global warming; human effects on climate; health impacts of climate change; ecosystem impacts

Class policies and requirements

- Attendance is required, both in lecture and discussion section
- **No laptops or other portable electronic devices**; Please turn off your phone before coming to class. Why do we have this policy? Mainly because of the complaints of past students but see also this [editorial](#)
- If you need to come late or leave early, contact your instructor prior to class;

Course Credit:

This course may be used to fulfill three hours of the natural science and technology (Part I or Part II) component of the common core curriculum and addresses the following four core objectives established by the Texas Higher Education Coordinating Board: communication skills, critical thinking skills, teamwork, and empirical and quantitative skills.

Policy on Grades:

Course Grading

Exams: 15% x 3 = 45%

Final Exam: 15%

Labs: 25%

Reflection essays: 15%

Final Grades: Your final letter grade will be based on your total score from exams and labs. Grades are assigned using a standard curve that reflects the accomplishment of the class as a whole. The percentage-letter grade relationship will usually be: **>90 A, 80-89 B, 70-79 C, 60-69 D, and < 60 F**. Your attendance will affect your final grades.

Exam (55%): three midterms and one final exam will be given. All three midterm exams and the final exam must be taken. There are no make-up exams given. If you miss an exam and do not present a valid documented excuse within 24 hours, your grade for that exam will be zero. If you miss a lecture exam and present a valid excuse within 24 hours, then the lowest grade of your other two exams will substitute for the missing score. Only one missed exam can be substituted for in this manner. If there are special extenuating circumstances presented within 24 hours, alternatives to this policy will be considered.

YOU MUST BRING YOUR UT ID CARDS TO ALL EXAMS. ALL NECESSARY MATERIALS EXCEPT PENCILS AND ERASERS WILL BE PROVIDED.

Lab Assignments (25%): Lab assignments must be turned in on time, at the beginning of your assigned lab section. Lab assignments turned in late will receive 0 credit. Your cumulative score from lab assignments will be counted as 25% of your final grade.

Reflection essays (15%): Due biweekly in lab. Late essays will not be accepted for credit. See document on journal essay assignments for details.

Attendance: Your success in this course depends on your class and lab attendance. Excessive absences **will** work against you, while perfect attendance can help you to the next highest letter grade in borderline situations at the end of the semester. We typically find that students who rely only on class notes, without attendance, perform poorly on exams and in the class in general.

Statute of Limitations: If you wish to appeal a grade received on an exam, or lab, your appeal must be made within 7 days from the time it is handed back. No appeals will be considered after that deadline.

The University Honor Code: “The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the University is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.”

Students are expected to read and to strictly adhere to the University’s written policies on academic dishonesty. Cheating or plagiarism will result in a zero for the semester. See the University’s policy on academic integrity at the [Student Judicial Services](#) website, and read an [editorial](#) on this subject.

How to do well in this class

The exams will be based on the lecture material and the discussion section activities are designed to support your learning of the lecture materials. If you wish to do well in this class, the most important things you can do are 1) come to class, 2) pay attention in class (pretend that there will be a quiz at the end of class on the lecture you just heard), 3) take good notes, 4) do the reading assignments before coming to class to familiarize yourself with the subject matter, and review your notes and the readings on a daily to weekly basis rather than a few days before the exam, 5) use the time set aside at the beginning of discussion sections and at office hours to review material that you are having difficulty with (on a weekly basis rather than a few days before the exam), and 6) make use of the services below as needed. Most educational studies recommend between 2 and 3 hours of study time for each hour of lecture.

How to Engage in this Class

1. Attendance

2. Interaction During:
 - a. Class
 - b. Office Hours
 - c. Supplemental Lectures/labs

Services for Students

[Student Judicial Services](#)

[Services for Students with Disabilities](#)

[Undergraduate Writing Center](#)

[UT Learning Center](#)

A note to students with disabilities: students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities, 471-6259.

WEEK	Journa	Lecture	Text readings	Lab
1		Intro weather vs climate climate variability + feedback mechanisms	Chapter 1 Chapter 1	intro-1
2		no class energy balance 1 energy balance 2	Supp. Chap 2 Supp. Chap 2	no lab this week
3	1	atmosphere 1 atmosphere 2 hydrological cycle	Supp. Chap 2 Supp. Chap 2	2- Daisyworld/energy budget
4		circulation of the atmosphere circulation of the oceans circulation of the oceans 2	Supp. Chap 2 Supp. Chap 2 Supp. Chap 2	3- the atmosphere

5	2	air sea interactions	Supp. Chap 2	5-CO2
		review for exam1 Exam 1		
6		cryosphere biogeochemical cycles Carbon cycle		6-ocean circulation
7	3	Paleoclimate proxies		7- dendroclimatology
		Stable isotopes	Ch 1	
		Taking the earth's temperature.	Ch 2	
8		Tree rings		8-Seafloor sediment records
		Early Earth and long- term climate TBD	Ch3	
9				
10	4	Snowball Earth	Ch3 54-57	9-lake sediment cores
		Plate tectonics and climate change	Ch 4	
		Greenhouse climate	Ch 5-6	
11		Orbital scale variability review exam 2 EXAM2	Ch 7	10-proxy calibration
12	5	Insolation control of the monsoons	Ch 8-9	11- paleoclimate record
		Orbital changes in the atmosphere	Ch 10	
		The last glacial maximum	C12	
13		Abrupt climate change	Ch 13	12- CO2 changes
		millennial scale changes	Ch 14	
		Humans and cliamte change	Ch 15	
14	6	The LIA and the MCW	Ch 16	13-global temperature changes

		The last century	Ch 17	
		Anthropogenic greenhouse gases	TBD	
15		Greenhouse debate the IPCC projections whats up with the weather? Video assignment	TBD TBD TBD	makeup week
16	7	Texas Climate? EXAM3 LAST CLASS Review FINAL	TBD	14-presentations