GEO 302C – Climate: Past, Present, Future (Spring 2012)

Location: JGB 2.216
Time: MWF 9:00-10:00

Professor: Tim Shanahan
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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 2.216 in Geology 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

Course Credit:

Policy on Grades:

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 curve mean represents a 'C'. However, if the mean score of each test is close to 75, 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 (75%): three midterms and one final exam will be given. All three midterm exams and the final exam must be taken. Your best two midterm scores **plus** the final exam score will be counted as 75% of your final grade - i.e., you may drop you one lowest midterm score, but not the final exam score. The Exam Schedule is on

the web. Exams are given only once. There are **NO** make-up exams, **NO** extra-credit in lectures and labs, and **NO** specially scheduled exams. Exceptions may be made for handicapped students, but they must request any special arrangements early in the semester. All exams are cumulative in their coverage. They will cover material from lectures and reading assignments. You will be asked questions about general concepts as well as specific points of information.

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.

ATTENDANCE:
Your success in this course depends on your class and lab attendance. **"Be aware** of the fact that attendance will be taken and this information will be used in the computation of your final class grade. 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."

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.

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.

Class		day	Topic	Text reading
	1	18-Jan W	01-Introduction	NA
	2	20-Jan F	02-Weather and climate	Ch. 1, p. 1-16
	3	23-Jan M	03-Climate System/variability	
	4	25-Jan W	04-Atmosphere composition	
	5	27-Jan F	05-Energy Balance	
	6	30-Jan M	06-Heat Transport	Ch 1, p. 5
	7	1-Feb W	07-Atmospheric Circulation	
	8	3-Feb F	08-Hydrological Cycle	
	9	6-Feb M	09-Ocean circulation I	
	10	8-Feb W	10-Ocean circulation II	
	11	10-Feb F	11-Air Sea Interactions	Ch 16 p. 299-302; Ch 17 p. 321-324
	12	13-Feb M	12-Cryosphere	Ch 2 p. 21; C10 p. 176-177
	1	15-Feb W	13-Biosphere	Ch 3 p. 46-47; p. 53-58
	2	17-Feb F	Carbon Cycle	same as above
	3	20-Feb M	exam review	
	4	22-Feb W	exam	Ch 2 p. 17-31
	5	24-Feb F	15-Isotopes	Appendix I: p. 360-361; Ch. 6.2, p. 100-101
	6	27-Feb M	16-Radiocarbon dating	
	7	29-Feb W	17-High resolution records	
	8	2-Mar F	18-Tectonics and climate	Ch. 4, 64-67, 71-80, Ch. 5, p. 81-86;
	9	5-Mar M	19-Orbital climate	Part III, p. 116-117; Chapter 7 (p. 119-136) and Chapter 8 (137-153)
	10	7-Mar W	20-Ice Sheets	Chapter 9 (p. 163-174, Ch. 12 (p 210-228)
	11	9-Mar F	21-Ice cores	Chapter 10 (p. 175-190); Appendix II: p363-364
No class		11-Mar M	spring break	
No class		14-Mar W	spring break	
No class		16-Mar F	spring break	
	1	18-Mar M	22-Pleistocene ice ages	Chapter 11 (p. 191-205)
	2	21-Mar W	23-Last Glacial Maximum	Part IV, p. 205-206; Chapter 12 (p. 209-224)
	3	23-Mar F	23-Last Glacial Maximum cont	
	4	26-Mar M	24-Deglaciation	

5	28-Mar	W	25-Millennial variability	
6	30-Mar	F	exam 2 review	Ch. 13 (p229-249)
7	2-Apr	M	exam	Chapter 14 (p. 251-261)
8	4-Apr	W	26 - Historical climate change	Part V, p. 270-271; Chapter 16 (p. 287-308)
9	6-Apr	F	27 - Volcanoes and sunspots	Chapter 16 (p. 303-306)
10	8-Apr	M	28 - Instrumental climate	Chapter 17 (p. 309-324)
11	11-Apr	W	29 - Culture_climate	
12	13-Apr	F	30 - Climate and health	
13	15-Apr	M	31 - Greenhouse gases	Chapter 18 (p. 325-335)
14	18-Apr	W	32 - Greenhouse debate	Chapter 18 (p. 325-335)
15	20-Apr	F	33 - Mitigating future climate change	Chapter 18 (p. 325-335)
16	22-Apr	M	exam 3	last class
17	25-Apr	W	Review for final	
18	27-Apr	F		
19	29-Apr	M		
20	2-May	W		
21	4-May	F		
22	6-May			