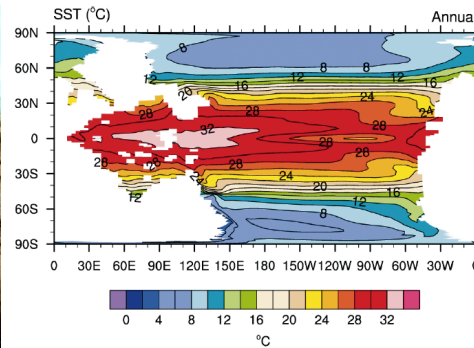


GEOL4325/5308 Paleoclimate & Climate Change



Right: Permian Land & Life. Left: Permian climate simulation from the National Center of Atmospheric Research

Instructor: Prof. Arne Winguth (Email: awinguth@uta.edu; Ph: 817 272 2977)

Time: MWF 11:00-11:50 GS Rm 104

Text:

1. T.J. Crowley and North (1991). "Paleoclimatology". Oxford Univ. Press.
2. W.F Ruddiman (2008). "Earth Climate Past and Future". Freeman Press, 2nd edition.

Course description:

Climate change throughout geologic time, especially the last 100 Million years: Models of the climate system, reconstruction and modeling of past climates, abrupt climate change, warm climates, paleoclimatology, climate change and mass extinctions. Prereq: Jr st or one year calculus-based college physics, oceanography, or meteorology or cons instr.

Course Content:

1. Introduction: The climate system, climate processes and its time scales, mechanisms and evidence of climate change
2. Introduction to climate modeling: Energy balance models and three-dimensional climate models, feedbacks in the climate system
3. The present climate and its seasonal to decadal variability
4. Climates of the past 1000 years
5. Quaternary Climates: Glacial-Interglacial cycles (the last 2,000,000 years)
6. Tertiary Climates: Global Warming at the late Paleocene (2-65 Million years BP)
7. Mesozoic Climates: Late Cretaceous climates and extinction, Jurassic climates (Opening of the Atlantic)
8. Paleozoic Climates: Permian-Triassic mass extinction and climate change, ice house and hot house climates
9. Early History: Snowball Earth
10. Past Climates & Future Climate Change

SYLLABUS GEOL 4325/5308 Paleoclimate and Climate Change Fall 2009

INSTRUCTOR: PROF. WINGUTH

Version August 18, 2009

Week	Days	Topics	Reading Chapter Crowley & North
1	Aug. 24, 26, 28	Introduction to the climate system	1
2	Sept. 2, 4	Models of the climate system	1 & IPCC Ch 8
3	Sept. 7, 9, 11	Present climate	2 IPCC Ch 8
4	Sept. 14, 16, 18	Past 1000 years "Hockey Stick"	5 IPCC Ch. 6
5	Sept. 21, 23, 25	Quaternary Climates Reconstruction of the last 20,000 yrs	3 & 7 IPCC Ch. 6
1. EXAM	Sept. 28	Material Week 1-5	
6	Sept. 30, 22 Oct. 2	Modeling the climate of the last 20,000 yrs	4
7	Oct. 5, 7, 9	Tertiary Climates Global Warming at the Paleocene	10
8	Oct. 12, 14, 16	Cretaceous Climates Asteroid Impacts	8-9
9	Oct. 19, 21, 23	Early & Middle Mesozoic Climates	8-11
Draft Paper Due	Oct. 23	Deadline of Term Paper Draft	
10	Oct. 26, 28, 30	Paleozoic Climates Permian-Triassic mass extinction	11
2. EXAM	Nov. 2	Material Week 6-10	
11	Nov. 4, 6	Early History Snowball Earth	12
12	Nov. 9, 11, 13	Future Climate Change	13 & 14
13	Nov. 16, 18, 20	Guest Lectures	TBA
14	Nov. 23, 25	Term Paper Preparation	TBA
Final Paper Due	Nov. 30	Final Due Date Term Paper	
15	Nov. 30 Dec. 2, 4	Review Week	
Exhibits	TBA	Term Paper Posters	
FINAL	Dec. 9	11:00-13:30 FINAL EXAM	

Grading Guidelines GEO4325/5308

Fall 2009

1. Term paper: 25% of total grading. Graduate students have to give an oral presentation of the term paper (20 minutes including discussion).
Draft paper due for all students: October 23
Final paper due date: November 30

The term paper has to be written in own words in a scientific style.
Identical copy of a term paper from web or other sources (plagiarized papers) will result in an F
2. 2 Midterm Exam (February 18, March 31, 9:00-9:50, 15% each of total grading).
3. Final Exam (Wednesday, December 9, 2009, 11:00-13:30), 30% of total grading.
4. 3 Lecture Quizzes (practice test) (5% each; 15% total)
5. Lecture & Exam will be in GS 104 11:00-11:50

Examinations

Exams will consist of multiple choice, short answer, and short essay questions. Content of the exams will include material from the textbook and the lectures. The final examination covers the material of the entire course, particularly the material covered since the last midterm. Several synthesis questions, incorporating material since the beginning of the class will also be included in the final. Students with conflicting exam schedules are requested to inform the instructors at least a week prior to the exam and, if possible, accommodations will be arranged. Students informing the instructors of conflicts after the exam will be accommodated only in the case of documented emergencies.

Required Readings

Readings listed on the syllabus should be completed before the lecture. The lectures will be designed with the assumption that you have a basic understanding of the assigned material.

Students with disabilities are strongly urged to inform the instructors, as early as possible, of any needed accommodations.