ATM S 211: Fall Quarter 2001
Climate and Climate Change

http://www.atmos.washington.edu/2001Q4/211

Syllabus

Class Meeting Times and Location: Daily (M-F) from 10:30 to 11:20 am in Room 310C in the Atmospheric Sciences Building

Instructor:Lyatt Jaeglé
e-mail: **jaegle@atmos.washington.edu**
Phone: (206) 685-2679
Office: Room 306 in the Atmospheric Sciences Building
Office hours: Wednesdays after class (11:30-12:30), or by appointment

Teaching Assistant: Amy Canavan
e-mail: canavana@atmos.washington.edu
Phone: (206) 543-9144
Office: Room 329 in the Atmospheric Sciences Building
Office hours: Tuesday after class (11:30-12:30) and Friday 2-3 pm or by appointment

Course Description

This is an introductory course for non science majors on climate and climate change. The class will be divided in three parts:

- **Climate of the present.** We will examine the nature of the global climate system and the main processes controlling climate. Topics covered will include the global energy balance, atmospheric circulation, the role of oceans in climate, the carbon cycle, atmospheric composition.
- **The role of climate in Earth and human history.** In this part of the class we will discuss how climate changed in the past on timescales ranging from billions of years to thousands of years.
- **Global change:** Is the Earth getting warmer? Why? How will climate change over the next 100 years? Should we be concerned? How are we changing the stratospheric ozone layer? These are some of the current major environmental concerns which we will discuss in class.

Prerequisites

None. Open to all undergraduates.

Grading policy

Your grade will be based on exams (two midterms and one final exam), assignments, a research project, and class participation:

Assignments 25%
Research project 25%
Midterms 20%
Final exam 20%
Quizzes, class participation 10%

You are expected to attend lectures and participate in class. There will be no make-up exams except in the case of serious illness or death in the immediate family, in which case you must contact the instructor in advance of the exam. **Assignments** are due in class at 10:30 am on the day indicated. ***Late assignments will not be accepted without advance arrangement.*** Assignment 5 will be a written critique of an article in the non-scientific media about some aspect of climate change. You will have the opportunity to present your critique orally as a basis for class discussion if you wish. For the **research projects**, students will research the details of Earth's past climate over specific time periods.

The points assigned to the various exams and assignments are as follows:

homework assignments (5)	250 points (5 x 50)
midterms (2)	200 points (2 x 100)
final	200
research project	250
Class participation and quizzes	100
total	1000 points

Points on the above scale are converted to grade points as follows:

1000	4.0
980	3.9
960	3.8
900	3.5
800	3.0
700	2.5
600	2.0

Based on this grading scheme, the mean GPA for ATMS 211 last quarter was 3.1.

Textbook

"The Earth System" by Lee R. Kump, James F. Kasting, and Robert C. Crane, Prentice Hall, 1999.
The lectures will largely follow the textbook. Each week the students will be required to read material of direct relevance to the class, but the curious student would do well to read the entire book. In addition, after each class, lecture notes will posted on the web. These notes will summarize the main topics covered and provide additional material not included in the book (such as web links).

Class schedule

(the details of the schedule may change as the quarter progresses – please always check the class web site for the latest schedule! **http://www.atmos.washington.edu/2001Q4/211/schedule.html**)

Date	Lecture topic	Required reading	Assignt. due
	WEEK 1	Chapter 1; Chapter 2 (p.19-25; 30-32)	
M 10/1	Introduction and course overview		
Tu 10/2	Synopsis of Chapter 1: Global change		
W 10/3	Introduction to systems and feedbacks		
Th 10/4	Daisyworld		
Fri 10/5	*Review Session*		
	WEEK 2	Chapter 3	
M 10/8	Radiation		
Tu 10/9	Planetary energy balance		
W 10/10	The greenhouse effect		**#1**
Th 10/11	Vertical mixing in the atmosphere		
Fr 10/12	*Review session*		
	WEEK 3	Chapter 4	
M 10/15	How moisture affects convection		
Tu 10/16	Poleward transport of heat by atmospheric motions		
W 10/17	Global patterns of temperature and rainfall		**#2**
Th 10/18	Climate zones; Factors that influence temperature and vegetation		
Fr 10/19	*Review session for midterm #1*		
	WEEK 4	Chapters 5-6	
M 10/22	**Midterm #1**		
Tu 10/23	The hydrosphere; Structure of the oceans		
W 10/24	The marine biosphere; Wind driven ocean circulation		
Th 10/25	The thermohaline circulation		
Fr 10/26	The cryosphere		
	WEEK 5	Chapters 7-8	
M 10/29	Plate tectonics		
Tu 10/30	The carbon cycle		
W 10/31	The carbon cycle (cont.)		
Th 11/1	Overview of history of Earth		
Fr 11/2	*Review session*		
	WEEK 6	Chapters 9-11	
M 11/5	How unique is the Earth?		project due
Tu 11/6	Evolution of the atmosphere; rise of oxygen		

W 11/7	The past 100 million years		
Th 11/8	The past 1 million years		
Fr 11/9	*Past climates and ice-cores*	*Guest lecture by Melanie Fitzpatrick*	
	WEEK 7	Chapter 12	
M 11/12	**VETERANS DAY - NO CLASS**		**# 3**
Tu 11/13	"The big chill" BBC documentary		
W 11/14	Milankovitch cycles		
Th 11/15	The past 20,000 years		
Fr 11/16	The past 2,000 years; Impact of climate on human history		
	WEEK 8	Chapter 13	
M 11/19	Review session for midterm #2		
Tu 11/20	**Midterm # 2**		
W 11/21	*El Niño and the Southern Oscillation (ENSO)*	*Guest lecture*	
Th 11/22	**THANKSGIVING - NO CLASS**		
Fr 11/23	**THANKSGIVING - NO CLASS**		
	WEEK 9	Chapter 13; Chapter 14	
M 11/26	Acid Rain; Ozone hole I		
Tu 11/27	Ozone hole II		
W 11/28	Human impact on the carbon cycle		**# 4**
Th 11/29	*Evidence for global warming*	*Guest Lecture by Richard Gammon*	
Fr 11/30	*Review session*		
	WEEK 10		
M 12/3	Physics of greenhouse warming		
Tu 12/4	*Impacts of greenhouse warming*	*Guest Lecture by Philip Mote*	
W 12/5	Greenhouse warming policy issues		
Th 12/6	Student discussion of greenhouse warming opinion pieces		**# 5**
Fr 12/7	Global warming discussion		
	WEEK 11		
M 12/10	NOVA Video Part I		
Tu 12/11	NOVA Video Part II		
W 12/12	*Review session for Final*		
F 12/14	**FINAL EXAM** 8:30-10:20 am		