AT621, Fall 2006

Atmospheric Chemistry

Tuesdays and Thursdays, 10-10:50 AM, 212B ACRC

Instructor: Prof. Jeff Collett
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http://www.atmos.colostate.edu/chemistry/classes.html

Objectives:

- To provide students with a familiarity of concepts essential to an understanding of sources of atmospheric trace gases and particles, their chemical and physical transformations, their atmospheric effects, and their removal processes.
- To provide an overview of current topics in atmospheric chemistry research.

Office Hours: Times and locations of office hours will be determined the first week of class.

Text:

John H. Seinfeld and Spyros N. Pandis, *Atmospheric Chemistry and Physics: from Air Pollution to Climate Change*, 2nd Ed. John Wiley and Sons, 2006.

Lecture notes will be distributed for the class.

Course Structure and Grading Criteria:

Periodic homework is assigned and is due at the start of the class indicated. No late homework assignments will be accepted without prior approval by the instructor. Homework will be graded and returned.

There will be two exams. Exams are designed to test basic concepts and problem solving ability and are closed book and closed notes.

Each student is to prepare and deliver an oral presentation on a topic of their choice, related to the material discussed in this course. This project will require independent research and must include an appropriate literature survey.

Grades are weighted as follows:

Homework: 25% Exam 1: 25% Exam 2: 25% Project: 25%

Project:

Each student is encouraged to develop his/her own project topic idea. A list of possible ideas will be provided, but should not be considered as limiting. Topics must deal with some aspect of atmospheric chemistry. Project proposals are due in October and will be reviewed by the instructor to ensure project criteria are met. Students will make oral presentations of their project near the end of the semester. Further guidelines and grading criteria will be distributed early in the course.

Date			TOPIC/Lecture Notes Reading Assignment	Other Reading (from Seinfeld and Pandis text unless noted)
August	22	T	Intro/Course Outline/Review of Chemistry Concepts	
	24	R	Review of Chemistry Concepts	pp. 77-84
	29	T	Structure of the Atmosphere/Transport Processes	1-19, 980-996
	31	R	Lifetimes/Biogeochemical Cycles	900-914, 932-938
September	5	T	Modeling of Biogeochemical Cycles	21-27
	7	R	Some Important Chemical Cycles	38-47, 52-55
	12	T	Some Important Chemical Cycles	27-38, 47-52
	14	R	Principles of Photochemistry	98-135
	19	T	Principles of Photochemistry	204-219
	21	R	Stratospheric chemistry	138-169
	26	T	Stratospheric chemistry	169-195
	28	R	*No class – to be made up in double presentation session at semester end*	
October	3	T	Chemistry of the Background Troposphere	219-235
	5	R	Chemistry of the Background Troposphere	242-259
	10	T	Chemistry of the Background Troposphere	261-265
	12	R	Combustion Sources of Pollutants / Urban Air Chemistry and Smog	235-241
	17	T	Combustion Sources of Pollutants / Urban Air Chemistry and Smog	Finlayson-Pitts article
	19	R	Review	
	24	T	**EXAM 1**	
	26	R	Introduction to aerosols	
	31	T	Particle size distributions	
November	2	R	Visibility	
	7	T	Introduction to atmospheric aqueous phase chemistry	
	9	R	Aqueous phase chemical equilibria	
	14	T	Aqueous phase chemical kinetics	
	16	R	Multiphase chemistry: the role of clouds Acid Rain	
	21	T	*No Class - Thanksgiving Holiday*	
	23	R	*No Class - Thanksgiving Holiday*	
	28	T	Review	
	30	R	**EXAM 2**	
December	5	T	Special topic lecture (or Presentations)	
	7	R	Presentations (double session to be scheduled)	