

Syllabus

Atmospheric Chemistry - Chemistry 641

Evans Lab, Room 2003
TuTh 12:00-1:18 PM
Course# 25954; Winter 2010

Description: Chemistry and composition of the lower atmosphere (troposphere and stratosphere), including regional and global perspectives. Course is designed for graduate students, and undergraduate students with junior status. This course is an approved core course for the Ohio State Environmental Science Graduate Program degree.

Instructor: Heather C. Allen, Professor of Chemistry, Newman and Wolfrom Bldg., Rm. 3105
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Teaching Assistant: Chris Beekman, ESGP PhD candidate, Newman and Wolfrom Bldg.
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- Text: Chemistry of the Upper and Lower Atmosphere, B. J. Finlayson-Pitts, J. N. Pitts, Jr., Academic Press, 2001
- Current scientific literature will be incorporated into the lectures (references to be given prior to class discussions)

Week 1: Atmospheric Chemistry Overview – physical properties and structure of the troposphere and the stratosphere, temperature profile, concentration profiles

Week 2: Atmospheric Chemistry of the Stratosphere – stratospheric ozone cycle, depletion, NO_x, halogen cycles, polar stratospheric cloud chemistry

Week 3: Chemistry of Global Climate Change – Historical account of greenhouse gas and aerosol concentrations, carbon dioxide, ozone and altitude, aerosol uncertainties, sulfur cycle

Week 4: Atmospheric Chemistry of the Troposphere – tropospheric chemical cycles, hydroxyl and chlorine radical, chemical cleansing, oxidation, hydrocarbons in the troposphere, sources and sinks

Week 5: Urban Smog - VOC/NO_x – Historical account of air pollution, progress and problems in experiments and modeling, assessing human impact on the atmosphere

Week 6: Special Topics; Guest speaker William Keene, University of Virginia

Week 7: Case Studies: West vs. East, California vs. Ohio

Week 8: Case Studies: World Events and Global Pollution, U.S., Mexico, Africa, and China

Week 9: Case Studies: Northern Hemisphere Pollution and the resulting Chemistry and Production of Haze in the Arctic

Week 10: Frontier Areas in Atmospheric Chemistry – research areas that have recently made an impact on the understanding of atmospheric chemistry

Course Grading

Homework	20%
Midterm exam	20%
Class participation in discussions	10%
*Presentation + paper	25%
- topic approved by 1/31/10	
- scheduled weeks 7 thru 10	
Final exam	25%

*Students will give a short presentation on an approved publication relevant to current topics in atmospheric chemistry. These presentations will be scheduled in the last several weeks of the scheduled classes. Students will also be required to turn in a 3-page paper focused on the research area of their presentation.

Disability Services: If you feel you may need an accommodation based on the impact of a disability, please contact me privately to discuss your specific needs. Also, please contact the Office for Disability Services at 614-292-3307 in room 150 Pomerene Hall to coordinate reasonable accommodations.