

Department of Atmospheric Sciences

COURSE ANNOUNCEMENT – SEMESTER II – 2006–2007

ATMS 420: Atmospheric Chemistry
(Same as CEE 447 and ENVST 450)

Call number: 31725

Instructor: Prof. Donald Wuebbles, 106 Atmos. Sci. Bldg., 244-1568

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Room and Time: 109 Atmospheric Science Bldg., 9:00-10:15 a.m. Tu Th

Credit: 3 hours

Prerequisites: CHEM 104, CEE 330 or ATMS 401, or consent of instructor

Atmospheric chemistry processes affect us all in many ways. Concerns about human and ecosystem health related to oxidant formation and particulate matter and other issues in air quality, concerns about changes in stratospheric ozone and its effects on ultraviolet radiation, concerns about greenhouse gases and climate change, and concerns about sulfur and mercury emissions affecting water ecosystems all depend heavily on understanding atmospheric chemistry. This course will introduce the most important atmospheric chemistry processes, their significance and their interactions on scales from local to regional to global.

Course Content:

1. **Introduction to the Atmosphere.** Origin of the atmosphere; Atmospheric structure and physical properties; Chemical composition of the atmosphere; Atmospheric dynamics.
2. **Fundamental Principles Governing the Chemistry in the Atmosphere.** Solar radiation and its absorption; Atmospheric mass transport; Photochemistry; Chemical kinetics; Equilibrium.
3. **Global Atmospheric Chemistry.** Importance of ozone, hydroxyl and other constituents.
4. **Air Pollution Chemistry.** Atmospheric trace gases; Gas-phase Atmospheric Chemistry; Aqueous-phase atmospheric chemistry; Mass transfer; Aerosols; Acid rain.
5. **The Chemistry of Aerosols/Particles**
6. **The Role of Atmospheric Chemistry in the Environment, Including Concerns About Climate Change.**

Text: *Introduction to Atmospheric Chemistry*, Daniel J. Jacob, Princeton University Press, 1999.