

CEE 662
Atmospheric Chemistry and Monitoring

- Catalog data:** 20-CEE-662. Atmospheric Chemistry and Monitoring. 3 ug./gr.cr. A review of organic chemistry as it applies to environmental engineering. Atmospheric chemistry: photochemical smog formation and atmospheric aqueous chemistry. Monitoring of relevant air pollutants.
- Prerequisites:** None or permission of the instructor.
- Textbook:** John H. Seinfeld and Spyros N. Pandis, *Atmospheric Chemistry and Physics: From Air Pollution to Climate Change*, ISBN: 0-471-17816-0, John Wiley & Sons, 1997.
- References:** Selected journal publications
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- Goals:** The fundamentals of atmospheric chemistry through known air pollution problems, such as the regional ozone problem, the stratosphere ozone depletion, acid deposition and the global warming and cooling effects. The monitoring of important atmospheric species.
- Lecture or lab topics:**
1. Introduction
 2. Organic chemistry overview
 3. Atmospheric photochemical reactions in the troposphere
 - The chemical Kinetics
 - The basic ozone formation reactions (PSSA)
 - The nonmethane organic compounds (ROO radicals)
 - The biogenic hydrocarbons
 - The photochemistry of other species
 4. Chemistry of the stratosphere (CFCs)
 5. Aqueous-phase atmospheric chemistry (SO_x, NO_x)
 6. Atmospheric chemistry and the climate change (carbon balance)
 7. Introduction to MOPAC
 8. class presentation
- Computer usage:** Spreadsheets, MOPAC, a molecular orbital chemical package will be used, together with RasMol and Babel to view the chemical structures, in PC or Unix environment.
- ABET criterion 3:** a, b ,e, g, h, j, k
- ABET criterion 8:** a, b, c, d, f
- Date prepared:** December 12, 2002 , Last Update April 25, 2007