

EAS 4740: Atmospheric Chemistry

Professor: Paul H. Wine

Text: Introduction to Atmospheric Chemistry, by D.J. Jacob, Princeton University Press, 1999, ISBN 0-691-00185-5.

Prerequisites:

CHEM 1310

PHYS 2211

MATH 2401

EAS 3603 or CHEM 3411 or PHYS 3141 or ME 3322 or CHE 3110

Description:

This course provides a general chemical description of the Earth atmospheric system with a major focus on the two lowest layers of the atmosphere, i.e., the troposphere and the stratosphere. The interactive coupling between sources, sinks, chemical transformations, and transport processes in controlling the distributions and temporal variability of atmospheric trace gases and aerosols will be stressed. Major environmental issues such as stratospheric ozone depletion, greenhouse warming, acid precipitation, and urban air pollution will be discussed.

Syllabus:

Introductory Chemical and Physical Description of the Atmosphere

The Use of Simple Models in Atmospheric Chemistry

Atmospheric Transport

Biogeochemical Cycles

Atmospheric Radiation, Aerosols, and the Greenhouse Effect

Chemical Kinetics and Photochemistry Applied to the Atmosphere

Stratospheric Ozone

The Oxidizing Power of the Troposphere

Ozone Air Pollution

Acid Precipitation