EAS/CEE 6795 Atmospheric Aerosols

Fall 2011

Mon Wed Fri – 11:05 to 11:55
Instructor: Rodney Weber

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Course Objective: Introductory course aimed at understanding the fundamental concepts of aerosol **physics** with applications to atmospheric aerosols.

Text Book: Hinds, Aerosol Technology: Properties, behavior and measurement of airborne particles, 2nd Edition
Reference Books: Seinfeld and Pandis, Atmospheric Chemistry and Physics
Friedlander, Smoke, Dust, and Haze.

Syllabus

Introduction

Topic 1: Describing Aerosol Populations
- Size Distributions and Moments (N, A, V…)
- Discrete/Continuous
- Lognormal Distributions
- Particle Statistics
- Atmospheric Aerosols, size distributions/modes

Topic 2: Dynamics of Single Particles
- Continuum vs Non-Continuum Dynamics
- Drag - Stokes Law, Slip correction
- Gravitational Settling
- Motion In External Fields (Electrical)/Aerosol Charging, Charge Distribution (DMA)
- Brownian Motion and Particle Diffusion (sampling losses)
- Phoretic Effects
- Aerosols and Fluid Motion (filtration, impaction, sampling inlets, inhalation)
- Non-Spherical Particles

Topic 3: Processes
- Homogeneous Nucleation
- Growth: Condensation/Evaporation (CPCs)
- Coagulation

Grades: 33% midterm, 33% Final Exam, 34% Homework,