

CEE 671 Aerosol Science and Engineering

- Catalog data:** 20-CEE-671. Aerosol Science and Engineering. 3 ug./gr. cr. Fundamentals of aerosols: size distribution, physical and chemical properties; mechanics motion, agglomeration, diffusion and settling; formation and growth of atmospheric aerosols; visibility; current research topics.
- Prerequisites:** None or permission of the instructor.
- Textbook:**
1. William C. Hinds, *Aerosol Technology: Properties, Behavior, and Measurement of Airborne Particles*, 2nd Edition, ISBN:0-471-19410-7, John Wiley & Sons
 2. 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
- References:**
1. Paul A. Baron, and Klaus Willeke, *Aerosol Measurement: Principles, Techniques, and Applications*, 2nd Edition, ISBN: 0-471-35636-0, John Wiley & Sons
 2. Sheldon K. Friedlander, *Smoke, Dust, and Haze : Fundamentals of Aerosol Dynamics*, ISBN: 0-19-512999-7, Oxford Univ. Press
 3. Selected journal publications
- Coordinator:** Dr. Mingming Lu; Rhodes Hall 797; Phone: 513-556-0996
Email: mingming.lu@uc.edu
- Goals:** To introduce the fundamentals of aerosol science and engineering in the following aspects: physical and chemical characterization of aerosols; mechanistic characteristics of particles; optical properties, aerosol formation and growth; current research topics.
- Lecture or lab topics:**
1. Introduction: definition, sources and environmental impacts
 2. Aerosol size distributions
 3. Single particle dynamics
 - a. Stokes' law
 - b. Gravitational settling
 - c. Impaction
 - d. Brownian motion
 - e. Phoretics
 4. Midterm exam (in class)
 5. Aerosol sampling, indoor air quality & bio-aerosols (brief intro.)
 6. Organic Aerosols
 7. Aerosol formation and growth
 8. Optical properties of aerosols
 9. Student term project presentations
- Computer usage:** Spreadsheets
- ABET criterion 3:** a, e, g, j, k
- ABET criterion 8:** a, b, c, d, f
- Date prepared:** December 12, 2002, Last Update April 25, 2007