

MECH 577, Aerosol Physics and Technology

Course Objectives, Grading, and Policies

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Spring 2021

Monday, Wednesday 4:00 p.m. to 5:15 p.m.

Online on Microsoft Teams (link TBD)

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Office Hours:

By appointment only. If you have questions of any kind regarding the course or its contents, please raise them in class or send me an e-mail.

Overview and Objectives:

The objective of the course is to discuss aerosols and their relationship to applications in science and engineering, air pollution control, atmospheric science, and public health. The course requires knowledge of calculus and college-level physics. Topics cover the physical and chemical principles underlying the behavior of particles suspended in air, including: particle size, aerodynamics, motion of particles in a force field, particle size statistics, optical and electrical properties, diffusion, condensation and evaporation, deposition in the respiratory system, bioaerosols, and measurement techniques. Upon completing this course, students will be able to (1) describe particle properties that are relevant for aerosol behavior and measurement, (2) describe the fundamental forces that govern aerosol transport, (3) employ state-of-the-art techniques for aerosol measurement, (4) identify significant gaps in our understanding of aerosol behavior, and (5) communicate their knowledge of aerosol measurement techniques in a concise written format.

Student Effort

The expected level of student effort for this course is 6-9 hours outside of class per week.

Textbook (required):

Hinds, William C., Aerosol Technology, 2nd edition, Wiley, New York, 1999.

Grading:

Grades for the course will be decided as follows:

1 st Exam:	20%
2 nd Exam:	20%
Final Exam (take-home)	40%
Project:	20%

Weekly Quizzes:

Short, pop quizzes will be given approximately once per week at the beginning of class and will cover the reading material assigned from the text for the ongoing chapter. Each quiz will be worth ~1 percentage point of extra credit towards the next exam. A strong showing on the quizzes can advance each test score by 1 to 2 grade levels. Therefore, it is in your interest to complete the assigned reading before each lecture and come to class prepared.

Homework:

You should also work homework problems. The course syllabus indicates the relevant problems from the back of each chapter in the book. Additional problems/questions may be distributed to you from time to time. You can work on these problems by yourself, together with your classmates, or with students who took the course in previous years. If you have difficulty with any of these problems, please feel free to come discuss them with us. Historically, the amount you learn in this course will relate directly to your ability to work problems from the text and from the website. If you do the homework problems and understand them, you will be well prepared for the exams. Students who work too few homework problems often do poorly in the course. Homework will not be graded.

Exams:

There will be two midterm exams in this course. They will each be 75 minutes long and will be open book, timed exams, to be taken on Canvas. The final exam may take the form of a take-home or in-class exam, which will be decided later in the class. The date for the final exam is in accordance with the CSU exam schedule for classes that meet MW at 4:00 p.m. Exams from years past will also be made available on the course website. I strongly suggest that you use these past exams as study material; I write new problems for each exam, but my imagination is limited.

Project:

There will be a self-designed project in this course. Details will be shared during the first week of class.

Academic Policies:

All students are expected to be familiar with Colorado State University's statement of Student Rights (<http://catalog.colostate.edu/general-catalog/policies/students-rights/>) and Responsibilities (<http://catalog.colostate.edu/general-catalog/policies/students-responsibilities/>), especially in regard to matters of academic integrity. Violations of academic integrity, at the instructor's discretion, will result in grading penalties and a failing grade in the course. Some examples of serious offenses are possession and use of the instructor's manual and receiving or giving help on an exam, quiz, or project. Students may help each other to understand general principles involved in learning concepts needed for an individual assignment, but utilizing even parts of another student's work will be considered a violation of academic integrity on the part of both students.