ATMO/CHEE 469B/569B: Air Pollution II: Aerosols
Harvill Bldg (Room 305); T/Th 08:00–09:15 (Spring 2019)
Syllabus
(*The information contained in this syllabus is subject to change)*

Description of Course
This course will introduce you to the chemistry and physics of aerosol particles.

Course Prerequisites
Sufficient math to know how to handle a first order linear ODE

Instructor and Contact Information
Prof. Armin Sorooshian (armin@email.arizona.edu); Harshbarger 108E; 520-626-5858
Office hours: Open Door Policy

Course Format and Teaching Methods
Lecture format with discussion and occasional activities

Course Objectives and Expected Learning Outcomes
Students are expected to become knowledgeable about the following: aerosol sources and sinks; basic aerosol properties; single aerosol mechanics; aerosol population dynamics; atmospheric aerosol optics; aerosols and climate; aerosols and health; regional haze; aerosol measurement techniques; current events and public policy relevant to aerosol particles

Absence and Class Participation Policy
The UA's policy concerning Class Attendance, Participation, and Administrative Drops is available at: http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop

The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable, http://policy.arizona.edu/human-resources/religious-accommodation-policy

Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See: https://deanofstudents.arizona.edu/absences

Participating in course and attending lectures and other course events are vital to the learning process. As such, attendance is highly encouraged at all section meetings. It is appreciated if students who miss class notify the instructor in advance.

Course Communications
Course Website: D2L

Required Textbook

Aerosol Technology: Properties, Behavior, and Measurement of Airborne Particles, by William C. Hinds, 2nd Edition, Wiley, New York (1999).
Note: you can get by without buying the textbook as a pdf copy is posted to D2L; for open note/book exams you can print out relevant pages if you prefer

Assignments and Examinations: Schedule/Due Dates

There will be approximately seven homework assignments, one midterm exam, a project (required for 569B students, optional for 469B students), and a final exam.

Homework: Homework is due at the beginning of class on the scheduled due date. To receive credit, all work must be original and that of the student and not from any other source such as solution manuals that often have typographical errors. Late homework will not be graded. All work that is not picked up beyond 1 week after the first day a return is attempted will be recycled to ensure students are responsible and up-to-date.

Exams: Exams are open book/notes, and 75 minutes long (final exam is two hours).

Make-up exams: A make-up exam may be arranged if you notify the instructor at least one week before the regularly-scheduled exam. A makeup exam will be scheduled only if the student has a valid reason for missing the regularly scheduled exam.

Final Examination

The date and time of the final exam (also shown in previous table), along with links to the Final Exam Regulations can be found here: http://www.registrar.arizona.edu/schedules/finals.htm

Grading Scale and Policies

The class will be graded on a straight scale (A = 100-90; B = 89-80; C = 79-70; D = 69-60; E: < 60) based on the assignments and weighting shown in this table. Note that there will be several opportunities to improve your grade based on both extra credit opportunities and class participation.

Category	Undergraduate	Graduate
Homework	34%	20%
Midterm Exam	30%	23%
Final Exam	36%	32%
Project	Optional to replace lowest exam score	25%

NOTE: A one letter grade drop will be applied for the first violation of the Code of Academic Integrity (including using a solution manual or other service to assist you with homework) in addition to receiving a zero for that assignment.

Requests for incompletes (I) and withdrawal (W) must be made in accordance with University policies which are available at http://catalog.arizona.edu/policy/grades-and-grading-system#incomplete and http://catalog.arizona.edu/policy/grades-and-grading-system#Withdrawal, respectively.

Dispute of Grade Policy: Students have seven days from the day a grade is posted on D2L to dispute a grade on any graded item during the semester.

Scheduled Topics/Activities

Weekday	Day of Month	Month	Topic	Reading
Th	10	Jan	Course introduction; Why are aerosols important?; Climate Change	Hinds 1
T	15	Jan	Particle Size Distributions	Hinds 4
Th	17	Jan	Particle Size Distributions	Hinds 4
T	22	Jan	Aerosol Composition	Hinds 14
Th	24	Jan	Gases	Hinds 2
T	29	Jan	Uniform Particle Motion	Hinds 3
Th	31	Jan	Curvilinear Motion	Hinds 5
T	5	Feb	Adhesion; Brownian Motion and Diffusion	Hinds 6/7
Th	7	Feb	Cont. Brownian Motion and Diffusion	Hinds 7
T	12	Feb	Thermal/Radiometric Forces; Electrical Properties	Hinds 8/15
Th	14	Feb	Mass Transfer	Hinds 13
T	19	Feb	Coagulation	Hinds 12
Th	21	Feb	Nucleation	Hinds 13
T	26	Feb	Cloud Physics	Hinds 13
Th	28	Feb	Midterm Exam 1	
T	5	Mar	Spring Break (NO CLASS)	
Th	7	Mar	Spring Break (NO CLASS)	
T	12	Mar	Cont. Cloud Physics	Hinds 13
Th	14	Mar	Closure Studies and Instruments	
T	19	Mar	Aerosol Thermodynamics, Field Data	
Th	21	Mar	Production of Test Aerosols	Hinds 21
T	26	Mar	Filtration/Inlets/Sampling	Hinds 9/10
Th	28	Mar	Swagelok and Tools	
T	2	Apr	Lab Tour	
Th	4	Apr	Health Effects	Hinds 11
T	9	Apr	Optical Properties	Hinds 16
Th	11	Apr	Activity: In-Class debate about cigarette health effects	
T	16	Apr	Activity: Aerosol-Cloud Interactions	
Th	18	Apr	Activity: Ambient Data	
T	23	Apr	Activity: Geo-engineering	
Th	25	Apr	Potential project presentations	
T	30	Apr	Potential project presentations	
Th	2	May	Reading Day: No Class	
Th	9	May	Final Exam (08:00-10:00)	

Classroom Behavior Policy

To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed. To that end, our focus is on the tasks at hand and not on extraneous activities (i.e. texting, chatting, reading a newspaper, making phone calls, web surfing, etc).

Students are asked to refrain from disruptive conversations with people sitting around them during lecture. Students observed engaging in disruptive activity will be asked to cease this behavior. Those who continue to disrupt the class will be asked to leave lecture or discussion and may be reported to the Dean of Students.

Threatening Behavior Policy

The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to one's self. See: http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students.

Accessibility and Accommodations

At the University of Arizona we strive to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability or pregnancy, you are welcome to let me know so that we can discuss options. You are also encouraged to contact Disability Resources (520) 621-3268 to explore reasonable accommodation.

Please be aware that the accessible table and chairs in our classroom should remain available for students who find that standard classroom seating is not usable.

Code of Academic Integrity

Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See: http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity.

The University Libraries have some excellent tips for avoiding plagiarism available at: http://new.library.arizona.edu/research/citing/plagiarism.

Selling class notes and/or other course materials to other students or to a third party for resale is not permitted without the instructor's express written consent. Violations to this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions. Additionally, students who use D2L or UA email to sell or buy these copyrighted materials are subject to Code of Conduct Violations for misuse of student email addresses. This conduct may also constitute copyright infringement.

UA Nondiscrimination and Anti-harassment Policy

The University is committed to creating and maintaining an environment free of discrimination, http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy

Our classroom is a place where everyone is encouraged to express well-formed opinions and their reasons for those opinions. We also want to create a tolerant and open environment where such opinions can be expressed without resorting to bullying or discrimination of others.