

Course Syllabus	<p>Air Pollution 1. Gases (3 units)</p> <p>ATMO 469a/569a</p> <p>Description: An introduction to the chemistry and physics of the troposphere and stratosphere. Topics include natural biogeochemical cycles; atmospheric photochemistry; stratospheric ozone; urban ozone and particulate matter; atmospheric visibility; acid deposition; air pollution meteorology; Gaussian plume model; photochemical model; air quality regulations. Graduate-level requirements include additional homework and other exercises.</p>
Learning Outcomes	<p>The essential goal of the course is to have students apply principles of physics, mathematics, chemistry, and other natural sciences to understand atmospheric chemistry phenomena. The following specific learning outcomes are expected.</p> <ul style="list-style-type: none"> • Use laws of physics and chemistry to explain the evolution and chemical composition of the atmosphere spanning a broad range of spatial and temporal scales. • Apply the laws of photochemistry, chemical kinetics and thermodynamics to understand atmospheric chemistry issues including air pollution, stratospheric ozone, and climate change. • Apply mathematical and chemical tools to study atmospheric processes. • Understand the applications of atmospheric chemistry. • Demonstrate critical and analytical skills to interpret and predict atmospheric chemical phenomena
Evaluation	<p>Student learning outcomes are assessed by:</p> <ul style="list-style-type: none"> • Quantitative assignments • Quizzes and tests • Term project • Group discussion sections in which problems are analyzed and questions are raised and addressed
Prerequisite:	MATH 223, PHYS 141 or consent of instructor
Instructor:	Professor Eric A. Betterton
Grader:	TBD
Office Hours:	By appointment. Please e-mail Sarah Warren sdotwarren@atmo.arizona.edu
TA:	None

Required Text:	Seinfeld, J.H., and S.N. Pandis (2016), <i>Atmospheric Chemistry and Physics: From Air Pollution to Climate Change</i> (3 rd Ed.), New Jersey, John Wiley & Sons, Inc. Lectures and readings are complimentary. Specific pages will be provided during class. The textbook material is examinable.
Supplemental Free Online Textbook	Practical Meteorology - R. Stull 2015
Recommended Texts:	Walker, G., <i>An Ocean of Air. Why the Wind Blows and Other Mysteries of the Atmosphere</i> , Harcourt (2007). Hobbs, P. (2000), <i>Basic Physical Chemistry for the Atmospheric Sciences</i> (2 nd Ed.), Cambridge Univ. Press. Pitts, B.J., and J.N. Pitts (1986), <i>Atmospheric Chemistry: Fundamentals and experimental techniques</i> , John Wiley & Sons.
Homework:	Approximately eight during the semester.
Examinations:	Two mid-terms and a final exam
Grading Policy:	Regular grades are awarded for this course: A B C D E. Performance will be evaluated through attendance, homework assignments, two mid-terms and a final exam. Graduate students will be graded on separate criteria. Specifically, they will be assigned more advanced homework and examinations commensurate with the higher level of performance expected of them. Graduate students will also be required to complete a term assignment. The course grade will be weighted as follows: Undergraduates: Homeworks = 40%, Exams = 3x20% Graduates: Homeworks = 30%, Exams = 3x20%, Assignment = 10%
Student Responsibilities:	You are expected to follow the University of Arizona Code of Academic Integrity and to treat fellow students, teaching assistants, and the instructor with courtesy and respect. Participate actively in the learning process by reading textbook assignments as they are given, thinking about what you are writing as you take notes in class, completing and turning in assignments on time, and asking questions about confusing class or textbook material.

	<p>The UA Code of Academic Integrity, Code of Conduct and Student Code of Conduct are strictly followed. All students are responsible for knowing the codes and abiding by them. See http://deanofstudents.arizona.edu/academicintegrityforstudents.</p> <p>There is zero tolerance for breaches of academic integrity an academic code violation will be issued if such occurs.</p> <p>Please turn off your cellular phone before class.</p>
Students with Disabilities:	<p>Accessibility and Accommodations: It is the University’s goal that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know immediately so that we can discuss options. You are also welcome to contact Disability Resources (621-3268) to begin this conversation or to establish accommodations.</p>
Absence and Class Participation Policy	<p>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</p> <p>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.</p> <p>Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See: https://deanofstudents.arizona.edu/absences</p>
Threatening Behavior Policy	<p>The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to oneself. See http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students.</p>
Accessibility and Accommodations	<p>Our goal in this classroom is that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know immediately so that we can discuss options. You are also welcome to contact the Disability Resource Center (520-621-3268) to establish reasonable accommodations. For additional information on the Disability Resource Center and reasonable accommodations, please visit http://drc.arizona.edu.</p> <p>If you have reasonable accommodations, please plan to meet with me by appointment or during office hours to discuss accommodations and how my course requirements and activities may impact your ability to fully participate.</p> <p>Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.</p>
Code of Academic Integrity	<p>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</p>

	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 .
UA Nondiscrimination and Anti-harassment Policy	The University is committed to creating and maintaining an environment free of discrimination; see http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy
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 (e.g., texting, chatting, reading a newspaper, making phone calls, web surfing, etc.).
Subject to Change Statement	Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.