

Air Pollution, ATS555

Colorado State University

Fall 2023

Mondays and Wednesdays @ 4:00 – 5:15

Room: 112 Natural Resources

Instructor: Dr. Jeffrey Pierce (jeffrey.pierce@colostate.edu), Atmos. Sci. Main 220
<http://pierce.atmos.colostate.edu>

Office hours: By appointment (could be in person in ENGR A102F before classes or by Zoom)

Teaching assistant: Sam O'Donnell (samuel.odonnell@colostate.edu)

Office hours: By appointment (could be in person in ENGR A102F before classes or by Zoom)

Prerequisites: CHEM 113 and (MATH 261 or MATH 340) and (PH 122 or PH 142).

Class Website: Canvas for ATS555 (<http://canvas.colostate.edu/>)

Q&As through Slack: TBD

Live-streaming and recorded lectures: At this point, we don't have a plan to stream/record lectures (not an Echo360 classroom).

Optional Textbook: Air Pollution: Engineering, Science, and Policy, by Sternberg, College Publishing, 2015.

Objectives:

Our overall goal will be to develop a working knowledge of basic air-quality issues. Specific objectives include:

1. Develop an understanding of types and sources of air pollution.
2. Examine concentrations of air pollutants and their effects on health and welfare. Review regulations governing air pollution.
3. Examine the meteorological factors that contribute to air-quality degradation.
4. Examine the basic chemistry of the atmosphere and how it contributes to secondary pollutant formation.
5. Consider methods for air-pollution measurement and control.
6. Examine indoor, regional, and global air-pollution issues.

Course structure:

The course is offered for three credits. The class is conducted in an in-person lecture/discussion format. PDF files of course notes, slides, and links to recordings will be made available on Canvas after each class session.

Because of the uncertainty in the format of the course moving forward, some students not wanting to attend face-to-face lectures, and the challenges of virtual exams, there will be no quizzes/tests/exams this semester.

Several **homework assignments** will be made during the semester.

For each week of lectures, there will be a **weekly quiz** of several short-answer questions done through Canvas to evaluate the class's understanding of the lectures. The students will generally have several days to complete each quiz.

A short **term presentation** on an air quality topic is required. The presentations will be in the second half of the course and may be done virtually or face-to-face if allowed (still with the virtual option). Details on format and timetable will be discussed later.

Grading:	Homework	30%
	Weekly quizzes	30%
	Term presentation.....	30%
	Participation	10%

Topics	Optional textbook reading in addition to course notes
Introduction/Air Pollution History	Chapter 1
Air Pollution Types, Atmospheric Composition, Concentrations, and Sources	Chapters 1 and 2
Particulate Matter	Chapter 8
Visibility	Chapter 7.4
Air Pollution Meteorology	Chapter 5
Dispersion of Air Pollutants	Chapter 6
Indoor Air Quality (guest lecture by Ellison Carter) Date: 10/30	Chapter 15
Exposure, and Health and Welfare Effects (guest lectures by Drs. John Volckens and Sheryl Magzamen) Dates: 11/6, 11/13	Chapters 8.3, 9.3, 10.3, 11.1.3, 12.1.3, 13.1.2
Air Pollution Regulation (guest lectures by Greg Zwickle), Dates: TBD	Chapters 3, 8.4, 9.4, 10.4, 11.1.5, 12.1.4, 13.1.3
Combustion and Gas control	Chapters 9 and 10
Mobile Sources	Chapter 16
Aerosol Physics and Control	Chapters 7 and 8

Photochemistry and ozone	Chapters 11 and 12
Climate Change	Chapter 14
Term presentations	
Dates: 12/8, 12/10	

CLASS POLICIES

UNIVERSITY POLICIES: Students are expected to follow the CSU Student Honor Pledge (<https://tilt.colostate.edu/Integrity/Pledge>). This course will adhere to the CSU Academic Integrity Policy as found in the General Catalog (<https://catalog.colostate.edu/general-catalog/academic-standards/academic-policies/>) and the Student Conduct Code (<https://resolutioncenter.colostate.edu/wp-content/uploads/sites/32/2018/08/Student-Conduct-Code-v2018.pdf>). At a minimum, violations will result in a grading penalty in this course and a report to the Office of Conflict Resolution and Student Conduct Services.

POLICY ON COLLABORATION: Students are encouraged to discuss homework assignments. However, each student must complete their own assignment. If I determine that students are simply copying assignments, I will pursue action through the Office of Academic Integrity.

POLICY ON LATE ASSIGNMENTS: Late homework assignments will not be accepted unless discussed and approved prior to the due date, but I will drop the assignment with the lowest score. Late weekly quizzes will not be accepted unless discussed prior to the due date .

POLICY ON REMARKING HOMEWORK: Students who disagree with how their assignment, test, or project has been marked should resubmit their work with a written explanation of their concern. The work will be re-evaluated by the instructor in its entirety.