ATMO 2100: AIR POLLUTION AND ATMOSPHERIC CHEMISTRY

TEXTBOOK: FREE online resources! Please check canvas regularly for links to readings.

COURSE TECHNOLOGY: Internet connection, Canvas, video playing (Youtube, Vimeo, Kaltura, etc.), SLCC ePortfolio, Zoom, Google Apps (slides, sheets, etc.).

COURSE DESCRIPTION

The course explores the human and natural contributions to air pollution in our atmosphere. Students will apply basic principles of physics, chemistry, and meteorology to analyze the processes that control the chemical composition of the Earth's atmosphere. Topics covered will include temperature inversions and their impact on air pollution, health effects of air pollution, techniques for improving air quality, and more.

COURSE LEARNING OUTCOMES

In order to fulfill the goals of the College-wide Learning Outcomes, the following course learning outcomes of been established for this course. Upon completion of this course a student should be able to:

- Construct a model of how pollutant emissions, meteorology, geography, and atmospheric chemistry determines local and regional air quality.
- Calculate and distinguish the impacts of natural and human caused pollutant emission impact atmospheric concentrations.
- Evaluate the human health impacts of different air pollutants, and consider how pollutant exposure is related to environmental justice.
- Justify pollution control methods based on collected evidence, including effectiveness, cost, and feasibility.
- Differentiate the air quality problems in different cities or countries and formulate solutions that will be effective in each location.
- Diagram key chemical reactions and physical transformations that modify concentrations of air pollutants in the atmosphere.
- Synthesize the connections between air pollutant emissions and other aspects of human society including economics, energy supply, water supply, transportation, and public health.
- Outline air pollutant impacts on natural systems including, water quality, ecosystems, weather, and climate.
- Predict pollutant concentrations and air quality based of collected emissions, meteorological, topographical, and other data.
- Examine past, current, and potential future air pollution regulations nationally and internationally and analyze their effectiveness, and ability to achieve environmental justice.
- Develop and implement a project that serves a community need and applies your skills and knowledge of air pollution or atmospheric chemistry.

HOW TO DO WELL IN THIS CLASS

- Be an active participant by attending and participating in class, engaging in canvas, and asking and answering questions.
- Keep up with readings every week.
- Complete all assignments.
- Message me or come to office hours with questions or concerns.

COURSE PROCEDURES

Active participation in activities is expected. You will be expected to interact with others during class and participate in group discussions.

Most of the assignments you complete for the course will be submitted online using Canvas LMS. Please note that you can set up social media services in Canvas within your profile settings. There are also Canvas apps available. Some assignments may be difficult to complete on a tablet or phone. It is HIGHLY recommended you set up Canvas so it can send you messages to your email, cell phone, Facebook, or Twitter accounts. When your instructor sends out announcement, messages, and information on Canvas, you will be notified in the media you designate.

LATE WORK

Students are expected to complete all assignments on time. Late work will be accepted, but it is in your best interest to hand all assignments in on time.

INCOMPLETE GRADES

If circumstances lead you to not be able to complete the course in the regular time frame, you may work with the instructor to take an incomplete. Students must be passing and have completed 75% of the course work in order to be granted an incomplete. Students are responsible for planning for successful course completion.

GRADING SCALE

93-100 = A	90-92 = A-	87-89 = B+	84-86 = B	80-83 = B-	77-79 = C+
74-76 = C	70-73 = C-	67-69 = D+	64-66 = D	60-63 = D-	0-59 = E

RESOURCES FOR STUDENTS

General Learning Support & Tutoring Services provide support for SLCC students enrolled in any class at the College. All resources are provided free-of-charge. Ask your instructor about discipline-specific learning support and tutoring services.

- **Tutoring**: index of all tutoring resources.
- **STEM Learning Centers**: provide free assistance in Math, Science, Accounting, CSIS and Allied Health Classes at 6 campus locations.
- **Student Writing and Reading Center**: provides in-person and online feedback on all writing assignments.
- **Library Services**: provides research help, print and online resources, computers and study space.
- **ePortfolio Lab**: provides drop-in assistance for all ePortfolio questions.
- **eLearning Support**: provides support for navigating online and hybrid classes.

Advising and Counseling Support Services provide support for students enrolled in any class as the college.

- **Center for Health and Counseling**: provides health care, mental health counseling, massage therapy services and healthy lifestyle programs.
- **Veterans' Services**: assists hundreds of students in using their VA education benefits each semester.
- **Academic and Career Advising**: helps students plan, explore, make decisions, access resources and evaluate their academic and career goals.
- **#SLCCSafe**: Resources for students to succeed during the pandemic

ASSIGNMENTS

Assignment Type	Points	Total	Percent
CQ: Chapter Quizzes (9) [drop 1]	8 @ 5 points	40	20%
HW: Homework (6) [drop 1]	5 @ 10 points	50	25%
IL: Interactive Labs (6) [drop 1]	5 @ 10 points	50	25%
R: Research Project (8)	5 @ 10 points 2 @ 5 points	60	30%
	Grand Total	200	100%

CHAPTER QUIZZES

For each set of readings covered there will be a multiple choice, timed quiz on Canvas. It will generally be due by midnight on the first day that the Chapter is covered in class. The quizzes will be worth 5 points each and they will comprise 20% of your final grade.

HOMEWORK

About every other week you will have a 1–2-hour homework assignment. Generally, it will involve watching a video, reading an article, or completing a tutorial, and responding to questions and submitting on Canvas. The Homework assignments will usually be due on Thursday nights by midnight. Homework assignments will be worth 10 points each and they will comprise 25% of your final grade.

INTERACTIVE LABS

About every other week we will have an interactive in class activity that will be graded. The interactive lab might occur on any of the class days during the week. In class interactive labs will be worth 10 points each and they will comprise 25% of your final grade.

RESEARCH PROJECT (ePortfolio Signature Assignments)

During the semester you will complete a research project to enhance your learning, critical thinking, and research skills. It is composed of 7 parts that will be completed throughout the semester and will comprise 30% of your final grade. The project will be presented at the Air Quality: Science for Solutions Conference (Mar. 28). Included in the project will be, project design, background research, data collection, data analysis, abstract writing, poster presentation, and oral presentation.

ADDITIONAL RESOURCES

- Air Quality Science for Solutions Conference: https://aq.byu.edu/
- Intro to Atmospheric Chemistry by Daniel J. Jacob: https://acmg.seas.harvard.edu/education/introduction-atmospheric-chemistry
- EPA Air and Radiation: https://www.epa.gov/environmental-topics/air-topics
- Utah Division of Air Quality: http://www.airquality.utah.gov/

CLASS SCHEDULE: This is subject to change, so make sure check Canvas regularly.
Please see Canvas for online READINGS for each Module.

MOD	TOPIC/READING	DUE
R	Class Introduction & Preview	
1 & R	1: OVERVIEW: Air Pollution: https://test-learnermedia.pantheonsite.io/wp-content/uploads/2019/07/unit11.pdf Research Project: Hypothesis, Variables, and Project Plan	CQ-1, HW-1, IL-1 **R-1**
2	2: MONITORING: Our Nation's Air: https://gispub.epa.gov/air/trendsreport/2023/#welcome	CQ-2, HW-2
R	Research Project: Background Research and Methods	**R-2**
3	3: MANAGEMENT: Air Quality Management in the United States *Introduction & Summary: http://www.nap.edu/catalog/10728/air-quality-management-in-the-united-states Urbanization and Air Pollution: Then and Now: https://eos.org/features/urbanization-air-pollution-now	**CQ-3, IL-2**
R	Research Project: Writing your Abstract	**R-3**
R	Research Project: Data Analysis & Abstract Submission	**R-4**
4	4: SECONDARY POLLUTION: Atmospheric Chemistry and Air Pollution: https://www.hindawi.com/journals/tswj/2003/497142/abs/	CQ-4, IL-3
R	Research Project: Data Analysis & Research Poster Draft	**R-5**
5	5: WILDFIRES: Wildfires and Air Pollution: http://assets.climatecentral.org/pdfs/WildfiresAndAirPollution.pdf *March 19: Last Day to Withdraw (No refunds)*	CQ-5, HW-3
R	Research Project: Poster Presentation	**R-6**
6	6: DUST STORMS: The Dust Detectives: http://www.hcn.org/issues/46.22/the-dust-detectives	CQ-6, HW-4
7	7: ECOSYSTEMS: Threats From Above: http://www.caryinstitute.org/sites/default/files/public/reprints/Threats_From_Above.pdf Mercury Contamination of Aquatic Ecosystems: http://pubs.usgs.gov/fs/1995/fs216-95/pdf/fs21695.pdf	CQ-7, HW-5, IL-4
8	8: IMPACTS ON CLIMATE: Greenhouse Gas Emissions (EPA): https://www.epa.gov/ghgemissions/overview-greenhouse-gases	CQ-8, HW-6, IL-5
9	9: IMPACTS ON HEALTH: Health Effects of Air Pollution: https://www.sciencedirect.com/science/article/pii/S0269749107002849	CQ-9, IL-6
FW	**Research Project Presentations & Reflection**	**R-7**