Technical Elective: Air Pollution Engineering and Management
Course Number: 312224030
Syllabus

Instructor: Sophia Zuoqiu, D. Sc.
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Office: SCUPI Building, Office 423
Office hour: Wednesday 10am-12pm, Thursday 11am-1pm

Lecture Time: Wednesday 1:50pm-4:25pm
Lecture Location: SCUPI Building Room N209

Note: This syllabus is subject to change.

Course Description

This is a comprehensive course on air pollution. The course contains three modules. The first module is an introduction to air pollution, which will cover the fundamentals of air pollution such as the chemical reactions and aerodynamics. The second module will be on the history and the current state of air pollution research, with a focus on monitoring and modelling. The third module will build on the first and second modules by connecting the basics of air pollution to climate change, global health, and China's "Double Carbon" goal.

Course Objectives

The main objective of this course is to advance students' previous learning by connecting engineering concepts to real world applications. Students should be able to 1)develop comprehensive understanding of air pollution in the rapidly changing global environment, 2) form evidence-based thinking about key concepts such as aerodynamics and air pollution exposure, and 3) become familiar with models and tools that are used for assessing and conducting research on air pollution.

Course credit hours: Three (3) **Course prerequisite:** None

Grading

Attendance and Class participation:	10%
Weekly report:	10%
In-class quiz:	10%
Group project:	20%
Midterm exam:	20%
Final exam:	30%

Audio-Video Recording Policy

To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion, and activities without the advance written permission of the instructor, and any such recording properly approved in advance should be used solely for the student's private use.

Policy on Utilization of Artificial Intelligence

Students in this course may choose to incorporate artificial intelligence (AI) in the following aspects of their study: information gathering, coding, translation/interpretation, visualization, cross-referencing, and other relevant and efficient ways for self-learning. Students are EXCPLICITLY FORBIDDEN from using AI to 1) complete the logic of the assigned task and 2) perform entire assigned tasks. If students choose to incorporate AI, they MUST explicitly disclose the following information: 1) acknowledgement of the AI program/platform, 2) proportion/percentage contribution from AI, 3) prompts/logic/questions used to elicit AI response. All the materials must be submitted before receiving credit for the assigned task/homework/group work. Unacknowledged AI contribution will result in automatic "0" in the assigned task/assigned (if it is individual work, the individual student will receive no credit; if it is group work, the entire group will receive no credit). Additionally, AI-generated content can contain inaccuracies, it is the student's responsibility for verifying the factual correctness. Students are strongly encouraged with consult with teaching team for incorporation and acknowledgement of AI utilization before proceeding.

Tentative Topics & Schedule*

Module I:
Lecture 1 Introduction to air pollution science

Lecture 2 Evaluating air quality: science and myth

Lecture 3 Fundamentals of air pollution I: particles, aerosols

Lecture 4 Fundamentals of air pollution II: gases

Lecture 5 Fundamentals of air pollution III: organic matters

Module II:

Lecture 6 Indoor air pollution I: Fundamentals

Lecture 7 Introduction to air pollution research; Guest Lecture ***(tentative)***

Lecture 8 Field trip to see monitoring station(***tentative, date subject to change***)

Lecture 9 Air pollution research and modelling; Review for Midterm

Lecture 10 Midterm exam

Lecture 11 Carbon, energy and global climate change in the context of air pollution

Module III:

Lecture 12 Air pollution mitigation: policies and technology

Lecture 13 Urbanization and air pollution; Calculating the burden of air pollution;

Lecture 14 ***Guest lecture (tentative);*** Group project (structured work)

Lecture 15 Group project presentation. Course review

Lecture 16 Final Exam

*No class on Oct 1st due to National Holiday break.