

Syllabus

Course:	CLIMATE 463: Air Pollution Meteorology
Times:	Tuesday – Thursday, 10:00AM-11:30AM – Room 2238
Instructor:	Frank J. Marsik, PhD
Office:	2543C Space Research
Office Hours:	After class or by appointment
Phone:	763-5369
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COURSE SUMMARY:

Over recent decades, considerable progress has been made in the reduction of ambient concentrations of a number of pollutant species that have been shown to have harmful impacts on human health and welfare. Over time, however, we have continued to discover new pollutants which are found to stress the environment. With rollbacks in recent environmental policy being considered/implemented by the federal government, it will be important to monitor whether such actions walk back the progress that has been made.

The understanding of the cycling of some pollutant species is complicated by the fact that some of these species also have both anthropogenic (related to human activities) and natural emissions sources. Meteorology represents one of the major influences that determines the scale and magnitude of the impact of releases of pollutants on a particular location. This course will present an overview of pollutants of concern and the policies that have been put into place to control their impact on human health and the environment. This course will predominantly look at global, regional and local meteorological processes which control the transport, transformation and fate of anthropogenic pollutants.

COURSE MATERIALS:

This course does not have a required textbook. However, material presented in this class will likely be taken from the following texts:

- *Air Pollution Meteorology and Dispersion* by S. Pal Arya
- *Fundamentals of Air Pollution* by Daniel Vallero
- *Atmospheric Science: An Introductory Survey* by John Wallace and Peter Hobbs

This latter text has been made available on our Canvas course website. Additional Materials will be taken from a variety of sources which will be handed out, as needed

GRADING AND EXAM DETAILS:

The final course grades will be determined using the following guidelines:

Homework	35%
Hourly Exam #1	20%
Hourly Exam #2	20%
Term Project	20% (15% for paper; 5% for presentation)
Mandatory Office Hours	05%

HOMEWORK: There will be a number of homework assignments that help to underscore the material covered in class. These assignments will be due in class on the assigned due date. Assignments may be turned in late with prior permission only. Assignments turned in late without permission will have one point deducted for each day that assignments are late. If assignments are not turned in within one week of the assigned due date, the student will receive no credit for the assignment. You will receive an incomplete for the term until all assignments have been completed.

EXAMS: There will be two hourly exams, tentatively set for February 21st and April 11th.

TERM PROJECT: To help underscore the material covered in class, each student will be required to complete a term project. In general, each student will select one urban area as a study site to focus on. Throughout the term, there will be a series of mini-reports/presentations due. At the end of the term, these mini-reports will be merged into a final term project report. The details for the project will be provided in a separate handout. Each person will be responsible for putting together a 15 minute presentation at the end of the term. These presentations will be given on April 16th and 18th. Each person will submit a final term paper (8 to 10 pages, plus figures). The due date for the term papers will be Thursday, April 25th.

IMPORTANT DATES: We will **not** have class on the following days:

- March 6th and March 8th (Spring Break)

HONOR CODE: In general, you are expected to following the College of Engineering Honor Code Guidelines <https://elc.engin.umich.edu/honor-council/>. With respect to homework assignments, while you are allowed to work on homework assignments together, the assignment that you turn in must represent your own work.

ELECTRONIC DEVICE POLICY: Unless you have a compelling reason for need to have your cell phone out during class (family emergency, etc.), please put it away during class time. I, and guest speakers, will appreciate the courtesy.

IMPORTANT NOTE: **If the due date for any assignment or exam conflicts with a religious holiday that you observe, please see me at least one week in advance to make alternate arrangements.**

Course Topics ⁽¹⁾

1. The Earth's Atmosphere (chemical structure)
2. Sources of Air Pollution
3. Effects of Air Pollution
4. Air Pollution Policy
5. Air Pollution Controls
6. The Earth's Atmosphere (thermal structure)
7. Atmospheric Transport
8. Boundary Layer Processes
9. Atmospheric Removal Processes
10. Air Pollution Monitoring
11. Air Pollution Modeling

(1) This outline is a starting point. There may be need to add or subtract certain topics, or perhaps swap locations. Time will tell.....

Poetry

Pablo Neruda

And it was at that age ... Poetry arrived in search of me.
I don't know, I don't know where it came from,
from winter or a river. I don't know how or when,
no they were not voices, they were not words, nor silence,
but from a street I was summoned, from the branches of night,
abruptly from the others, among violent fires or returning alone,
there I was without a face and it touched me.

I did not know what to say, my mouth had no way with names,
my eyes were blind, and something started in my soul,
fever or forgotten wings, and I made my own way,
deciphering that fire,
and I wrote the first faint line, faint, without substance,
pure nonsense, pure wisdom
of someone who knows nothing, and suddenly I saw
the heavens unfastened and open, planets,
palpitating plantations, shadow perforated,
riddled with arrows, fire and flowers,
the winding night, the universe.

And I, infinitesimal being, drunk with the great starry void,
likeness, image of mystery,
felt myself a pure part of the abyss,
I wheeled with the stars,
my heart broke loose on the wind.