Course description: Fundamental and advanced theories of air pollution and atmospheric science. Air pollution causes and impacts; atmospheric chemistry and physics; meteorology; and an introduction to air quality models. Control technology of particulate and gaseous air pollutants; process design variables; and industrial and engineering applications of control technologies.

Prerequisite(s): MEEN 3110 or consent of department.


Course contents:

1. Air Pollution Overview
   a) Introduction
   b) Atmospheric Chemistry and Physics
   c) Air Pollution and Meteorology
   d) Air Pollution Impacts
   e) Air Quality Monitoring
   f) Atmospheric Dispersion Modeling

2. Particulate Matter Control
   a) Cyclones
   b) Electrostatic Precipitators
   c) Fabric Filters
   d) Particulate Scrubbers

3. Gaseous Pollutant Control
   a) VOC Incinerators
   b) Gas Adsorption
   c) Gas Absorption
   d) Biological Control of VOCs and Odors
   e) Control of Sulfur Oxides
   f) Control of Nitrogen Oxides
   g) Control of Carbon Dioxide

4. Other Sources and Controls
   a) Control of Mercury Compounds
   b) Mobile Source Control Technologies

5. Case Studies in Air Pollution Control Engineering
   a) Urban and Industrial Pollution
Course objectives: Course objectives are: (1) to provide students with fundamental concepts of air pollution science and engineering; (2) to provide an in-depth review of sources of air pollution and engineering controls; (3) to provide case-study based analyses of environmental impacts and applications related to energy industries.

Learning outcomes:

1. Knowledge of the fundamental concepts of air pollution science and engineering
2. Knowledge of global and societal issues related to air pollution
3. Ability to identify, formulate, and solve engineering problems
4. Ability to evaluate and use principles of stoichiometry, chemical kinetics, and thermodynamics
5. Knowledge of industrial practices for environmental control
6. Performing on a team-based research project

Course format: 3 hours of lecture per week; Mon & Wed 5:30 – 6:50 p.m.

Office hours: Mon & Wed 3:00 – 5:00 p.m.; F101K

Grading:

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<tr>
<th>Component</th>
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<tr>
<td>Class participation</td>
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<tr>
<td>Homework</td>
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<tr>
<td>Midterm exam I</td>
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<td>Midterm exam II</td>
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<td>Final exam</td>
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<td>Term project</td>
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Disabilities accommodation: The University of North Texas complies with Section 504 of the 1973 Rehabilitation Act and with the Americans with Disabilities Act of 1990. The University of North Texas provides academic adjustments and auxiliary aids to individuals with disabilities, as defined under the law. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring accommodation, please see the instructor and/or contact the Office of Disability Accommodation at 940-565-4323 during the first week of class.
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