CEE490/ENVH 461 Air Pollution Control Autumn 2009

Class Time: 10:30-12:20 Tues & Thursday Credits: 4 More 220

Course web site: http://courses.washington.edu/cee490

Description: Fundamental concepts of air pollution control. Emission sources, atmospheric dispersion, ambient concentrations, adverse effects, governmental regulations, emission standards, air-quality standards, processes and equipment for controlling emissions.

Prerequisites: Senior standing in engineering or science.

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Optional Text: *Air Pollution: Its Origin & Control* (2nd or 3rd Edition) by Wark, Warner, & Davis Used available at Abebooks: http://www.abebooks.com/

Course Grade: Approximately: Homework 30%, Midterm 35%, Final 35%. Homework will be due at class time (usually at the beginning of the class) and written on paper.

Tentative Lecture Schedule Pages in Wark, Warner, & Davis

1.	**Sept 30**	**Air pollutants, effects, emissions, sources**	**Quiz 1**	**1-54**
2.	**Oct 1**	**Government regulations, air quality stds, emission stds**		**61-104**
3.	**6**	**Global issues, meteorology, dispersion of air pollution**		**109-142**
4.	**8**	**Dispersion of air pollution in the atmosphere**		**143-187**
5.	**13**	**EPA dispersion models, SCREEN3 and TSCREEN**		
6.	**15**	**Application of SCREEN3; Photochemical smog**		**471-480**
7.	**20**	**EKMA model for reducing HC & NOx to meet ozone air quality standards**		**480-488**
8.	**22**	**Motor vehicle emissions of air pollutants**	**Quiz 2 (take home)**	**489-524**
9.	**27**	**Auto emission controls, catalytic auto emission control**		
10.	**29**	**Midterm Exam**		
11.	**Nov 3**	**Auto emission controls, new technology (fuel cells, hybrids)**		
12	**5**	**Control of particulate air pollutant emissions**		**188-218**
13,	**10**	**Particle emission control equipment**		**218-293**
14.	**12**	**Particle emission control equipment and processes**		
15.	**17**	**Control of emissions of gases & vapors: Adsorption & absorption**		**294-339**
16.	**19**	**Control of nitrogen oxides from stationary sources**		**430-470**
17.	**24**	**Case studies**		
18.	**Dec 1**	**Case studies of air pollution control issues**		
19.	**3**	**Case studies of air pollution control issues**		
20.	**8**	**Case studies of air pollution control issues.**		
21.	**10**	**Case studies of air pollution control issues.**		
21	**14**	**Final Exam 10:30-12:20 (Monday)**		

Case studies may include: Acid rain, control of particulate and sulfur dioxide emissions from Centralia Coal-Fired Power Plant (electrostatic precipitator for particle control, limestone slurry scrubber for sulfur dioxide control), Spokane municipal incinerator (ammonia injection to reduce NOx concentration, wet-dry acid gas absorption with lime slurry & filter baghouse to collect particulates), thermal desorption of hazardous organics from soil ("dirt burning"), emission controls on diesel engines including diesel particulate filter, oxidation catalytic converter to reduce hydrocarbons & CO, and urea injection + selective catalytic regeneration to reduce NOx), odor control at wastewater treatment plants (Brightwater).