

CE370 – INTRODUCTION TO ENVIRONMENTAL ENGINEERING

SPRING 2010

10:10 am - 11:00 am MWF

114 Earth and Engineering Sciences Building

Instructor: Dr. Bill Burgos Telephone: 863-0578
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Office Hours: 11:00am-12:30pm Tue, 3:30-5:00pm Wed, other times by appointment

Prerequisites: CHEM 110 and MATH 111 or 141

Course Objectives: 1) Develop students' environmental literacy and promote interest in careers in environmental engineering. 2) Introduce students to the basic principles of science and engineering pertinent to the natural and engineered environment. 3) Introduce the various classes of pollution and the means to prevent and remediate their presence.

Textbook: Introduction to Environmental Engineering and Science, 3rd edition, 2008, G. M. Masters and W. P. Ela, Prentice-Hall, ISBN 0-13-601837-8; International version, ISBN 0-13-233394-6.

Grading:	Mid-Term Exam	150 pts	28.9 %
	Final Exam	150 pts	28.9 %
	Homework Sets (6 sets)	120 pts (20 pts each)	23.0 %
	In-Class Problem Sets (5 of 6 sets)	<u>100 pts</u> (20 pts each)	<u>19.2 %</u>
		520 pts	100 %

Mid-Term Exam: This exam will cover all material presented over the first 8 weeks of class. This exam will be a 50-min, in-class, closed-book test where students are allowed to bring one 8-½"×11" sheet of notes. This exam will be given Fr March 5, 2010.

Final Exam: This examination will be comprehensive for the entire semester and designed to test your general knowledge of the material. This exam will be a ~2-hr, in-class, closed-book test where students are allowed to bring one 8-½"×11" sheet of notes. This exam will be given on the appointed date/time of finals week.

Homework: Six homework sets will be assigned over the semester. Homework assignments will be announced in class and posted on ANGEL at least one week before their due date. Homework will serve as supplemental learning assignments where students must read the text and work through the problems themselves, however, the majority of problems are related to examples in the textbook. All homework due dates have already been assigned (see syllabus below). Individual work is required. Late homework will be accepted up to 3 days after the due date with a 15% penalty per day. For assignments requiring calculations, solutions are to be presented in a neat and orderly fashion on engineering computational paper (unless solution requires use of Mathcad and/or Excel). For discussion problems, solutions must employ a word processor. Hand written paragraphs are unprofessional and will not be accepted.

In-Class Problem Sets: Six in-class problem sets will be given over the semester, and will be unannounced. In-class problem sets will be based on and similar to homework problems. Solutions to in-class problem sets will be provided immediately afterwards, and students will grade one another's papers. If any type of collaboration between students during grading is discovered, all students involved will receive a failing grade for the assignment and be prosecuted to the fullest extent through the University's Academic Integrity Policies. Students will be allowed to drop their lowest score.

Date	Lecture Number, Topic	Reading	Homework/Exam
11-Jan	L1: Introduction	Ch 1: 1.1 - 1.2	
13-Jan	L2: Water Pollution, Water Resources	Ch 5: 5.1 -5.4	
15-Jan	L3: Liquid Assets, Water Infrastructure	view 2 nd half of video	Video
20-Jan	L4: Water Pollution, WW impacts to rivers	Ch 5: 5.5 -5.6	
22-Jan	L5: Stream Pollution Modeling	Ch 5: 5.6	
25-Jan	L6: Water Pollution, WW impacts to lakes	Ch 5: 5.7	
27-Jan	L7: Mass Balances	Ch 1: 1.3	
29-Jan	L8: Mass Balances, Idealized Reactors	Ch 1: 1.3, Ch 3: 3.2	HW #1 due
1-Feb	L9: Mass Balances, Non-steady state	Ch 1: 1.3	
3-Feb	L10: Energy Balances	Ch 1: 1.4	
5-Feb	L11: Beneficial Reuse in Centre County	Ch 6: 6.1-6.2	
8-Feb	L12: Environmental Chemistry, Equilibrium	Ch 2: 2.1 - 2.2	
10-Feb	L13: Environ Chem, Dissolution Reactions	Ch 2: 2.3 - 2.4	
12-Feb	L14: Environ Chem, Acid-Base Reactions	Ch 2: 2.3 - 2.4	HW #2 due
15-Feb	L15: Environ Chem, BOD	Ch 5: 5.5	
17-Feb	L16: Setting the Benchmark	ASCE paper	
19-Feb	L17: Primary Wastewater Treatment	Ch 6: 6.5	
22-Feb	L18: Secondary Wastewater Treatment	Ch 6: 6.5	
24-Feb	L19: Advanced Wastewater Treatment	Ch 6: 6.5	
26-Feb	L20: Gas Drilling in Marcellus Shale	current articles, video	HW #3 due
1-Mar	L21: Water Treatment for Marcellus Shale	handouts	
3-Mar	L22: Catch-up & Review		
5-Mar	L23: In-Class Mid-term Exam		Mid-term Exam
15-Mar	L24: Drinking Water Quality	Ch 6: 6.3-6.4	
17-Mar	L25: Drinking Water Treatment, Physical	Ch 6: 6.4	
19-Mar	L26: Drinking Water Treatment, Chemical	Ch 6: 6.4	
22-Mar	L27: Drinking Water Treatment, Advanced	Ch 6: 6.4	
24-Mar	L28: Proposed Landfill in Centre County	handouts	
26-Mar	L29: Solid Waste Management	Ch 9: 9.1-9.4	
29-Mar	L30: Solid Waste Management	Ch 9: 9.7-9.10	HW #4 due
31-Mar	L31: Air Pollution - NAAQS	Ch 7: 7.1 - 7.6	
2-Apr	L32: Air Pollution - Auto Emissions	Ch 7: 7.8	
5-Apr	L33: Air Pollution - Alternative Vehicles	Ch 7: 7.8	
7-Apr	L34: Air Pollution - Coal-fired Power Plants	Ch 7: 7.9	
9-Apr	L35: Air Pollution - Control Devices	Ch 7: 7.9	
12-Apr	L36: Coal Mining Methods	handouts	
14-Apr	L37: Impacts of Coal Mining in Pennsylvania	handouts	HW #5 due
16-Apr	L38: Global Climate Change	Ch 8: 8.1 - 8.3	Video
19-Apr	L39: Global Change, Greenhouse Effect	Ch 8: 8.4,8.6	
21-Apr	L40: Global Climate Change, Ocean Impacts	Ch 8: 8.12	
23-Apr	L41: Sustainable Development	handouts	
26-Apr	L42: "Smart Growth"	handouts	HW #6 due
28-Apr	L43: Green Buildings, LEED criteria	handouts	
30-Apr	L44: Catch-up & Review		
?-May			Final Exam