

Fall 2006  
CE 24L: Introduction to Environmental Engineering and Science

**Instructor:**

Claudia Gunsch, 127 Hudson Hall, [ckgunsch@duke.edu](mailto:ckgunsch@duke.edu), Phone: 660-5208

**Class Time:**

*Lectures (Hudson 125):* Tuesday and Thursday, 10:05-11:20

*Lab (Hudson 024C):* Section 1 – Tuesday, 4:25-5:40

Section 2 – Thursday, 4:25-5:40

**Teaching Assistant:**

Jeff Bandy, [jcb27@duke.edu](mailto:jcb27@duke.edu)

**Office Hours:**

Tuesday 2-3 or by appointment

**Textbooks:**

Principles of Environmental Engineering and Science by M.L. Davis and S. J. Masten, McGraw Hill Higher Education, 1<sup>st</sup> Edition

**Prerequisites:**

None

**Grading:**

Class Participation and Attendance: 5%

Homework: 20%

Laboratory Reports: 20%

Chemical of the Week Presentation: 5%

Indoor Air Project: 5%

Exam #1: 15%

Exam #2: 15%

Exam #3: 15%

Grades will be assigned on a curve based on the overall student performance in the course.

**Academic Integrity:**

<http://www.gradschool.duke.edu/Regulations/standards.htm>

**Bulletin Description:**

CE 24L. Introduction to Environmental Engineering and Science. Materials and energy balances applied to environmental engineering problems. Water pollution control, applied ecology, air quality management, solid and hazardous waste control. Environmental ethics.

## Class Schedule:

<i>Class Period</i>	<i>Date</i>	<i>Reading Assignment</i>	<i>Topic</i>
1	Aug-29	Chapter 1	Introduction
2	Aug-31	Chapter 2	Units
3	Sept-5	Chapter 3	Materials and Energy Balance (Part I)
<i>Pre-Lab Mtg.</i>	<i>Sept-5 and 7</i>	<i>Handouts</i>	<i>Lab Safety and Discussion about Indoor Air Project (Hudson 132 – Conf. Rm)</i>
4 (HW 1)	Sept-7	Chapter 3	Materials and Energy Balance (Part II)
5	Sept-12	Chapter 5	Risk Assessment
<i>Lab 1</i>	<i>Sept-12 and 14</i>	<i>Lab Handout</i>	<i>Why is the Water Green? Pollutant Effect of Nitrogen and Phosphorous</i>
6 (HW 2)	Sept-14	Chapter 8	Water Quality
7	Sept-19	Chapter 9	Drinking Water
<i>Lab 2</i>	<i>Sept-19 and 21</i>	<i>Lab Handout</i>	<i>Wastewater Treatment Activity Module</i>
8(HW 3)	Sept-21	Chapter 10	Wastewater
<b>9</b>	<b>Sept-25 Evening</b>	<b>N/A</b>	<b>EXAM #1 (Classes 1-7)</b>
10	Sept-26	Chapter 6	Hydrology
<i>Field Trip 1</i>	<i>TBD</i>	<i>N/A</i>	<i>Wastewater Treatment Plant</i>
11	Sept-28	Chapter 13	Hazardous Waste
12	Oct-3	Chapter 11	Historical Perspective and Regulations: Air Pollution
<i>Lab 3</i>	<i>Oct-3 and 5</i>	<i>Lab Handout</i>	<i>Oil Spill Bioremediation Module</i>
13 (HW 4)	Oct-5	Chapter 11	Ambient Air Pollution
14	Oct-12	Chapter 11	Air Pollution Meteorology and Global Warming
15	Oct-17	Class Notes	Indoor Air
<i>Field Trip 2</i>	<i>TBD</i>	<i>N/A</i>	<i>Air Treatment Field Trip</i>
16 (HW 5)	Oct-19	Chapter 12	Solid Waste
<b>17</b>	<b>Oct-23 Evening</b>	<b>N/A</b>	<b>EXAM #2 (Classes 7-15)</b>
18	Oct-24	Chapter 7	Geological Resources and Energy
<i>Lab 4</i>	<i>Oct-24 and 26</i>	<i>Lab Handout</i>	<i>Acid Rain Investigation</i>
19	Oct-26	Class Notes	Sustainability
20	Oct-31	Class Notes	Green Engineering
21 (HW 6)	Nov-2	Class Notes	SPEAKER/Indoor Air (Dr. Wayne Thomann)
22	Nov-7	Class Notes	SPEAKER/Disaster Relief (Dr. David Schaad)
<i>Field Trip 3</i>	<i>TBD</i>	<i>N/A</i>	<i>Hazardous Waste Field Trip</i>
23 (HW 7)	Nov-9	Class Notes	SPEAKER/Environmental Consulting (Industry Representative)
24	Nov-14	Class Notes	SPEAKER/Technology for Developing Countries (Dr. Andrew Schuler)
25 (HW 8)	Nov-16	Class Notes	SPEAKER/Environmental Ethics (Dr. Dan Vallero)/ Student Evaluations
<b>26</b>	<b>Nov-21 Evening</b>	<b>N/A</b>	<b>EXAM #3 (Classes 15-25)</b>

## Assignments:

- *Class Attendance and Participation:* Each student is expected to attend class, participate in lab sessions and field trips. Student discussion will be facilitated and is highly encouraged in class. If for any reason a student is unable to attend a lab session and/or field trip, arrangements should be made with the instructor and/or TA prior to that class period.
- *Group Laboratory Reports:* Each group should submit a report 2 weeks after the completion of a lab. These reports should include the following sections: title, author names, abstract, introduction, materials and methods, results, discussion and references. Each team member will be asked to rate the level of effort each team member contributed (i.e., % contribution of each team member to the laboratory exercise and final report). This rating should be provided by each individual by email directly to the TA separately from the lab report the same day the lab reports are due. This rating will be used to pro-rate each team members lab report grade. No late reports will be accepted unless prior arrangements have been made with the instructor.
- *Group Presentation:* Each week, one group will give a “chemical of the week” presentation. Each group will select a contaminant and discuss its environmental significance. Preference should be given to emerging contaminants. The instructor will guide you in your chemical selection. You should discuss your choice with the instructor at least one week prior to your presentation. Each presentation should describe the compound’s chemical characteristics, its environmental sources and toxicity. Each presentation should last no more than 10 minutes.
- *Exams:* There will be three evening exams held during the semester in addition to the final. All exams will be closed-notes and closed-book. The instructor will discuss the exam format prior to each exam date. No make-up exams will be given unless arrangements are made with the instructor prior to the exam date.
- *Homework:* Assignments will be posted on Blackboard every Thursday and should be turned in at the beginning of class on the following Thursday. No late homeworks will be accepted unless prior arrangements have been made with the instructor.