

# EES 4860/6860 Pollution Prevention and Industrial Ecology

## Fall 2013

Time: 12:30 - 1:45 Tuesday & Thursday  
Location: 121 Brackett Hall  
Instructor: Annick Anctil, Ph.D.  
Assistant Professor, Environmental Engineering and Earth Sciences  
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Location: Immediately after class or by appointment.

### Course Description

The late 20<sup>th</sup> century marked a paradigm shift in corporate environmental practices. Instead of treating environmental considerations as unavoidable costs occurring at the end of a process, companies began to strategically rethink environmental initiatives. Proactive environmental management opportunities include the practice of pollution prevention, industrial ecology, and design for the environment – concepts which dismiss end-of-pipe treatment as the primary option for industrial wastes. Instead, recent legislation and reconceived environmental strategies attempt to integrate environmental considerations in industrial systems by using a systems approach to manufacturing and examining the life cycles of products, incorporating total cost accounting, extended producer responsibility and design-for-end-of-life into decision making processes.

### Resources

The required text for this course is *Industrial Ecology and Sustainable Engineering* by TE Graedel and BR Allenby (2<sup>nd</sup> edition 2009). Additional readings and handouts will be posted periodically on Blackboard. It is recommended that you bring these materials in class in either electronic or paper format.

### Attendance

Attendance is not mandatory but much of the material you will need will only be provided during class, so attendance is highly recommended.

### Assignments

Homework will be assigned most Tuesday and will be due electronically by the beginning of class the following Tuesday. Homework content will include problem solving, reading assignments, written critiques of readings, etc. In addition to formal assignments, students are asked to pay attention to current topics in sustainability issues. Late homework will receive an automatic 10% deduction for every day overdue. The lowest homework grade will be dropped. Students enrolled in 686 will have additional questions to complete on each assignment.

### Group Project

A group project will be assigned during the semester. The group will give a short presentation at the end of the semester and will turn in a written document.

## Exams

Three exams will be given: two during the semester and a final. The final will be held during finals week, according to the University schedule. Each exam will have equal value and final exam will not be cumulative. Students enrolled in 686 will have more advanced exams than those in 486.

## Assessment Criteria

1. Homework 20%
2. Project 20%
3. Midterm (2) 40%
4. Final 20%

## Policy

- Attendance at regular scheduled class meetings is expected as well as participation in class discussions.
- In the event of an unplanned absence by the professor, class will be cancelled after 15 minutes
- Academic honesty is expected. Any violation of Clemson University policy as described in the Student Handbook will not be tolerated and may result in a failing grade.

## Tentative Course Outline (Subject to Change)

Date	Topic	Reading
Aug 22	Introduction	
Aug 27-29	Sustainability and Industrial Ecology	2-3
Sept 3 -5	Ecological analogies and models	4-5
Sept 10 -12	Industrial Symbiosis/ Circular Economy	16
Sept 17-19	Material Flows	17-18
<b>Sept 24</b>	<b>Midterm 1</b>	
Sept 26- Oct 3	Intro to LCA	12-13
Oct 8-10	Energy and Water	19-20
Oct 15-17	Resource use and scarcity	24
Oct 22-24	Pollution Prevention	8
Oct 29-31	Disassembly Lab – Design for X	11
Nov 5-7	Green Chemistry & Green Engineering	8
<b>Nov 12</b>	<b>Midterm 2</b>	
Nov 14 (football game)	GABI tutorial	
Nov 19-21	Social dimension of IE and Sustainable consumption	7
Nov 26	Systems Analysis and IE models	15-22
Dec 3-5	Final Presentations (Project due on Dec 5)	