

AIR POLLUTION CONTROL
ENGG*4330
FALL 2007

Instructor:

Warren Stiver, Ph.D., P.Eng.

Professor & NSERC Chair in Environmental Design Engineering

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WebCT too

Office Hours: Whenever I am in my office - my base schedule posted on my door
and on my website.

Meeting Times:

Lectures - MWF 12:30 - 1:20 MACK 225

Tutorial - Mon 1:30 - 3:20 CRSC 116

Teaching Assistant:

No GTA.

Text:

C.D. Cooper and F.C. Alley, **2002**, *Air Pollution Control: A Design Approach*, 3rd Ed.,
Waveland Press, Inc. Prospect Heights, IL.

Notes:

Copies of all lecture overheads will be available throughout the term. They may be purchased for \$5 (payable to Mary/Lucy in the main office). They will also be posted in batches on the course's WebCT site. Supplemental information will also be provided for download via WebCT.

Prerequisites:

ENGG*3260 Thermodynamics

ENGG*3180 Air Quality

Course Objectives:

Following completion of this course the students will understand techniques used to minimize the emission of air pollutants. These techniques include end-of-pipe solutions (e.g. electrostatic precipitators) and in process solutions (e.g. combustion chamber modifications). The understanding will include the underlying principles and the basics of design for each unit.

Evaluations:

- Lab Project: 30% (Report due: October 18th)
- Design Project: 30% (Report due: December 11th)
- Tests: 40% (Weeks 4, 6, 9, 11)
- Peer Evaluations: * (Multiplying factor for team reports)

Note: There is NO final exam. The design project is due during the exam period.

Laboratory Project:

Combustion system emissions and energy efficiency. A preliminary experiment will be conducted on Monday, September 10th (week 1). Full experiments will be scheduled between September 18th and September 27th in non-scheduled class times.

Design Project:

The design of a particulate pollutant control system. An innovative design idea developed and supported using CFD.

Team Work is a Requirement in this Course!

The laboratory and design projects will be conducted in teams of three and a single report will be submitted by each team. You are free to choose your team members. However, there must be no overlap between your two teams, I may need to assign some team members and there may be one or two teams of four.

You will be required to submit a peer evaluation form with the final reports (lab and design). Should this provide evidence or should there be other evidence that one or more members of the team may not have contributed their share of the effort then the instructor will arrange meetings with individuals involved. The result may be a multiplication factor of less than 1.0 assigned to one or more individuals. In some cases the lack of contribution may be considered academic misconduct. The University’s academic misconduct policies and procedures will then apply.

Assignments:

Assignments will be provided. The value in completing the assignment yourself will be for your learning. You are responsible for the material that is reflected by these assignments. Tutorials will be used for providing assistance in the completion of these assignments. Questions from old exams will make up some of the assignments.

Tour:

A tour of the University of Guelph’s Utility Boilers will hopefully be conducted.

Policies:

- Missed labs, design projects and/or tests will require documented medical or compassionate evidence. The sniffles the day before a project is due is not grounds for consideration of late submissions.
- Late design and lab reports will be assigned a grade of zero (0) for all members of the team.

- A failing grade will be assessed when a solution is fundamentally flawed.
- **Literacy and Numeracy Expectations:**
It is required that the students perform with a reasonable competency in both numeracy and literacy. Failing grades **WILL** be assigned on entire questions or projects (or substantial portions thereof) if the competency is inadequate at the 4th year level.
- **Academic Integrity:**
Team Lab and Team Design projects must include a cover page of the required format. Students who have not signed the cover page will NOT receive the grade assessed for the report. The University's academic misconduct policies will be applied, as described in the Calendar, when it becomes known that a student(s) has committed academic misconduct including claiming credit for work that they have not substantively contributed to.

Topic Outline (nominal # of lectures):	Suggested Reading*
Introduction (1)	
■ air issues	
Combustion (10)	Supplemental Notes
■ fundamentals	
■ role in pollution formation and control	Ch 15 C&A
■ automobiles	Ch 17 C&A
Particulate matter control (8)	
■ particulate characteristics	Ch 3 C&A
■ cyclones	Ch 4 C&A
■ electrostatic precipitators	Ch 5 C&A
■ fabric filters	Ch 6 C&A
Fugitive Emissions (4)	
● Characterizing	
● Control	
Closure (1)	
* it would be greatly to your advantage to read these chapters prior to the corresponding lecture coverage	

Comments:

All students are encouraged to submit signed written comments (positive or negative) to the Director of the School of Engineering on any aspect of this course.

