

Chm 180-Pollution Prevention, Green Chemistry, and Green Engineering
Winter 2009, Thursdays from 2:30PM - 5:10PM (MAK, D1129)

Professor: J. Krikke
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Office Hours: Tuesday 9:00-10:00 am, Wednesday 2:00-3:00 in Fuel (Lower Commons) or e-mail me to make an appointment.

Course Requirements:

- Text:

Objectives: Chemistry 180 is intended to provide the student with an overview of the fundamentals of pollution prevention, green chemistry and green engineering. The student should gain a greater appreciation of how improvements and modifications are being made in both research and manufacturing to maintain and even enhance environmental quality. It may also assist students in choosing a professional career.

Materials for Class: Will be posted on Blackboard prior to beginning a new unit.

Evaluation: Web and literature searches connected to the unit will be assigned, after which a short paper or presentation will be given by the student. Students will also be assessed on how they participate in group discussions and if they ask questions of invited guest speakers and participate actively on field trips.

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| ▪ Web/literature searches and papers | 15 % of grade |
| ▪ Participation and questions | 5 % of grade |
| ▪ 2 or 3 unit presentations | 40 % of grade |
| ▪ Final Presentation (in place of final exam) | 40% of grade |

A course letter grade will be based on the following percentages:

A.....100-94%	A-.....93-90%	
B+.....89-87%	B..... 86-83%	B-.....82-80%
C+.....79-77%	C..... 76-73%	C-.....72-70%
D+.....69-67%	D..... 66-60%	
	F..... 59% or below	

Special Needs: Students with special needs due to learning or physical disabilities should contact Disability Support Services (DSS) at 331-2490. That office will contact me to confirm any special needs you may have, but it is your responsibility to speak to me ahead of time if special arrangements need to be made for you to take trips or make presentations.

Class Dates and Tentative Topics

January 08	Unit 1 - Introduction to concepts of class. <u>Guest speaker</u> , Clinton Boyd from the Sustainability Research Group.
January 15	Unit 1 - Properties and fates of environmental contaminants - types of compounds and where they end up
January 22	Unit 2 - Humans - Industrial activity and the environment. Discussion about types of pollutants produced by humans. <u>Guest Speaker</u> , Dr. Berkley Cue with a Pfizer Case Study.
January 29	Unit 2 - Improving manufacturing through green alternatives. <u>Guest Speaker</u> , Dr. David Shonnard from Michigan Technological University
February 05	Unit 2 - Economic perspectives on pollution prevention and minimization.
February 12	Unit 2 - Sustainability and recycling. <u>Tour</u> of Resource Recovery Service Center in Grand Haven.
February 19	Unit 3 - Water - Sources of water pollution, types of contaminants, and drinking water treatment.
February 26	Unit 3 - Treatment techniques. <u>Tour</u> of Wyoming Clean Water Plant
March 05	No class - Spring Break
March 12	Unit 4 - Air - Sources of air pollution, acidic aerosols, and the ozone hole
March 19	Unit 4 - Climate change and global warming.
March 26	Unit 5 - Energy -Types of energy sources and their environmental impact.
April 02	Unit 5 - Treatment of energy production waste and alternative energy sources. <u>Tour</u> of Zeeland Power Plant.
April 09	Unit 6 - Agriculture - Pollution from fertilizers and pesticides. Impact on nature (wildlife and food supplies).
April 16	Unit 6 - Green alternatives for fertilization and pest control.



This course is part of GVSU's General Education Program.

The goal of the program is to prepare you for intelligent participation in public dialogues that consider the issues of humane living and responsible action in local, national, and global communities.

The program is designed to increase your knowledge and skills in the following areas:

Knowledge Goals

1. The major areas of human investigation and accomplishment - the arts, the humanities, the mathematical sciences, the natural sciences, and the social sciences.
2. An understanding of one's own culture and the cultures of others.
3. The tradition of humane inquiry that informs moral and ethical choices.

Skills goals

1. To engage in articulate expression through effective writing
2. To engage in articulate expression through effective speaking.
3. To think critically and creatively.
4. To locate, evaluate, and use information effectively.
5. To integrate different areas of knowledge and view ideas from multiple perspectives.

Ensuring that undergraduate students receive a broad general education has been a primary goal of colleges and universities since their inception. In this era of increasing specialization and growing demand for professional expertise, it is vital that we continue to emphasize the value of general learning.

GVSU maintains that a complete education involves more than preparation for a particular career. A career occurs in the context of a life, and a sound general education helps one "make a life" as well as "make a living." The university is committed to assuring that all undergraduate students, regardless of academic major, receive a broad education rooted in the arts and sciences.

Teaching in the liberal tradition is at the heart of Grand Valley's identity, and this focus is critical in our General Education Program. Liberal education transcends the acquisition of information; it goes beyond the factual to ask important evaluative and philosophical questions. Liberal learning holds the fundamental principles and suppositions of a body of knowledge up to inquiry, question, and discussion. It helps a person recognize the assumptions under which he or she operates and encourages the examination and questioning of those assumptions. Liberal learning begins in the General Education Program and continues through the more specialized studies comprising each student's major and minor areas of study.

Grand Valley State University educates students to shape their lives, their professions, and their societies.