

Chemistry 471-671: Introduction to Green Chemistry Fall 2009 Syllabus

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Human society is facing environmental issues and problems of air, soil and water pollution arising from the development of industrial processes. This course probes aspects of chemistry which are designed to benefit society and which search for pathways to minimize the environmental impact of human industry and technology.

The grading standards for the course will vary depending on whether the student is enrolled in Chem 471 or 671.

For the undergraduate students in Chem 471:	
problem sets and analyses of primary literature	50%*
cumulative final exam	50%

For the graduate students enrolled in 671:	
problem sets and analyses of primary literature	40%*
cumulative final exam	30%
one 20 minute presentation	30%

* - the manner of assigning these points may vary between Professors

Textbooks:

Due to the multidisciplinary nature of Green Chemistry, there is no required textbook for this course. Students who wish to review some fundamental aspects of environmental chemistry are directed to, "Chemistry in Context: Applying Chemistry to Society," Fourth Edition, 2003, by Stanitski, Eubanks, Middlecamp and Pienta, published by McGraw Hill. Recommended reading includes: "Environmental Chemistry: 3rd Edition," by Baird and Cann, 2005, W.H. Freeman; "Green Chemistry : Theory and Practice," by Anastas and Warner, 2000, Oxford University Press; "Green chemistry : An Introductory Text," by Lancaster, 2002, The Royal Society of Chemistry; and "Green Chemistry : Challenging Perspectives," edited by Tundo and Anastas, 2000, Oxford University Press . All of these supplemental texts will be held on reserve in the library.

Topics and Schedule:

The following page presents an outline of the course topics for this semester. In addition to attending class and weekly discussion sections, students will be expected to read assigned handouts, to acquire and read primary literature from the holdings of Healey Library, and to be prepared to analyze and discuss those readings.

Section 504 of the Americans with Disabilities Act of 1990 offers guidelines for curriculum modifications and adaptations for students with documented disabilities. If applicable, students may obtain adaptation recommendations from the Ross Center for Disability Services, M-1-401, (617-287-7430). The student must present these recommendations and discuss them with each professor within a reasonable period, preferably by the end of Drop/Add period.

Students are required to adhere to the University Policy on Academic Standards and Cheating, to the University Statement on Plagiarism and the Documentation of Written Work, and to the Code of Student Conduct as delineated in the catalog of Undergraduate Programs, pp. 44-45, and 48-52. The Code is available online at: http://www.umb.edu/student_services/student_rights/code_conduct.html.

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Fall 2009 Topics Listing

Week Topic (Instructor)

Week 1: Green Chemistry, an Overview (Dransfield)

Weeks 2-4: The Chemistry of the Atmosphere (Dransfield)

2: The structure of the atmosphere, tropospheric chemistry

3: Stratospheric chemistry, the "Ozone Hole"

4: The Greenhouse Effect, climate change

Weeks 5-7: Pragmatic Considerations of Alternative Energy (Evans)

5: Biomass production

6: The hydrogen economy

7: Nuclear, solar, wind and geothermal

Weeks 8-10: Green Synthetic Methods (Zhang)

8: Catalytic methods

9: Alternative reaction media and energy

10: Atom economy reactions and recovery techniques

Weeks 11-14: Specific Topics in Green Chemistry and Graduate Student Presentations

Topics, speakers and readings to be announced