CHE 310-H/ENV 320-H/CHE 591
Chemistry in Technology and the Environment/Chemistry for Environmental Scientists
Fall 2013

Instructor
Dr. Katherine B. Aubrecht; Chemistry 407; (631) 632-7901;
katherine.aubrecht@stonybrook.edu

Meeting Times
Class meets Tu Th 2:30-3:50p in Frey Hall 105

Office Hours
Mon 3-4p
Tues 9-11a
Thurs 10a-noon
and by appointment

Course Description
This course focuses the chemistry of environmental processes, environmental degradation, remediation and abatement processes, energy production and some connections between chemistry-related and non-chemistry-related aspects of sustainability.

Course Objectives
● Students will be able to explain major processes in the chemistry of:
  environmental degradation, remediation and abatement efforts, and energy production
● Students will be able to describe how economists analyze the relationship between the economy and the natural environment
● Students will be able to describe the process of risk assessment in setting environmental policy
● Students will be able to critically evaluate chemistry and sustainability-related literature for general audiences
● Students will be able to work effectively in groups to learn content and solve problems.

Prerequisite
CHE 132, CHE 142, or CHE 152

DEC
CHE 310/ENV 320 is a DEC H (implications of science and technology) course

Texts

One book from the following list:


Assignments
Reading assignments from the textbook, journal articles, or other sources will be given each class and posted on Blackboard. It is expected that students will have completed all assigned reading before it is discussed in class. A significant amount of class time will be spent working in small groups to understand and apply the course content and develop process skills. You are expected to attend class and work with your group. There will be seven online problem sets over the course of the semester. You will be asked to write a critical review (5-7 pages) of one of the books suggested (Davis, MacKay, McDonough, Meadows, Shostak, or Steingraber) or, with permission of the instructor, another book written for general audiences that addresses an issue related to sustainability that has a chemistry-related aspect. Late assignments will be assessed a point penalty.

Electronic Resources
A course webpage is maintained on Blackboard (http://blackboard.stonybrook.edu/). Assignments, solutions to assigned problems and exams, and links to other resources are posted on it. Problem sets will be available on Blackboard at least 2 weeks before they are due. Writing assignments are to be submitted through Blackboard using Safe Assign xx.

Exam Schedule
Midterm Exam: Thurs Oct 17 in class
Final Exam: Mon Dec 16, 11:15a-1:45p

Evaluation
Course grades will be based on the percentage of points earned out of 500 possible points, distributed as:
- Participation 75
- Writing assignment 100
- Problem sets 75
- Mid-term exam 100
**Absences**

You are expected to attend all class sessions. If class sessions are missed for medical or religious reasons, you must provide documentation in order to not have your participation grade penalized. There is no make-up exam for the midterm during the semester. At the time of the final, there is the opportunity to answer additional questions. These additional questions constitute a make-up midterm. This option is only available to students who have presented a legitimate reason for missing the midterm within two weeks of the date of the midterm. If you are unable to take the final exam due to illness or other extenuating circumstances, you must contact the instructor within 24 hours and present acceptable documentation within one week.

**Academic Integrity**

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person’s work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at http://www.stonybrook.edu/uaa/academicjudiciary/.

**Cell Phones and Electronic Devices**

During regular class sessions, cell phones must be either in ‘vibrate mode’ or turned off. Calls cannot be answered. Text messaging is not allowed during class. Cell phones must be **turned off** and **enclosed** in a case, book bag, briefcase, or like during quizzes and exams. YOU are responsible for ensuring this policy is followed. Students MAY NOT have cell phones, electronic dictionaries, calculators, or other “information rich” devices (anything that can receive and/or store many pages of text) in their possession during quizzes and exams. Calculators used during quizzes and exams must be non-programmable.

**Disabilities**

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, Room 128, (631) 632-6748. DSS will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services.

**Critical Incident Management**

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach compromises the safety of the learning environment, or inhibits students' ability to learn.
# Course Outline

<table>
<thead>
<tr>
<th>Week of</th>
<th>Topic</th>
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<tbody>
<tr>
<td>8/26</td>
<td>sustainability, systems approach, green chemistry</td>
</tr>
<tr>
<td>9/2</td>
<td>no class 9/3 (Labor Day), atmospheric chemistry: ground level air pollution</td>
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<tr>
<td>9/9</td>
<td>atmospheric chemistry: ground level air pollution</td>
</tr>
<tr>
<td>9/16</td>
<td>atmospheric chemistry: stratospheric ozone layer</td>
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<tr>
<td>9/23</td>
<td>atmospheric chemistry: enhanced greenhouse effect</td>
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<tr>
<td>9/30</td>
<td>environmental economic models (Dr. Cassidy)</td>
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<tr>
<td>10/7</td>
<td>energy: fossil fuels, biofuels</td>
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<tr>
<td>10/14</td>
<td>energy: nuclear; <strong>midterm exam Oct 17</strong></td>
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<tr>
<td>10/21</td>
<td>energy: nuclear, solar</td>
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<tr>
<td>10/28</td>
<td>water: chemistry of natural waters- acid- base properties, acid rain, ocean acidification</td>
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<tr>
<td>11/4</td>
<td>water: chemistry of natural waters-redox</td>
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<td>11/11</td>
<td>water: drinking water treatment</td>
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<tr>
<td>11/18</td>
<td>risk assessment (Dr. Quigley)</td>
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<tr>
<td>11/25</td>
<td>soil: composition, nitrogen cycle, no class 11/18 (Thanksgiving)</td>
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<tr>
<td>12/2</td>
<td>major inorganic and organic pollutants</td>
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