Instructor Information
Instructor: Steven Bennett
Telephone Number: (443) 752-2822 (cell, use judiciously)
Email Address: sbenne27@jhu.edu
Office Hours: by appointment via FaceTime, Adobe Connect, or telephone

Course Description:
Course Description: This course provides students with a basic understanding of the fundamentals of chemistry of Earth’s interrelated chemical systems, and of how to manipulate and interpret chemical data. Topics include molecules and chemical bonding, states of matter, thermodynamics, and kinetics. Through a series of exercises, students apply chemistry principles to solve real-world environmental problems.

Prerequisite: Students are urged to take 420.301 Quantitative Methods for Environmental Sciences before enrolling in this course. Offered online only, one to two times annually.

Course Goals: By the end of this course, you will be able to:
1. Describe the states of matter, pure substances, mixtures, atoms and molecules.
2. Interpret the interaction of matter with other matter and/or electromagnetic energy.
3. Distinguish between and describe physical mixtures and chemical reactions.
4. Identify the features and trends of the periodic table.
5. Write and interpret chemical formulas, determine molecular mass and balance chemical equations.
6. Interpret atomic structure and molecular structure.
7. Explain the greenhouse effect and describe the planetary systems that impact climate change.
8. Distinguish between potential energy, kinetic energy, entropy and the second law of thermodynamics.
9. Describe what happens when an ionic or covalent substance dissolves in water.
10. Express and relate concentration of a substance in a variety of units.
11. Describe and categorize acids and bases.
12. Explain the process(es) of alternative energy and its role in energy production.
13. Describe the process of the transfer of electrons.
14. Discuss the implications of the hydrogen economy energy generation and transportation.
15. Outline United States chemical policy and provide an overview of the Toxic Substances Control Act.
16. Summarize the principles of green chemistry and sustainability.
Course Materials:
Required Texts:
- *Chemistry in Context*, 9<sup>th</sup> Edition (or 8<sup>th</sup> Edition), by the American Chemical Society

Specific Technology Requirements:
- Access to a computer (mobile devices *may* work) and the Internet
- Head phone/microphone set
- Recommended Browsers: Chrome and Firefox for PCs. Safari for Mac computers.
- Updated JAVA. Adobe Flash Player system plug-in.

Technological Skills requirements:
- Ability to work with computers
- Navigate in and use Blackboard, the Blackboard Student Orientation course on your “My Institution” page
- Create and save MS Word documents; see MS Word training and tutorials for PC users (all versions); Word Help for Mac users
- Send e-mails, upload and download files, use browsers and Internet
- Participate on the Discussion Board and chats sessions.
- Use the Internet and JHU Library Electronic Resources for research.

Overview of Assignments (additional detail and rubric in Assignment Guidelines)

Chapter Questions: Each chapter will have selected questions to enhance your learning experience. The questions will NOT be collected but will be featured prominently in weekly quizzes and exams.

Weekly Quizzes: There will be weekly quizzes which will be open-note and you will have 1 hour to complete. The content will primarily be from the chapter questions (completion of chapter questions beforehand is strongly encouraged). The quizzes will be a combination of short answer, fill-in-the-blank and multiple-choice questions.

Online Discussions: Each module will have 2-3 Discussion Forum questions to address. You are expected to answer or contribute meaningfully to the discussions, as well as, respond to others student’s questions and/or responses. Generally, the questions will be open-ended and meant to invoke multiple pathways of discussion. It is highly recommended that you participate in the discussions on multiple occasions as it is the exchange within discussions that fosters effective learning.

Exams: The exams will be comprehensive, open-notes/textbook but will require that you work on your own. There will be an exam period of one week and you will choose a 24-hour period in which to complete the exam.

Review Paper: There will be a short paper review of a recent chemistry journal article. The paper should be 3-5 pages long and will be due the next to last week of class. There will also be a selected journal article for each chapter highlighting the breadth, pertinence and richness of chemistry and its various impacts on the environment.
**Tentative Course Schedule:** The instructor reserves the right to modify by adding or deleting the learning materials to help learners achieve the goals of the course. To facilitate student success, the instructor reserves the right to modify the due dates or add/delete assignments. You will be informed through Blackboard Announcements if there is a change.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Activities</th>
<th>Assessments &amp; Week they are due</th>
</tr>
</thead>
</table>
| 1    | Module 1: Portable Electronics: The Periodic Table in the Palm of Your Hand | Read Chapter 1  
Listen to lecture  
Problems: 4, 6, 8, 28, 38  
*(6th Ed.: 19, 1, 13, 1, 15, contact me for questions 28 & 38)*  
Learn elements 1-36 (H-Kr) | Week ending January 14  
Discussion Forum (ungraded)  
Complete Quiz 1 |
| 2    | Module 2: The Air We Breathe | Read Chapter 2  
Listen to lecture  
Problems: 2, 4, 13, 33, 40, 45  
*(6th Ed.: 3, 6, 21, 38, 46, 51)*  
Discussion Forum  
Complete Quiz 2 |
| 3    | Module 3: Radiation from the Sun | Read Chapter 3  
Listen to lecture  
Problems: 5, 8, 14, 16, 33, 46, 48, 60  
*(6th Ed.: 6, 9, 17, 18, 34, 44, 48, 49)*  
Discussion Forum  
Complete Quiz 3 |
| 4    | Module 4: Climate Change, part 1 | Read Chapter 4  
Listen to lecture  
Problems: 7, 18, 22, 28, 39  
*(6th Ed.: 7, 2.11, 18, 22, 39)*  
Read “Climate variability during the last 1000 years inferred from Andean ice cores: a review of methodology and recent results”, *Palaeogeography, Palaeoclimatology, Palaeoecology*, 2009, 281, 229-241. | Week ending February 4  
Discussion Forum  
Complete Quiz 4 |
| 5    | Module 5: Climate Change part 2 | Listen to lecture  
Problems: 44, 45, 50, 52  
*(6th Ed.: 45, 46, 52, 54)* | Week ending February 11  
Discussion Forum  
Complete Quiz 5 |
| 6    | Module 6: Energy from Combustion part 1 | Read Chapter 5  
Listen to lecture  
Problems: 6, 17, 19, 33, 48, 55  
*(6th Ed.: 6, 17, 19, 33, 48, 55)*  
Discussion Forum  
Complete Quiz 6 |
| 7    | Module 7: Energy from Combustion part 2 | Listen to lecture  
Complete Exam 1 |
| 8    | Module 8: Energy from Alternative Sources, part 1 | Read Chapter 6 *(6th Ed.: Chapter 7)*  
Listen to lecture  
Problems: 4, 12, 19, 30, 34, 44  
*(6th Ed.: 7.4, 7.11, 7.19, 7.30, 7.35, 7.57)*  
Read “Finessing the fuel: Revisiting the challenge of radioactive waste disposal”, *Energy Policy*, 2009, 709-714. | Week ending March 4  
Discussion Forum  
Complete Quiz 7 |
<table>
<thead>
<tr>
<th>Week</th>
<th>Module</th>
<th>Syllabus</th>
</tr>
</thead>
</table>
| 9    | Module 9: Energy from Alternative Sources, part 2 | Read *(8th Ed.: Chapter 8.7 & 8.8)*  
Listen to lecture  
Problems: 46, 47, 49  
*(8th Ed.)* 8.53, contact me for questions 47 & 49  
Week ending March 11  
Discussion Forum  
Complete Quiz 8 |
| 10   | Module 10: US Chemical Policy, TSCA and Green Chemistry | Read Chemicals Without Harm, Ch 7-9 by Gelser  
Read A primer on the new Toxic Substances Control Act (TSCA) and what led to it, by Richard Denison  
Listen to lecture  
Week ending March 18  
Discussion Forum |
| 11   | Module 11: Energy Storage part 1 | Read Chapter 7 *(8th Ed.: Chapter 8)*  
Listen to lecture  
Problems: 6, 9, 18, 21, 33  
*(8th Ed.)* 8.6, 8.9, 8.17, 8.20, 8.35  
Week ending April 1  
Discussion Forum  
Complete Quiz 9 |
| 12   | Module 12: Energy Storage part 2 | Listen to lecture  
Problems: 41, 50, 52  
*(8th Ed.)* 8.42, 8.51, 8.52  
Week ending April 8  
Discussion Forum  
Complete Quiz 10 |
| 13   | Module 13: Water Everywhere: A Most Precious Resource, part 1 | Read Chapter 8 *(8th Ed: Chapter 5 & 6..6.6, 6.13)*  
Listen to lecture  
Problems: 8, 12, 17, 33, 50, 55, 59  
*(8th Ed.)* 5.8, 5.10, 5.15, 5.28, 5.41, 5.46, 5.50  
Week ending April 15  
Discussion Forum  
Complete Quiz 11 |
| 14   | Module 14: Water Everywhere: A Most Precious Resource, part 2 | Listen to lecture  
Problems: 27, 36, 54, 58, 63,  
*(8th Ed.: 7.12, 7.14 contact me for questions 54, 58 & 63)*  
Week ending April 22  
Review Paper |
| 15   | Exam Week | Week ending April 29  
Complete Exam 2 |
Grading Key (see additional details and rubric in Assignment Guidelines)

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Point value x Number of assignments</th>
<th>Points Possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module Quizzes (11)</td>
<td>20 x 10 (low score dropped)</td>
<td>200</td>
</tr>
<tr>
<td>Exams (2)</td>
<td>100 x 2</td>
<td>200</td>
</tr>
<tr>
<td>Review Paper</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Discussion Forum (11, 1st week ungraded)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Individual Contribution – Posting due by Wednesday of each week</td>
<td>20 x 10</td>
<td>200</td>
</tr>
<tr>
<td>B. Minimum of two peer responses due by the end of the week</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Points for the course</strong></td>
<td></td>
<td><strong>700</strong></td>
</tr>
</tbody>
</table>

Grading

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Percentage</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>98% to 100%</td>
<td>686 – 700</td>
</tr>
<tr>
<td>A</td>
<td>94% and less than 98%</td>
<td>658 – 685</td>
</tr>
<tr>
<td>A-</td>
<td>90% and less than 94%</td>
<td>630 – 657</td>
</tr>
<tr>
<td>B+</td>
<td>88% and less than 90%</td>
<td>616 – 629</td>
</tr>
<tr>
<td>B</td>
<td>84% and less than 88%</td>
<td>588 – 615</td>
</tr>
<tr>
<td>B-</td>
<td>80% and less than 84%</td>
<td>560 – 587</td>
</tr>
<tr>
<td>C</td>
<td>70% and less than 80%</td>
<td>490 – 559</td>
</tr>
<tr>
<td>F</td>
<td>0% and less than 70%</td>
<td>Less than 490</td>
</tr>
</tbody>
</table>
Course Policies

E-mail Messages
When you send an e-mail message to the instructor or to another participant in the course, please observe the following guidelines:

- Include the title of the course in the subject field (e.g., JHU Chem 302).
- Keep messages concise, and check spelling and grammar.
- Send longer messages as attachments.
- Sign your full name (the sender's email is not always obvious).

Network Etiquette (i.e. "Netiquette")
The Netiquette "Core Rules" linked below are a set of general guidelines for cyberspace behavior. They probably won't cover all situations, but they should give you some basic principles to use in communicating online. For Netiquette Core Rules visit The Core Rules of Netiquette web page.

University Policies
This course adheres to all University policies described in the academic catalog. A few to pay close attention to are noted below.

Students with Disabilities
Johns Hopkins University is committed to providing reasonable and appropriate accommodations to students with disabilities. Students with documented disabilities should contact the coordinator listed on the Disability Accommodations page. Further information and a link to the Student Request for Accommodation form can also be found on the Disability Accommodations page.

Ethics & Plagiarism
JHU Ethics Statement: The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition. Report any violations you witness to the instructor. Read and adhere to JHU’s Notice on Plagiarism. Dropping the Course You are responsible for understanding the university’s policies and procedures regarding withdrawing from courses found in the current catalog. You should be aware of the current deadlines according to the Academic Calendar.

Getting Help
You have a variety of methods to get help. Please consult the help listed in the "Blackboard Help" link in the online classroom for important information. If you encounter technical difficulty in completing or submitting any online assessment, please immediately contact the designated help desk listed on the AAP online support page. Also, contact your instructor at the email address listed atop this syllabus.
Copyright Policy
All course materials are the property of JHU and are to be used for the student's individual academic purpose only. Any dissemination, copying, reproducing, modification, displaying, or transmitting of any course material content for any other purpose is prohibited, will be considered misconduct under the JHU Copyright Compliance Policy, and may be cause for disciplinary action. In addition, encouraging academic dishonesty or cheating by distributing information about course materials or assignments which would give an unfair advantage to others may violate AAP’s Code of Conduct and the University’s Student Conduct Code. Specifically, recordings, course materials, and lecture notes may not be exchanged or distributed for commercial purposes, for compensation, or for any purpose other than use by students enrolled in the class. Other distributions of such materials by students may be deemed to violate the above University policies and be subject to disciplinary action.

Code of Conduct
To better support all students, the Johns Hopkins University non-academic Student Conduct Code has been integrated and updated to include all divisions of the University. In addition, it is important to note that all AAP students are still accountable for the Code of Conduct for Advanced Academic Programs.

Title IX
Confidentiality and Mandatory Reporting
As an instructor, one of my responsibilities is to help create a safe and inclusive learning environment on our campus. I also have mandatory reporting responsibilities related to my role as a Responsible Employee under the Sexual Misconduct Policy & Procedures (which prohibits sexual harassment, sexual assault, relationship violence and stalking), as well as the General Anti-Harassment Policy (which prohibits all types of protected status based discrimination and harassment). It is my goal that you feel able to share information related to your life experiences in classroom discussions, in your written work, and in our one-on-one meetings. I will seek to keep information you share private to the greatest extent possible. However, I am required to share information that I learn of regarding sexual misconduct, as well as protected status based harassment and discrimination, with the Office of Institutional Equity (OIE). For a list of individuals/offices who can speak with you confidentially, please see Appendix B of the JHU Sexual Misconduct Policies and Laws.

For more information on both policies mentioned above, please see: JHU Relevant Policies, Codes, Statements and Principles. Please also note that certain faculty and other University community members also have a duty as a designated Campus Safety Authority under the Clery Act to notify campus security of certain crimes, as well as a duty under State law and University policy to report suspected child abuse and/or neglect.
Time Management Expectations

*What is the time demand and schedule of the course?* There are numerous readings (some highly technical) and assignments with a fairly regimented schedule and you are urged to plan accordingly. It is expected that you look ahead to schedule your time. Plan to complete coursework across several days of the week rather than all in one day. You should also be considerate of others as their ability to respond may precluded by your lack of activity. Be sure to consider how group activities impact your schedule as well.

Some assignments require that you work on them for multiple weeks. Be sure to review the assignment directions at the beginning of the course so that you can plan your time accordingly. Please seek help before becoming frustrated and spending a significant amount of time to resolve an issue.

*What if I have work commitment that conflicts or prevents completion of an assignment?* It is fully recognized that many, if not all, are working professionals and that work or personal situations will arise. Contact the instructor as soon as possible, ideally in advance, and reasonable accommodations will be granted.

*What if my computer crashes or the Internet goes down and prevents completion of an assignment?* It is fully recognized that this will happen. Contact the instructor as soon as possible and reasonable accommodations will be granted.
Assignment Guidelines

Chapter Questions
Each module will have selected questions to enhance your learning experience. The questions will NOT be collected but will reinforce concepts from the reading and lecture. They should also be excellent preparative exercises for weekly quizzes and exams. Answer keys for the chapter questions will be posted the Friday after the completion of the chapter.

Weekly Discussion Board Guidelines
All students are required to complete Discussion Board activities each week. Each module will have 2-3 online discussion questions to address. You are expected to answer or contribute meaningfully to the discussions, as well as, respond to others student’s questions and/or responses. Generally, the questions will be open-ended and meant to invoke multiple pathways of discussion. It is highly recommended that you participate in the discussions on multiple occasions as it is the exchange within discussions that fosters effective learning. The instructor will also be actively involved to encourage, probe and enhance the discussions.
There are 10 graded Discussion Boards for the semester and each week’s Discussion Board is worth 20 points for a total of 200 points. (the first week’s discussion is ungraded)
Individual postings are worth 10 points and the peer responses are worth 10 points. 200/700 points or 28.6% of the course grade are allocated for Discussion Boards.
Steps:
1. Individual posting ~200 words due by 11:59 PM on Wednesday. You will have to post your contribution before you can see your peers’ postings. Individual postings are worth 10 points.
2. Two Peer responses ~100 words each due by 11:59 PM on Sunday. You have to read and respond to at least two of your peers’ postings. A simple “I agree” or “Me too” is not acceptable. You have to bring in a fresh idea and enhance the discussion by adding your original ideas. Using ideas from the readings, you can project your insight on the topic. Peer responses are worth 5 points each.
3. Use examples in your individual postings as well as in your peer responses.
4. Late submissions will not receive any credit.
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Excellent 90-100%</th>
<th>Good 80-89%</th>
<th>Needs Improvement 70-79%</th>
<th>Unacceptable 69-0%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content Development</strong></td>
<td>Demonstrates ability to provide focused support; uses supporting evidence and appropriate examples. Presents ideas that help peers think and respond.</td>
<td>Provides support from the readings but use more specific evidence and examples.</td>
<td>The postings need to provide evidence from the readings. The learner needed to demonstrate ability to provide focused support.</td>
<td>The postings are not focused on the topic. They are late. There is no supporting evidence.</td>
</tr>
<tr>
<td><strong>Critical insight</strong></td>
<td>Refers to appropriate research and synthesize ideas. Demonstrates originality of thought.</td>
<td>Refers to sources but does not synthesize them. Needs to demonstrate originality of thinking.</td>
<td>Does not provide support from sources or present original ideas.</td>
<td>Has not read or thought about the topic under discussion.</td>
</tr>
<tr>
<td><strong>Quality of Peer Response</strong></td>
<td>Provides thoughtful peer responses and advances the argument in new directions. Provides original examples for support.</td>
<td>Peer responses needed to provide original thinking.</td>
<td>Responses just agree with the original postings and do not engage the peers’ points or take them further.</td>
<td>Peer responses are late and not related to the topic.</td>
</tr>
<tr>
<td><strong>Style of communication:</strong> word choice, grammar and punctuation</td>
<td>The postings observe correct grammar and punctuation rules. Address the peers with respect. Communication is clear.</td>
<td>Communication is mostly clear, but there are mistakes in grammar and punctuation.</td>
<td>Respectful tone of communication is necessary. All word choice, grammar and punctuation mistakes need to be revised.</td>
<td>Does not observe respectful etiquette of online communication. Numerous mistakes in grammar and punctuation.</td>
</tr>
<tr>
<td><strong>References and hyperlinks</strong></td>
<td>Included and correctly functioning</td>
<td>Included but improper/non-functioning hyperlinks</td>
<td>Not included</td>
<td>Not included</td>
</tr>
</tbody>
</table>
Module Quizzes

Due on each Monday by 11:59 PM, late submissions accepted but with 50% penalty. There are 10 quizzes for the semester, each week’s quiz is worth 20 points for a total of 200 points. If all module quizzes are completed, the lowest score will be dropped. 200/700 points or 28.6% of the course grade are allocated for quizzes. Length = 1 hour

Description of the Assignment: The content will primarily be from the chapter questions (completion of chapter questions beforehand is strongly encouraged).

Instructions: Complete quiz on Blackboard. Questions will be multiple-choice, fill-in-the-blank or short response/essay.

Required Citation Format: Functioning hyperlinks when applicable

Module Quizzes Rubric (short response or essay questions)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Excellent 90-100%</th>
<th>Good 80-89%</th>
<th>Needs Improvement 70-79%</th>
<th>Unacceptable 69-0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Development</td>
<td>Demonstrates ability to provide focused support; uses supporting evidence and appropriate examples.</td>
<td>Provides support from the readings but use more specific evidence and examples.</td>
<td>The learner needed to demonstrate ability to provide focused support.</td>
<td>The postings are not focused on the topic.</td>
</tr>
<tr>
<td>Calculations and analytical reasoning</td>
<td>Demonstrates correct answer with proper units, showing work and reasoning.</td>
<td>Provides work and reasoning but with incorrect final answer.</td>
<td>Provides correct response with units but no work or reasoning; provides correct response with incorrect units.</td>
<td>Incorrect response or no response.</td>
</tr>
<tr>
<td>Style of communication: word choice, grammar and punctuation</td>
<td>The postings observe correct grammar and punctuation rules. Address the peers with respect. Communication is clear.</td>
<td>Communication is mostly clear, but there are mistakes in grammar and punctuation.</td>
<td>Respectful tone of communication is necessary. All word choice, grammar and punctuation mistakes need to be revised.</td>
<td>Does not observe respectful etiquette of online communication. Numerous mistakes in grammar and punctuation.</td>
</tr>
</tbody>
</table>

Module Quizzes Rubric (multiple choice or fill-in-blank)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Excellent 100%</th>
<th>Unacceptable 0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correctness</td>
<td>Is correct</td>
<td>Incorrect</td>
</tr>
</tbody>
</table>
Exams

Due on assigned day by 11:59 PM
There are 2 exams for the semester, each exam is worth 100 points for a total of 200 points
200/700 points or 28.6% of the course grade are allocated for Exams.
Length = You will have 24 hours to complete exam from the time you download it from Blackboard. My expectation is that it will reasonably take you 2-4 hours to complete the exam. (and if you require 10 hours, you have it, but that is probably way too long)
The exams will be comprehensive, open-notes/textbook but will require that you work on your own.

Instructions: All work is expected to be your own although you can use external information provided you supply attribution (ideally embed hyperlinks into your final document). In some cases, external articles and links may assist greatly in bolstering your response. The majority of the questions touch upon essential concepts and you are expected to provide thought-provoking, cogent and coherent explanations. Please do so. Incoherent circular diatribes or responses resembling male bovine excrement will cause both you and me undue stress and aggravation.
Required Citation Format: Functioning hyperlinks when applicable

Rubric for Exams

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Excellent 90-100%</th>
<th>Good 80-89%</th>
<th>Needs Improvement 70-79%</th>
<th>Unacceptable 69-0%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content Development</strong></td>
<td>Demonstrates ability to provide focused support; uses supporting evidence and appropriate examples.</td>
<td>Provides support from the readings and lectures but use more specific evidence and examples.</td>
<td>The learner needed to demonstrate ability to provide focused support.</td>
<td>The responses are not focused on the topic. There is no supporting evidence.</td>
</tr>
<tr>
<td><strong>Critical insight</strong></td>
<td>Refers to appropriate research and synthesize ideas. Demonstrates originality of thought.</td>
<td>Refers to sources but does not synthesize them. Needs to demonstrate originality of thinking.</td>
<td>Does not provide support from sources or present original ideas.</td>
<td>Has not read or thought about the topic under discussion.</td>
</tr>
<tr>
<td><strong>Style of communication:</strong> word choice, grammar and punctuation</td>
<td>The postings observe correct grammar and punctuation rules. Address the peers with respect. Communication is clear.</td>
<td>Communication is mostly clear, but there are mistakes in grammar and punctuation.</td>
<td>Respectful tone of communication is necessary. All word choice, grammar and punctuation mistakes need to be revised.</td>
<td>Does not observe respectful etiquette of online communication. Numerous mistakes in grammar and punctuation.</td>
</tr>
<tr>
<td><strong>References and hyperlinks</strong></td>
<td>Included and correctly functioning</td>
<td>Included but improper/non-functioning hyperlinks</td>
<td></td>
<td>Not included</td>
</tr>
</tbody>
</table>
Review Paper

Due on next to last week of class by 11: 59 PM
The Review Paper is worth 100 points
100/700 points or 14.3% of the course grade.
Length = 3-5 pages

Description of the Assignment: There will be a short paper review of a recent chemistry journal article. There will also be a selected journal article for each chapter highlighting the breadth, pertinence and richness of chemistry and its various impacts on the environment.

Potential sources of articles
Electronic Journals section of online resources of JHU library: Complete JHU Online database
Use keywords of interest in:
• ACS Publications Search (American Chemical Society)
• Royal Society of Chemistry
• ScienceDirect
• SpringerLink
One particularly useful source of articles is the American Chemical Society journal, Environmental Science and Technology.

Other suggested journals
• Environmental Chemistry Letters
• Environmental Science and Pollution Research

Instructions: The review should include the following:
1) Article should be pre-approved to ensure pertinence and avoid duplication
2) Synopsis of article results and conclusions
3) State of contemporary research (2-3 additional articles on similar research)
4) Relevance of article to the Environmental Science and Policy or Energy Climate Change programs and an indication of why you chose article
5) What questions were raised during your review?

Required Citation Format: Clear, consistent referencing. Functioning hyperlinks when applicable
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Excellent 90-100%</th>
<th>Good 80-89%</th>
<th>Needs Improvement 70-79%</th>
<th>Unacceptable 69-0%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content Development</strong></td>
<td>Demonstrates ability to provide focused support; uses supporting evidence and appropriate examples.</td>
<td>Provides support from the article but use more specific evidence and examples.</td>
<td>The review need to provide evidence from the readings. The learner needed to demonstrate ability to provide focused support.</td>
<td>The review is not focused on the topic. They are late. There is no supporting evidence.</td>
</tr>
<tr>
<td><strong>Critical insight</strong></td>
<td>Refers to appropriate research and synthesize ideas. Demonstrates originality of thought.</td>
<td>Refers to sources but does not synthesize them. Needs to demonstrate originality of thinking.</td>
<td>Does not provide support from sources or present original ideas.</td>
<td>Has not read or thought about the article under discussion.</td>
</tr>
<tr>
<td><strong>Style of communication:</strong></td>
<td>The postings observe correct grammar and punctuation rules. Communication is clear.</td>
<td>Communication is mostly clear, but there are mistakes in grammar and punctuation.</td>
<td>All word choice, grammar and punctuation mistakes need to be revised.</td>
<td>Numerous mistakes in grammar and punctuation.</td>
</tr>
<tr>
<td><strong>word choice, grammar and</strong></td>
<td>Clear articulation of the connection between paper and course; selection basis and interest articulation.</td>
<td>Vague articulation of the connection between paper and course.</td>
<td>No indication of the connection between paper and course.</td>
<td></td>
</tr>
<tr>
<td><strong>punctuation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Connections to course and program</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Questions raised by article</strong></td>
<td>Articulate questions raised showing clear comprehension of article and research.</td>
<td>Vague questions raised showing incomplete understanding of article and research.</td>
<td>No questions included</td>
<td></td>
</tr>
<tr>
<td><strong>References and hyperlinks</strong></td>
<td>Included and correctly functioning</td>
<td>Included but improper/non-functioning hyperlinks</td>
<td>Not included</td>
<td></td>
</tr>
</tbody>
</table>