Chemistry 2210A Course Outline, Fall 2017
Chemistry of the Environment
Lectures: Monday, Wednesday, Friday 1:30pm, room 3M 3250

This document provides you with information pertaining to the course’s dates, requirements, evaluation, and policies.

Keep this document handy for future reference.

Mandatory Notice from the Registrar

Unless you have either the prerequisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites. The prerequisite for Chemistry 2210A is Chemistry 1301A and 1302B, or the former Chemistry 1100A and 1200B or Chemistry 1024A/B.

Accessibility

Please contact the course instructor if you require material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 ext. 82147 if you have questions regarding accommodation.

Course Website

Students should check OWL (http://owl.uwo.ca) and UWO email on a regular basis for news and updates. This is the primary method by which information will be distributed to all students in the course. Missing critical information due to your failure to check OWL or email UWO regularly cannot be used as a basis for appeal.

*follow us in twitter @WesternuChem
Support Services

Students are encouraged to make use of the free, study-skills courses and other services, including learning-skills counselling, provided by the Student Development Centre, http://www.sdc.uwo.ca.

The Office of the Registrar: http://www.registrar.uwo.ca

USC Services: http://westernusc.ca/services/

Students who are in emotional/mental distress should refer to Mental Health@Western http://www.health.uwo.ca/mental_health/ for a complete list of options about how to obtain help.
Instructor

Dr. Keith Griffiths, Chemistry room 25 (ground floor), griff@uwo.ca

If you email me, you must use your @uwo.ca email address and include Chem 2210A in the subject line. Messages from a non-Western account or those that do not include Chem 2210A may be blocked by the University’s anti-spam systems.

Email should only be used for administrative purposes and not for questions related to course material (such as how to do a particular question in the book). Questions related to course material should be posted on the OWL discussion board.

Code of Conduct

To foster a supportive and enriching academic environment that is conducive to learning and free inquiry, Western has a Student Code of Conduct (http://www.uwo.ca/univsec/board/code.pdf).

You can expect your instructor to promote this environment and also respect each student’s unique views and opinions. Since Western is also a part of your environment, it is not unreasonable to expect the same from you. Activities that disturb another student’s right to this environment will not be tolerated. These include talking in class about matters not relevant to class, using disruptive electronic devices, and not respecting others. Students who persist in such behavior will be required to leave the class.

You can also expect your instructor to come prepared, on time, and eager to teach. In turn, it is expected that you will come prepared, on time, and ready to learn.
Course Materials (from the Book Store)

Textbook (strongly recommended)
- Baird and Cann, *Environmental Chemistry*, 5th Edition (Freeman)
  The 4th edition of the text is suitable for most of the course material, and used copies are widely available. Copies of the 4th and 5th edition of the text and the Solutions Manuals are available on 2-hour reserve at the Taylor library. Note that the chapters have been renumbered from the 4th to 5th editions, so care must be taken if you are using the 4th edition.

Sharp EL-510R(B) or Sharp EL-510RN(B) scientific calculator
- These are the *only* models permitted during tests and exams (if needed) and is the same model that you used in first year. **All other models will be confiscated.** Proctors for tests and exams do not lend calculators, so it is your responsibility to bring the correct calculator and to ensure that it is in proper working order. The sharing or exchanging of calculators during tests or exams is strictly forbidden.
Evaluation

Components

The course grade, out of 100, will be calculated as listed below. Listed next to the respective components are their corresponding maximum values toward the course grade. You must achieve a grade of 50% or greater to pass the course. All tests will be counted.

<table>
<thead>
<tr>
<th>Component</th>
<th>Date</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>Midterm # 1*</td>
<td>Friday 6th October</td>
<td>20</td>
</tr>
<tr>
<td>Midterm # 2*</td>
<td>Friday 10th November</td>
<td>20</td>
</tr>
<tr>
<td>Participation**</td>
<td>Due by Friday December 1st</td>
<td>11</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Scheduled by the Registrar</td>
<td>49</td>
</tr>
</tbody>
</table>

*Both mid-term tests will be during the normal class time. The tests will be 45 mins in length. The rooms will be announced on OWL. There are no make-ups for these tests. If you miss test #1 due to documented illness etc, the weight will be added to test #2. If you miss test #2, the weight will be added to the final.

Test #1 will cover all material from the start of term, and up to the Friday before the test (approximately).

Test #2 will cover only the material covered in class between Wednesday October 4th, and Friday November 3rd (all of the above dates are approximate...I will let you know the exact coverage on OWL in BOTH cases)

The final is cumulative, but questions related to material covered in the two midterms will be taken from those tests.

All tests are multiple choice.
** Participation:

Participation marks are awarded through discussion on OWL forums. *Up to 5%* is awarded through the posting and commenting upon, an article or news story of relevance to the course material. Find an article or news story, post a link, and comment on the story that you have found. Marks will be awarded based on the relevance, significance and how contemporary your article is (up to 3%). Marks are also awarded for *your* initial comment on your own posting (up to 2%). A very brief statement such as ‘this is scary’ or ‘this sucks’ is not going to win you anything. You must show that you have read your article, understood the implications, and have made thoughtful comments that will provoke discussion.

The other 6% (= 3 x 2%) is gathered through insightful comments on articles that *others* have posted. Again, something like ‘Yeh, well I think that sucks too’ is going to get you nothing. You must comment on, or join in the discussion on at least 3 articles besides your own.

Last day to participate is Friday December 1st. Do not leave it until the last minute. If two people happen to post the same article, the person who got there first gets the credit (even if it’s only by a few seconds)

The idea here is to provoke thoughtful discussion, and to make sure that you all are reading the news about our environment.
Exam Policy

Students seeking academic accommodations based on medical (physical or mental) illness should begin by contacting the Academic Counsellors of their home faculty. Please visit the following link for policy on Accommodation for Illness: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following website: http://www.uwo.ca/univsec/handbook/appeals/scholoff.pdf. Computer-marked, multiple-choice tests and exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

Aside from the specified calculator, no other electronic devices (phones, iPods, etc.) are permitted on your desk or person during tests and exams, even for timekeeping purposes. No other paper, documents or aids are permitted during exams.

Missed Course Components

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or supporting documentation to the Academic Counselling Office of your home faculty as soon as possible.

If you are a science student, the Academic Counselling Office of the Faculty of Science is located in WSC 191, and can be contacted at 519-661-3040 or scibmsac@uwo.ca.
Their website is: http://www.uwo.ca/sci/undergrad/academic_counselling/index.html.

A student requiring academic accommodation due to illness must use the Student Medical Certificate (https://studentservices.uwo.ca/secure/medical_document.pdf) when visiting an off-campus medical facility. For further information, please consult the university's medical illness policy at: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf.

If you miss the Final Exam, contact your faculty's Academic Counselling Office as soon as possible. They will assess your eligibility to write the Special (or makeup) Exam.

You may also be eligible to write the Special Exam if you are in a “Multiple Exam Situation” (see http://www.registrar.uwo.ca/examinations/exam_schedule.html).
Equal Opportunity and Evaluation Policy

The university is committed to academic integrity and has high ethical and moral standards. All students will be treated equally and evaluated using the criteria presented in this course outline and their respective weights. The evaluation criteria are based strictly on actual achievement, not on effort or how hard the student tried. Claims of an excellent academic history, of attendance in the course components, or of personal issues (family, relationship, financial, etc.) cannot be used to justify a higher grade in course because they are not criteria for evaluation.

There is no extra work available for extra credit or to “make up” another grade. No extra assignments, essays, experiments, or other work of any kind is offered to any student.

The requirement for a higher grade in order to, for example, maintain a scholarship, enter a program, or obtain a higher GPA for various reasons, is not a justifiable reason for increasing your grade. If we increased or “bumped” your grade (i.e. gave you a grade that you did not legitimately earn), it would be unfair to the other students and also a great disservice to the scholarships and programs who are evaluating all students on the basis of their grades.
Course Objectives and Learning Outcomes

**Overall**: students will develop an appreciation of the impact of human activity on our environment, especially with respect to the use of chemicals and fossil fuels.

**Chapters 1 and 2**: understand how ozone is created and destroyed in the natural, unpolluted atmosphere. Understand how man-made chemicals interfere with natural processes to create ozone ‘holes’ and the impact of these on all living species.

**Chapters 3 and 4**: develop an appreciation of and understanding of the root causes and consequences of polluted air.

**Chapter 5**: understand the natural greenhouse effect and how the temperature of the planet is maintained in equilibrium. Understand the impact of human industrial activity and the contribution of carbon dioxide to global warming. Appreciate the difference between global warming and the ‘greenhouse effect’.

**Chapters 7 and 9**: understand the term ‘biofuels’ how they are created and the differences between biofuels and fossil fuels. Understand the basic mechanism of nuclear fission reactors and the problems associated with spent fuel.

**Chapters 10 and 11**: Understand the chemistry of natural and polluted water. Understand how water quality is impacted by human activity and how water is purified for human consumption.

**Soft Skills**: participation activities will provide students with an opportunity to become familiar with environmental issues outside of course topics, and be able to discuss and debate issues with their peers through discussion forums.
Anticipated Course Topics (subject to revision* and not necessarily in this order)

<table>
<thead>
<tr>
<th>Textbook Chapter</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Stratospheric Chemistry: The Ozone Layer</td>
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<tr>
<td>2</td>
<td>The Ozone Holes</td>
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<tr>
<td>3</td>
<td>The Chemistry of Ground-Level Air Pollution</td>
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<tr>
<td>4</td>
<td>The Environmental and Health Consequences of Polluted Air – Outdoors and Indoors</td>
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<tr>
<td>5</td>
<td>The Greenhouse Effect (up to Section 5.26)</td>
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<tr>
<td>6</td>
<td>Energy Use, Fossil Fuels, CO₂ Emissions and Global Climate Change (up to Section 6.26)</td>
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<tr>
<td>7</td>
<td>Biofuels and Other Alternative Fuels</td>
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<tr>
<td>8</td>
<td>Renewable Energy Technologies: Hydroelectric, Wind, Solar, Geothermal, Marine Energy and Their Storage (if time permits)</td>
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<tr>
<td>9</td>
<td>Radioactivity, Radon and Nuclear Energy</td>
</tr>
<tr>
<td>10</td>
<td>The Chemistry of Natural Waters</td>
</tr>
<tr>
<td>11</td>
<td>The Pollution and Purification of Water</td>
</tr>
</tbody>
</table>

*Although the topics listed above are the intended course topics, the instructor reserves the right to deviate from this list should an interesting topic of environmental concern appear in the news.

Anything that is covered in class or in an assigned reading is “testable”. If it is not covered in class, and it is not in any readings I may assign, it is not testable.