Environmental Science 1C03
Climate, Water and Environment
Course Outline
Summer 2018

Instructor
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GSB-202
Email: berniejm

Introduction

The primary aim of this course is to introduce you (the student) to the major environmental processes and how human activities impact them. We begin by an introduction to the principles of sustainability, and how science can be used to better understand how we interact with our environment.

We will discuss how Earth’s atmosphere functions, and its composition; Earth’s global energy balance, the role of climate processes, and how human activity has impacted them. Topics will include the greenhouse effect, the loss of the ozone layer, acid precipitation, urban heat islands, and global climate change.

We will see how our understanding of the hydrologic cycle and of global climate patterns can be used to better manage water resources. The discussion on the global atmospheric and oceanic circulations will be an opportunity to examine how remote areas can still be impacted by human activities occurring far away.

We will finally examine the role of ecosystems, and how they function. Topics will include the impact of biodiversity loss on ecosystems, soil erosion, water pollution and eutrophication, solid wastes disposal, sewage treatment, the management of hazardous chemicals and the path to a sustainable future for the global human population.

You will learn in this course by participating actively to lectures, by watching short video clips, by listening to weekly online modules and by completing weekly assignments. The course aims to balance the development of knowledge with that of personal transferable skills.

Please note that a complete and more detailed course outline is posted on Avenue to Learn for students registered in the course.
Course Materials


Both Mastering resources are required for this course. Information on how to access them will be described during the first lecture and will be posted on Avenue to Learn afterwards.

Lectures

Lectures will be on Monday and Wednesday, at 1:00 p.m. in LRW B1007. Check your lecture schedule attached for further details. ALL students are expected to attend ALL lectures. Partial lecture notes will be available on Avenue to Learn. It is the responsibility of the student to ensure that notes are obtained for any classes missed.

The live lectures will be supplemented by Online Modules that will be posted on Avenue to Learn (A2L). The material covered in these podcasts is just as important to your understanding of the course as the material covered during the live lectures. It is recommended that you watch these modules prior to attending the lectures to which they are associated.

The live lectures will be captured by Classroom Audio Visual Services (e.g. ECHO 360), and the link to the captures will be posted on Avenue to Learn.

Evaluation

This course will consist of online quizzes, assignments, a term project, iCliker in-class participation and a final exam. There will be 5 online quizzes in the course covering lecture and textbook material. Online assignments are valued at 5% each and the lowest assignment mark will be dropped. Mastering Quizzes will be available for a 4-day period. Their schedule will be posted on A2L. It is the responsibility of the student to be aware of quiz start and end dates, and of due dates for assignments. Please see the section titled ‘Missed Work or Late Work’ for information regarding missed quizzes.
This course will also contain a Final Exam. The final exam will cover all lecture, online modules, and textbook readings, as well as subjects covered by the assignments. The final exam will consist of calculations, definitions, and short answer questions.

Assignments (3 @ 7.5% each) 22.5%
Story Map Term Project 7.5%
Mastering Quizzes (best 4 of 5 @ 5% each) 20%
iClicker Participation 10%
Final Exam 40%

Assignments and Term Project

The course will contain four assignments. The topics are as follows:

Assignment 1: Radiation Budgets
Assignment 2: Acidification
Assignment 3 Water Balance

Each assignment and the Term Project will be accompanied by a tutorial delivered in class. The full tutorial notes for the tutorials will be released on Avenue to Learn afterwards. **It is your responsibility to read these tutorial notes.**

Active Participation during Lectures using iClicker

We will be using iClicker during lectures. Clicker questions are part of every lecture, so bring your clicker to class every day. **If you have registered your i-Clicker and you click a response to at least 80% of clicker polls during the term, you will receive the full 10% clicker grade.**

If you respond to less than 80% of possible polls, your clicker grade is pro-rated, in the following manner:

<table>
<thead>
<tr>
<th>% of polls participated to</th>
<th>Participation Mark %</th>
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</thead>
<tbody>
<tr>
<td>80 or more</td>
<td>10 (full %)</td>
</tr>
<tr>
<td>75 to 79</td>
<td>9</td>
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<tr>
<td>70 to 74</td>
<td>8</td>
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<td>60 to 69</td>
<td>7</td>
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<td>50 to 59</td>
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<td>40 to 49</td>
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<td>30 to 39</td>
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<td>20 to 29</td>
<td>3</td>
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<td>10 to 19</td>
<td>2</td>
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<tr>
<td>1 to 9</td>
<td>1</td>
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The percentage of the polls you will have provided an answer to, and your iClicker Participation mark (out of 10) will be updated weekly on A2L.

**Special Accommodations**

Students with learning challenges may receive accommodations. Please contact Student Accessibility Services (SAS): [http://sas.mcmaster.ca/](http://sas.mcmaster.ca/)

Students requiring accommodations for Religious, Indigenous, and Spiritual Observances (RISO) should contact their Faculty office as early as possible, preferably at the start of Term: [http://multifaith.mcmaster.ca/riso](http://multifaith.mcmaster.ca/riso)

**Acknowledgement of Course Policies**

Your registration and continuous participation (e.g. on A2L, in the classroom, etc.) to the various learning activities of ENVIR SC 1C03 will be an implicit acknowledgement of the full course policies outlined and posted on A2L, and in the Course Contract, or of any other that may be announced during lecture and/or on A2L. **It is your responsibility to read this course outline, to familiarize yourself with the course policies and to act accordingly.**

In addition, answers to commonly questions are available on Avenue, in a FAQ. **It is your responsibility to read it.**

Lack of awareness of the course policies cannot be invoked at any point during this course for failure to meet them. It is your responsibility to ask for clarification on any policies that you do not understand.

The instructor reserves the right to modify elements of the course and will notify students accordingly (in class and post any changes to the course Avenue to Learn). **The schedule is only a guideline and may be modified during the course of the class.**

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. **It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.**
# Schedule of Activities

*This lecture schedule is only a guideline and may be modified during the course of the class.*

<table>
<thead>
<tr>
<th>Day and Date</th>
<th>Lecture Topic</th>
<th>Online Module(s) to Watch</th>
<th>Assignments and Quizzes</th>
<th>Textbook Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, June 18</td>
<td>1) Introduction to Course; Principles of Sustainability</td>
<td>Module 1: What is Environmental Science?</td>
<td></td>
<td><em>Wright</em> – Chapter 1.1 – 1.3; <em>Lutgens</em> - Chapter 1.2 – 1.3</td>
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<td></td>
<td>2) The Importance of Climate and Weather</td>
<td>Module 2: Earth’s atmosphere – Composition and Structure</td>
<td><strong>Quiz 1 released @ 10:00 p.m.</strong></td>
<td><em>Lutgens</em> – Chapter 1.1</td>
</tr>
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<td>Wednesday, June 20</td>
<td>1) Atmosphere: Pressure, Density and Composition</td>
<td>Module 3: Atmospheric Pollution and Ozone</td>
<td><strong>Quiz 2 released @ 10:00 p.m.</strong></td>
<td><em>Lutgens</em> – Chapter 1.2: 1.4 – 1.5; Chapter 6.1 – 6.2</td>
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<td></td>
<td>2) Atmospheric Pollution, GHG, Ozone Layer</td>
<td>Module 4: Global Energy Balance; Module 5: Variation of Surface Temperature</td>
<td></td>
<td><em>Wright</em> – Chapter 19; <em>Lutgens</em> – Chapter 13.1 – 13.4</td>
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<tr>
<td>Monday, June 25</td>
<td>1) Global Energy Balance</td>
<td>Assignment 1: Radiation Budgets - <em>introduced</em></td>
<td></td>
<td><em>Lutgens</em> – Chapter 2.2 – 2.6</td>
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<td></td>
<td>2) Temperature and Urban Environments</td>
<td>Module 6: Climate Change; Module 7: Atmospheric Moisture</td>
<td><strong>Quiz 1 due @ 10:00 p.m.</strong></td>
<td><em>Lutgens</em> – Chapter 2.1, Chapter 3</td>
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<td>Wednesday, June 27</td>
<td>1) Climate Change</td>
<td>Module 8: Adiabatic Processes and Cloud Formation</td>
<td><strong>Quiz 2 released @ 10:00 p.m.</strong></td>
<td><em>Lutgens</em> – Chapter 4.1 – 4.4</td>
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<td>2) Atmospheric Moisture</td>
<td>Module 9: Precipitation and Acid Rain</td>
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<td>Monday, July 2</td>
<td><strong>CANADA DAY – NO CLASSES</strong></td>
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<td>Wednesday, July 4</td>
<td>1) Adiabatic Processes and Clouds</td>
<td>Assignment 1: Radiation Budgets - <em>due@ 4:30 p.m.</em></td>
<td></td>
<td><em>Lutgens</em> – Chapter 4.5 – 4.8, Chapter 5.1 – 5.3</td>
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<td></td>
<td>2) Precipitation</td>
<td>Module 10: Precipitation and Acid Rain</td>
<td></td>
<td><em>Lutgens</em> – Chapter 5.4 – 5.7; Chapter 13.5</td>
</tr>
<tr>
<td>Day and Date</td>
<td>Lecture Topic</td>
<td>Online Module(s) to watch</td>
<td>Assignments and Quizzes</td>
<td>Textbook Reading</td>
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| Monday, July 9     | 1) Hydrologic Cycle and Water Balance | **Module 10**: The Hydrologic Cycle and Water Balance | Story Map Project Progress Check  
Quiz 2 due @ 10:00 p.m.  
Quiz 3 released @ 10:00 p.m. | Wright – Chapter 10.2;  
Christopherson – Chapter 9 |
|                    | 2) Winds                           | **Module 11**: Winds                                           |                                                                  | Lutgens - Chapter 6.1, 6.3  
– 6.6                            |
| Wednesday, July 11 | 1) Atmospheric Circulation and Long-Range Transport | **Module 12**: The Global Atmospheric Circulation  
**Module 13**: The Global Oceanic Circulation | Assignment 2: Acidification – introduced | Lutgens – Chapter 7.1 – 7.7  
Lutgens – Chapter 7.7 – 7.10 |
|                    | 2) Oceanic Circulation             |                                                                  |                                                                  |                                 |
| Monday, July 16    | 1) Global Climate                  | **Module 14**: Global Climate  
**Module 15**: Water Resources | Quiz 3 due @ 10:00 p.m.  
Quiz 4 released @ 10:00 p.m. | Lutgens – Chapter 8;  
Christopher – Chapter 10 |
|                    | 2) Water Resources                 |                                                                  |                                                                  | Wright – Chapter 10.1            |
| Wednesday, July 18 | 1) Soils                           | **Module 16**: Soils  
**Module 17**: Soils and Water | Assignment 2: Acidification – due @ 4:30 p.m.  
Assignment 3: Water Balance - introduced | Wright – Chapter 10.3;  
Christopherson – Chapter 9       |
|                    | 2) Soils and Water                 |                                                                  |                                                                  |                                 |
| Monday, July 22    | 1) Nutrients                        | **Module 18**: The Nutrient Cycles  
**Module 19**: Ecosystem Processes | Quiz 4 due @ 10:00 p.m.  
Quiz 5 released @ 10:00 p.m. | Wright – Chapter 3.5,  
Chapter – 20.3                |
|                    | 2) Ecosystems                      |                                                                  |                                                                  | Wright – Chapter 3.1 – 3.4,  
Chapter 5.1 – 5.3, Chapter 6   |
| Wednesday, July 24 | 1) Water Pollution                 | **Module 20**: Water Pollution  
**Module 21**: Waste Management | Assignment 3: Water Balance - due @ 4:30 p.m. | Wright – Chapter 20.1               |
|                    | 2) Waste Management                |                                                                  |                                                                  | Wright – Chapter 20.2,  
Chapter 21                          |
| Monday, July 29    | 1) Hazardous Chemicals             | **Module 22**: Hazardous Chemicals  
**Module 23**: Global Population and Sustainability | Quiz 5 due @ 10:00 p.m.  
Story Map Project - due @ 4:30 p.m. | Wright – Chapter 22              |
|                    | 2) Global Population and Sustainability |                                                                  |                                                                  | Wright – Chapter 1.4 – 1.5,  
8                                 |
|                    | 3) COURSE WRAP-UP                   |                                                                  |                                                                  |                                 |
| Wednesday, August 1|                                  |                                                                  |                                                                  |                                 |

FINAL EXAM
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