Engi 9601, Envs 6004: Environmental Pollution and Mitigation

Instructor: Cynthia Coles  
E-mail: ccoles@mun.ca  
Phone: 864-8704  
Office Location: EN-3004  
Office Hours: Tu, Th, 1:30 – 2:00, Wed., 2:00 – 3:00

Teaching Assistant: Ms. Zhiwen (Joy) Zhu  
E-mail: zhiwenz@mun.ca  
Phone:  
Office Location: EN-2051  
Office Hours: By appointment

Website: http://www.engr.mun.ca/~ccoles/

Communication: The professor can be reached at her MUN email address at any time or at her MUN office phone during office hours.

COURSE DESCRIPTION:

An introduction to air pollution will be followed by a study of climate change, its impacts, implications and management. Climate change projects will be undertaken by students working in groups and individual assignments will be completed in class. Noise pollution and water quality management will be introduced. The study of sustainability will include population growth, planetary boundaries, biodiversity, water and drought, and agriculture and food security. Students will individually research a biodiversity related topic.

PREREQUISITES: Engineering or Science undergraduate degree

SCHEDULE: LECTURE: Tues. & Thurs. 12:00 noon -1:15 pm  Room: EN 4008

CREDIT VALUE: 3 credits

RESOURCES:

TEXT BOOKS
- Unprecedented: Can Civilization Survive the CO2 Crises?, 2015, D. R. Griffin, Clarity Press, QC 903 .G825 2015 (1 copy QEI and online access)

REFERENCES - BOOKS
- The Leap: How to Survive and Thrive in the Sustainable Economy, 2011, C. Turner, Random House Canada (some urban planning ideas, S938 O87 2010)
and D. Hesse, Prentice Hall. (for help with your writing, PE 1408 T696 2006)


REFERENCES – JOURNAL PAPERS

- Marcott, S.A., Shakun, J.D., Clark, P.U., Mix, A.C., 2013, A Reconstruction of Regional and Global Temperature for the Past 11,300 Years, Science, 339(6124):1198-1201.
- Pawłowski, A., 2008, How many dimensions does sustainable development have?, Sustainable Development, 16:81-90

REFERENCES – VIDEOS
- https://www.youtube.com/watch?v=bbvnEfgzfu8
REFERENCES – WEBSITES

- http://www.arb.ca.gov/research/indoor/clguide.pdf
- https://www.youtube.com/watch?v=SdqUylTUYkg
- http://www.ccohs.ca/oshanswers/phys_agents/exposure_can.html
- http://nptel.ac.in/courses/105104102/Lecture%2040.htm
- http://naturalunseenhazards.wordpress.com/tag/cyanobacteria/
- http://pennspectrums.org/2013/12/01/what-is-the-implication-of-a-growing-world-population/
- https://www.populationeducation.org/content/population-information
- http://www.mapsofworld.com

MAJOR TOPICS:
• Air pollution, terminology, criteria air contaminants, human health, air pollution disasters, indoor air pollution, acid rain, ozone depletion, global climate and warming, areas of concern, how cities make their own weather, meteorology and dispersion of pollutants, air pollution control (Chapter 9)
• Historical temperatures, greenhouse effect, Intergovernmental Panel on Climate Change (IPCC), climate change impacts, monitoring, mitigation, adaptation and ocean changes (Chapter 9, starting on p. 613), recent news and comedic portrayals
• Noise pollution, detrimental effects, noise properties, terminology and characterization, sound pressure levels, sound frequencies, noise rating systems, noise transmission, traffic noise prediction, noise control, standards (Chapter 10)
• Water quality management, BOD calculations, determination of BOD constants, laboratory BOD measurement, COD, TOC, ThOD, re-aeration of rivers and dissolved oxygen sag curve, lakes management, eutrophication, cyanobacteria (Chapter 7)
• Sustainable development concepts and overview, moral aspects, human population sustainability, planetary boundaries, key areas including biodiversity and ecosystem functions and services, water and drought, agriculture and food security (Chapter 13)

LEARNING OUTCOMES:

Upon successful completion of Engi 9601/Envs 6004, the student will be able to:

1. Understand current and future climate change impacts and challenges
2. Identify and use valid sources of information
3. Source, read and understand academic articles related to biodiversity.
4. Appreciate the value of lifelong learning and ever-evolving environmental issues.
5. Use a simple model to estimate traffic noise with and without shielding
6. Communicate technical information in a clear and effective manner in writing and orally
7. Have a good appreciation for basic aspects of sustainability
8. Have an understanding of simple water quality models

ASSESSMENT:

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<tr>
<th>Assignment</th>
<th>Proposed Due Dates</th>
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<tr>
<td>Individual biodiversity paper (date for final submission)</td>
<td>25% Thurs., Oct. 8 at 12:00 noon</td>
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<tr>
<td>Biodiversity presentation and participation</td>
<td>15% Week of Oct. 26</td>
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<tr>
<td>Participation</td>
<td>5%</td>
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<td>Three assignments in Class</td>
<td>15% Sept. 29, Oct. 15, Nov. 3</td>
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<tr>
<td>Climate Change Group Project and presentation</td>
<td>25% Week of Nov. 23</td>
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<tr>
<td>Midterm class test</td>
<td>15% Thurs., Nov. 12</td>
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The three assignments will be from “Unprecedented: Can Civilization Survive the CO₂ Crises?”,
1) pages 11-32, “Introduction” and “Extreme Weather” (22 pages),
2) pages 68-79 and 118-133, “Sea Level Rise” and “Climate Wars”, (27 pages), and
No new work will be assigned for submission after Friday Nov. 20.
Last day of class is Dec. 4

The midterm test will include closed book theory and open book numerical problems for which the only electronic aid permitted will be scientific calculators. Problems, not to be handed in, and with solutions will be assigned in preparation for the class test. The paper is to be submitted as an electronic Word file. The student needs to make sure that all images are printable and this might be checked by saving the document as a PDF file. A late submission will result in a 5% deduction per day. The group project may require permissions.

During class time personal laptops should be turned off, phones should be turned off to calls, and recording or any other electronic devices should be turned off, unless otherwise instructed by the professor. However, phones can be turned on to photograph figures or tables from the class notes.

ACADEMIC INTEGRITY AND PROFESSIONAL CONDUCT:

Students are expected to conduct themselves in all aspects of the course at the highest level of academic integrity. Students are encouraged to consult Memorial University’s Code of Student Conduct at http://www.mun.ca/student/conduct/

Any student found to commit an academic offence will be dealt with according to the practices as outlined by the School of Graduate Studies. The related calendar information and a description of what constitutes an academic offence is available at http://www.mun.ca/regoff/calendar/sectionNo=GRAD-0029

INCLUSION AND EQUITY:

Students who require physical or academic accommodations are encouraged to speak privately to the instructor so that appropriate arrangements can be made to ensure your full participation in the course. All conversations will remain confidential.

The university experience is enriched by the diversity of viewpoints, values, and backgrounds that each class participant possesses. In order for this course to encourage insightful and comprehensive discussion among class participants, there is an expectation that dialogue will be collegial and respectful across disciplinary, cultural, and personal boundaries.

STUDENT ASSISTANCE: Student Affairs and Services offers help and support in a variety of areas, both academic and personal. More information can be found at www.mun.ca/student.

Student assistance in writing may be obtained through the Writing Centre and their contact information and other details can be found at http://www.mun.ca/writingcentre/contact/