Engi 9601, Envs 6004: Environmental Pollution and Mitigation

Instructor: Cynthia Coles  
E-mail: ccoles@mun.ca  
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Office Location: EN-3004  
Office Hours: Tues. 1:30 – 1:50, Wed. 2:00 – 2:50, Thurs. 1:30 – 2:00

Teaching Assistant: Mr. Javid Shadbahr  
E-mail: js6235@mun.ca  
Phone:  
Office Location: EN-  
Office Hours: By appointment

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

Communication: The professor can be most easily reached at her MUN email address.

COURSE DESCRIPTION:

Air pollution is introduced followed by study of climate change impacts and management. Noise pollution and water quality management are introduced. Sustainability topics include population growth, planetary boundaries, biodiversity, water scarcity and food security.

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 QEII 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)

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.
• Rasmussen, P.E., Subramanian, K.S., Jessiman, B.J., A multi-element profile of housedust in
relation to exterior dust and soils in the city of Ottawa, Canada, The Science of the Total Environment, 267:125-140.


REFERENCES – VIDEOS

• https://www.youtube.com/watch?v=B11kASPfYxY (History of Climate Change negotiations)
• http://www.youtube.com/watch?v=SdgUyLTUYkg (Ocean conveyor)
• http://www.theguardian.com/environment/true-north/2016/may/12/the-arsonists-of-fort-mcmurray-have-a-name
• https://www.youtube.com/watch?v=F47lX5d1Fxy (Toilet Water PSA)
• http://www.dailymotion.com/video/x2n6ubl (Colbert, Republican Climate Change denial)
• https://www.youtube.com/watch?v=m74EBa7UOP8 (Uncensored, John Oliver)
• https://www.youtube.com/watch?v=CDOLdF0pNQ (Cyanobacteria)
• https://www.youtube.com/watch?v=TmfcJ_PoeMc (Weathergirl goes rogue)
• http://www.ted.com/talks/johan_rockstrom_let_the_environment_guide_our_development?language=en
• https://www.youtube.com/watch?v=ysa5OBhXz-Q (How wolves change rivers)

REFERENCES – WEBSITES

• http://www.cbc.ca/radio/unreserved (Interview with David Suzuki)
• http://www.theguardian.com/environment/2016/may/09/people-may-be-breathing-in-microplastics-health-expert-warns
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

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 and be able to engage in lifelong learning and keep abreast of environmental issues.
3. Source, read and understand academic articles related to the environment.
4. Estimate traffic noise with and without shielding
5. Communicate technical information clear and effectively in writing and orally
6. Have a good introductory appreciation of sustainability issues.
7. Have an understanding of simple water quality models

**ASSESSMENT:**

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<th>Component</th>
<th>Proposed Due Dates</th>
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<tr>
<td>Individual paper (date for final submission)</td>
<td>25% Th, Oct. 6, 12:00 noon</td>
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<td>Individual Presentation</td>
<td>15% Oct. 13 Th, 18 Tu, 20 Th</td>
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<td>Three assignments in Class</td>
<td>12% Tu, Sept. 27, Nov. 1, Nov. 15</td>
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<td>Noise measurements and group presentation</td>
<td>13% Tu Nov. 29, Th Dec. 1</td>
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<td>Final Exam</td>
<td>30% Wed Dec. 7 – Fri Dec. 16</td>
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Assignments will be from “Unprecedented: Can Civilization Survive the CO₂ Crises?”,
1) pages 11-23 and 33-39, “Introduction” and “Heat Waves” (20 pages),
2) pages 134-150, “Ecosystem Collapse and Extinction”, (17 pages), and
3) pages 200-226, “Political Failure” (27 pages).

*The final exam will include a closed book theory part and an open book numerical part with only scientific calculators being permitted. The paper is to be submitted as an electronic Word file and students must make sure images are printable. The group project may require permissions.*

*Personal laptops and recording or other electronic devices should be turned off during class. One exception is that cell phones may be used to photograph images 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/](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 is available at [http://www.mun.ca/regoff/calendar/sectionNo=GRAD-0029](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.

Diversity of viewpoints, values, and backgrounds can enrich the university experience. For 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.

The Writing Centre will assist students with their writing. To book an appointment refer to http://www.mun.ca/writingcentre/, call 864-3168 or email ennisd@mun.ca.

ADDITIONAL INFORMATION

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Engi 9601: Environmental Pollution and Mitigation
Engi 9614: Renewable Energy and Resource Conservation