

ENV 452 – Environmental Science Seminar: Current Topics in Environmental Science
University of Toronto, School of the Environment
Spring Term 2017

This course focuses on current challenges in environmental science, ranging from the carbon cycle, to policy, to greenhouse gas emissions, to biological and health impacts. There will be a variety of guest speakers throughout the term. One focus of the course will be to read scientific papers, and evaluate the presentation of their results in news articles. Students will be actively involved in leading and participating in class discussions.

Time and Place: The course meets from 10:10 am - 12 pm every Tuesday, and 10:10 – 11 am every Wednesday. We will meet in ES1042.

Instructor: Professor Debra Wunch (School of the Environment and Department of Physics), room 707A, McLennan Physical Laboratory, 60 St. George Street, debra.wunch@utoronto.ca

Office hours: Wednesdays at 11:10 am - 12 pm in MP707A starting Jan 11, 2017.

Website: I will communicate with you using the course Blackboard site. You are responsible for consulting it regularly for updates and to access readings.

Textbook: We will read *The Long Thaw* by David Archer. It is on reserve at the Gerstein Science Library and one electronic copy is available through the University's electronic resources. Resources and links to other readings, such as selections from the *IPCC Climate Change 2013: The Physical Science Basis* report will be available on the course Blackboard site.

Evaluations:

News articles (3x15%: Jan 25, Feb 15, Mar 15)	45 %
Participation (in class)	5 %
Student-led readings (2x5%)	10 %
Final project oral presentation (in class April 4)	15 %
Final project written report (due April 5)	25 %

Final Project & Presentation: You will read, synthesize and present results and methods from a scientific article of your choosing and references therein. Your project will focus on any current challenge (within the past 2 years) in climate or the carbon cycle, from a leading journal (e.g., Science, Nature, Geophysical Research Letters, Proceedings of the National Academy of Sciences, Environmental Science & Technology). The written component will be 3000-4000 words, and will include relevant tables, figures, and references. The oral presentation will be delivered in class, will be 20 minutes in duration, and will be supported by a Power Point slideshow.

News articles: Select three guest lectures on which to write a 1-page (~500-word) news article. You may include one or two illustrative images. Write two headlines for the article: a “click-bait” headline and a truthful (but engaging) headline.

Student-led readings: In each “student-led readings” class, two students will each (independently) select a scientific paper from the peer-reviewed journal literature on an environmental topic that has received news coverage in the past year. The students will post their selections to Blackboard one week before the scheduled student-led readings class. The entire class will critically read and discuss both papers and their news coverage. Each student is responsible for selecting two papers and corresponding news articles.

Late work policy: Short reports are due in hard copy at the beginning of the class on the dates listed above. Work handed in late will be penalized at 10% per day, including the weekend for up to 7 days, after which it will not be accepted. Late work can be submitted to Prof. Wunch in MP 707A.

Date	Week	Topics	Reading (check Blackboard for complete citations and links)	Due date for
Jan 10	1	Introduction	<ul style="list-style-type: none"> The Long Thaw: Prologue IPCC Summary for Policymakers 	
Jan 11		The Greenhouse Effect	<ul style="list-style-type: none"> The Long Thaw: Chapter 1 IPCC Technical Summary Selections 	
Jan 17	2	Guest Speaker: Prof. Eric Kort (U. Michigan) – Methane emissions from the oil and gas industry	<ul style="list-style-type: none"> Newspaper article: Space-based methane maps find largest US signal in Southwest Scientific paper: Kort et al. 	
Jan 18		Changes We've Seen	<ul style="list-style-type: none"> The Long Thaw: Chapter 2 IPCC Technical Summary Selections 	
Jan 24	3	Guest Speaker: Prof. Stephen Scharper (UofT) – The Land Ethic	<ul style="list-style-type: none"> The Land Ethic by Aldo Leopold 	
Jan 25		Forecast of the Century	<ul style="list-style-type: none"> The Long Thaw: Chapter 3 IPCC Selections 	News Article #1 Due Student-led readings posted to BB
Jan 31	4	Millennial and Glacial Cycles	<ul style="list-style-type: none"> The Long Thaw: Chapter 4 The Long Thaw: Chapter 5 IPCC Selections 	
Feb 1		Student-led readings	student papers and articles	
Feb 7	5	Guest Speaker: Prof. Kate Neville (UofT): The	<ul style="list-style-type: none"> Neville paper Related newspaper article 	

		Politics of Fracking and Pipeline Natural Gas		
Feb 8		Geologic Cycles	<ul style="list-style-type: none"> • The Long Thaw: Chapter 6 • IPCC Selections 	Student-led readings posted to BB
Feb 14	6	Summary to Date; The Fate of Fossil CO2 Student-led readings	<ul style="list-style-type: none"> • The Long Thaw: Chapter 7 • The Long Thaw: Chapter 8 • IPCC Selections • student-led readings 	
Feb 15		Guest Speaker: Prof. Douglas Macdonald		News Article #2 Due
Feb 21		Reading Week (no class)		
Feb 22		Reading Week (no class)		
Feb 28	7	Guest Speaker: Prof. Christian Frankenberg (Caltech): The Global Methane Puzzle	<ul style="list-style-type: none"> • Frankenberg et al. paper • Related newspaper article 	
Mar 1		Ocean Acidification	<ul style="list-style-type: none"> • The Long Thaw: Chapter 9 • IPCC Selections 	
Mar 7	8	Guest Speaker: Prof. Njal Rollinson (UofT): Ecology and Climate	<ul style="list-style-type: none"> • Rollinson et al. paper • Related newspaper article 	
Mar 8		Carbon Cycle Feedbacks	<ul style="list-style-type: none"> • The Long Thaw: Chapter 10 • IPCC Selections 	Student-led readings posted to BB
Mar 14	9	Sea Level Rise; The Next Ice Age	<ul style="list-style-type: none"> • The Long Thaw: Chapters 11 & 12 • IPCC Selections 	
Mar 15		Student-led readings	student papers and articles	News Article #3 Due
Mar 21	10	Epilogue	<ul style="list-style-type: none"> • The Long Thaw: Epilogue 	
Mar 22		Introduction to the Final Report		
Mar 28	11	Guest Speaker: Prof. Kimberly Strong (UofT): Atmospheric remote sounding	<ul style="list-style-type: none"> • Strong et al. paper • newspaper article 	
Mar 29		Discussion of Final Report		
Apr 4	12	Oral Presentations		Final oral report
Apr 5		Final Reports Due**		Final written report

**There is an assignment drop box inside the admin office (ES1016V), in the 33 Willcocks wing of Earth Sciences. Note that assignments must be dropped off no later than 5 pm on Apr 5, or will be subject to late penalties.

Academic Integrity: While discussions among classmates are encouraged, any material that you submit or present MUST represent your own independent work and comprehension. Academic integrity is fundamental to learning and scholarship at the University of Toronto. Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that the U of T degree that you earn will be valued as a true indication of your individual academic achievement, and will continue to receive the respect and recognition it deserves.

Familiarize yourself with the University of Toronto's *Code of Behaviour on Academic Matters* (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>). It is the rule book for academic behaviour at the U of T, and you are expected to know the rules. Potential offences include, but are not limited to:

In papers and assignments:

- Using someone else's ideas or words without appropriate acknowledgement.
- Copying material word-for-word from a source (including lecture and study group notes) and not placing the words within quotation marks.
- Submitting your own work in more than one course without the permission of the instructor.
- Making up sources or facts.
- Including references to sources that you did not use.
- Obtaining or providing unauthorized assistance on any assignment including:
 - working in groups on assignments that are supposed to be individual work;
 - having someone rewrite or add material to your work while "editing".
- Lending your work to a classmate who submits it as his/her own without your permission.

Misrepresentation:

- Falsifying or altering any documentation required by the University, including doctor's notes.
- Falsifying institutional documents or grades.

The University of Toronto treats cases of academic misconduct very seriously. All suspected cases of academic dishonesty will be investigated following the procedures outlined in the *Code*. The consequences for academic misconduct can be severe, including a failure in the course and a notation on your transcript. If you have any questions about what is or is not permitted in this course, please do not hesitate to contact me. If you have questions about appropriate research and citation methods, seek out additional information from me, or from other available campus resources like the [U of T Writing Website](#). If you are experiencing personal challenges that are having an impact on your academic work, please speak to me or seek the advice of your college registrar.

Accommodations: Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability or health consideration that may require accommodations, please feel free to approach the instructor and/or Accessibility Services at (416) 978 8060; <http://accessibility.utoronto.ca>

Absences: Students who miss classes, for legitimate reasons or otherwise, are responsible for making up the missed material. Students who miss a presentation or report deadline should contact Professor Wunch as soon as possible, and no later than one week after returning to class. A legitimate reason for an absence or missed deadline due to medical, personal, or family reasons should be documented by one of the following: 1) U of T Student Medical Certificate; 2) Student Health or Disability Related Certificate; 3) College Registrar's Letter; or 4) Accessibility Services Letter.