

Faculty of Science Course Syllabus
Department of Earth and Environmental Sciences

ENVS 1200
Environmental Challenges
Winter 2020

Instructor(s): *Dr. Heather Cray* *hcray@dal.ca* *LSC room 810*

Lectures: *Tuesdays and Thursdays 10:05-11:25am* *LSC Psychology P5260*

Tutorials: You will have signed up for (almost) weekly tutorials (tutorials start January 13). Check the Academic Timetable for the location of your tutorial.

Office Hours: Thursdays 12:30-2pm except for the week of Study Break

Teaching Assistants	Email	Tutorials
Nadia Dalili	nadia.dalili@dal.ca	Th 1:05-2:25 & 2:35-3:55
Victoria Watson	vwatson@dal.ca	W 11:25-12:55 & 1:05-2:25
Heather McGuire	h.mcguire@dal.ca	Th 2:35-3:55 & F 9:35-10:55

Course Description

The environment is a dynamic web of interactions between all components of the lithosphere, the hydrosphere, the biosphere and the atmosphere. Humans are one component of the biosphere, and we are unique in that we have the capacity to make individual and community decisions that can have a tremendous impact on many other components of the environment. How can we predict the effects of our actions? How can we mitigate our impacts? We must understand the components of the environment and the interactions between them in order to answer these questions. Current Environmental Challenges introduces students to Environmental Science, explores Earth systems, the environmental problems and the laws, ethics and economics that impinge on our individual and community decisions about the environment. This course also introduces students to atmospheric science, climate change, physics of energy, non-renewable and renewable sources of energy, waste, and urbanization.

Course Objectives/Learning Outcomes

- *Illustrate Earth's Energy Balance*
- *Describe the greenhouse and enhanced greenhouse effect*
- *Describe the consequences of global climate change*
- *Describe the fundamentals of the first and second law of thermodynamics*
- *Describe the cause and effect of ozone depletion*
- *Describe the formation of fossil fuels*
- *Describe how fossil fuels are used to generate energy*
- *Describe the environmental impacts of using fossil fuels*
- *Describe the benefits and challenges associated with renewable energy options*

- *Describe the benefits and challenges associated with nuclear energy*
- *Describe the limitations of mainstream economics that make it an unsustainable model*
- *Describe how ecological economics propose to address the limitations of mainstream economics*
- *Describe life cycle assessment as a tool to assess environmental impacts*
- *Describe the types of waste that humans generate, particularly in countries like Canada*
- *Describe the ways we deal with solid waste and the trade-offs of each option*
- *Describe the global pattern of urbanization*
- *Describe the environmental trade-offs associated with cities or urban areas*
- *Describe the environmental and human health challenges presented by suburban sprawl*
- *Apply the concepts of environmental sustainability to life on a university campus*
- *Work through environmental problems quantitatively*
- *Develop awareness of the environment and your impact on the environment*
- *Practice the process of science and communicate scientific results*

Course Materials

- S. Karr et al. 2018 Environmental Science for a Changing World. 3rd Edition with Sapling Plus. You can purchase the e-book alone or the loose-leaf version with Sapling Plus. The text is required for the class.
- iClicker software on mobile device (laptop, phone, iPad). The clicker software (REEF) is automatically bundled with your textbook purchase on a 12-month subscription at no extra cost. You will need to set-up your account prior to the start of classes. Instructions on how to do so will be posted to Brightspace.
- Brightspace: The course syllabus, lecture slides, announcements, assignment information, out-of-text readings, and other pertinent information can be found on our Brightspace. **You are expected to check this site regularly.**

Course Assessment

Mid-term	20%
Brightspace reading quizzes	5%
Tutorial assignments	30%
Final exam	40%*
In-class clicker quizzes	5%
Total	100%

* you must pass the final exam in order to pass the course. The final exam is scheduled by the Registrar.

Brightspace reading quizzes

There will be 11 quizzes based on the textbook readings spread throughout the term. Each quiz will be available on Brightspace on the days leading up to its designated “quiz day”. Each quiz will close at 11:59 pm on the day of the quiz as listed on the schedule. Each quiz will consist of 4-5 multiple-choice questions based on the assigned reading for that week. The 5% for your final grade will come from the average of your 10 highest scores from the 11 quizzes. This means you have one freebie that will not count towards your final grade. Quiz days are noted in the class schedule as Q1-Q11. There are no make-up quizzes.

In-class clicker quizzes

There will be 11 comprehension quizzes based on the material from the previous week's lecture and tutorials. Each quiz will only be available in class and will use the iClicker response system that comes with your textbook. You must set up your iClicker account by the third week of classes (follow instructions posted on Brightspace). The 5% for your final grade will come from the average of your 10 highest scores from the 11 quizzes. This means you have one freebie that will not count towards your final grade. These quizzes are not noted in the class schedule.

Tutorials

The almost-weekly tutorials are led by teaching assistants (TAs) and will make up **30% of your final grade**. This grade is derived from completed assignments and attendance at each tutorial. The tutorial activities are designed to reinforce the key concepts covered in the lectures and to build your scientific literacy using exercises, debates and a data collection and analysis project. You must attend tutorials in order to hand in the associated assignment. **You must attend the tutorial section in which you are registered.** If you anticipate that you will be unable to attend one of your tutorial sessions please contact your usual TA and the TA whose tutorial you wish to attend via email the week before to receive permission to attend one of the other tutorial sections. If you miss a topic altogether you must contact Dr. Cray and your TA before you miss the tutorial and fill out a Student Declaration of Absence (see below).

Mid-term exam

There is one in-class mid-term test worth 20% of your grade. You will have a full class period, 1 hour and 20 minutes, to complete the test. The test will consist of multiple-choice and written questions covering all material from lectures, readings and tutorials. The **Midterm exam is scheduled for February 25th**.

Final Exam

There will be a final exam held during the final exam period. The winter term final exam period is **April 8-24th**. The exam dates and locations will be announced by the Registrar's Office in early February. The exam will consist of questions based on material from the **whole term** and is worth 40% of your grade. You will have a total of **3 hours** to complete the exam. The exam will be a combination of multiple choice and written questions covering all material from lectures, readings and tutorials from that term. **You must receive a passing grade on the final exam in order to pass the course.** Note that, except for documented sudden catastrophic circumstances, no make-up exam or rewrites will be offered. It is your responsibility to write the exam when it is scheduled.

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D	(50-54)
A (85-89)	B (73-76)	C (60-64)	F	(<50)
A- (80-84)	B- (70-72)	C- (55-59)		

Course Policies

Missed or Late Academic Requirements due to Student Absence

Dalhousie students are asked to take responsibility for their own short-term absences (3 days or less) by contacting their instructor by phone or email **prior** to the academic requirement deadline or scheduled time and by submitting a completed Student Declaration of Absence (SDA) to their instructor via

Brightspace in case of missed or late academic requirements. The SDA form can be found on our Brightspace page under “Assignments”. Only **TWO** separate Student Declaration of Absence forms may be submitted per term for this course. **The Student Declaration of Absence does not apply to our mid-term, final exam, or quizzes.** Once the SDA has been submitted, alternate arrangements for the missed or late assignment will be at the discretion of the instructor.

Assignments submitted late without prior notification and the submission of an SDA, or without an approved extension will be deducted 10% per day. Extensions are granted with good reason and **must be requested at least one week prior** to the assignment’s original due date.

If you miss the mid-term exam for any reason, the 20% from your midterm will be added to your final exam. There are no make-up midterm or final exams.

Collaboration

Except where explicitly stated (group assignment), students are expected to work individually on assignments for this course.

Course Content

ENVS 1200 Winter 2020 Lecture Schedule

Week	Lecture	Date	Topic	Readings
1	1	7 Jan.	Course Introduction, Environmental Ethics and Education	Ch. 1.1
	2	9 Jan.	Atmospheric Science, Ozone, Environmental Policy	Ch 5.2 – Q1
2	3	14 Jan.	Climate change Part 1	Ch. 10.2 – Q2
	4	16 Jan.	Ecological Economics	Ch. 5.1 – Q3
3	5	21 Jan.	Life Cycle Assessment: Guest Lecture: Prof. Peter Tydmers	Ch. 5.1 and Reading 1
	6	23 Jan.	Climate change Part 2	Ch. 10.2
4	7	28 Jan.	Energy fundamentals Part 1: Guest Lecture: Prof. Laurent Kreplack	Youtube video and Reading 2*
	8	30 Jan.	Energy fundamentals Part 2: Guest Lecture: Prof. Laurent Kreplack	See above
5	9	4 Feb.	Energy: Intro and nonrenewables part 1: Coal	Ch. 9.1 – Q4
	10	6 Feb.	Nonrenewable energy part 2: Oil and natural gas	Ch. 9.2 – Q5
6	11	11 Feb.	Nonrenewable energy part 3: Nuclear power	Ch. 11.1 – Q6
	12	13 Feb.	Review for midterm	
7		18 Feb.	Study Break – no classes	
		20 Feb.	Study Break – no classes	
8	13	25 Feb.	Midterm in class	
	14	27 Feb.	Renewable energy: Hydro dams and reservoirs	Ch. 11.2 – Q7
9	15	3 Mar.	Hydroelectricity continued	Ch. 11.2
	16	5 Mar.	Renewable Energy: Wind and Solar	Ch. 11.2
10	17	10 Mar.	Renewable Energy: Battery storage: Guest Lecture Prof. Jeff Dahn	Reading 3
	18	12 Mar.	Renewable Energy: Biofuels	Ch. 11.3 – Q8
11	19	17 Mar.	Urbanization	Ch. 4.2 – Q9
	20	19 Mar.	Waste management: Solid waste, reduction	Ch. 5.3 – Q10
12	21	24 Mar.	NS solid waste resource management	Reading 4
	22	26 Mar.	Urbanization continued	Ch. 4.2
13	23	31 Mar.	Human Health and Environment	Ch. 4.3 – Q11
	24	2 Apr.	Review for Final Exam	
		TBA	Winter term final exam during final exam period (8 – 24 April)	

*Reading #2 assigned for Lectures 7 and 8 is there for your use as a reference to review the key concepts from lectures 7 and 8. The exam will only cover the concepts covered in class and not the entire reading.

*Remember that only the Brightspace Reading Quizzes are shown on the schedule; they are due the day of the quiz by 11:59pm.

Readings 1-4 can be found on our Brightspace page.

Tutorial schedule

Week 1 (6 - 10 Jan.): **No tutorials first week of class**

Week 2 (13 – 17 Jan.): **Tutorial 1:** Primary literature article (3%)

Week 3 (20 - 24 Jan.): **Tutorial 2:** Life Cycle Analysis (3%)

Week 4 (27 -31 Jan.): **Tutorial 3:** Mini research project – Data collection*

Week 5 (3 - 7 Feb.): **Tutorial 4:** Mini research project – Data analysis*

Week 6 (10 - 14 Feb.): **Tutorial 5:** Environmental projects and people presentations (3%)

Week 7 (17 - 21 Feb.): **Study break, no tutorials**

Week 8 (24-28 Feb.): **Tutorial 6: No tutorials or snow day make-up**

Week 9 (2 - 6 Mar.): **Tutorial 7:** Energy Efficiency (3%)

Week 10 (9 - 13 Mar.): **Tutorial 8:** Debate preparation

Week 11 (16 - 20 Mar.): **Tutorial 9:** Debates (5%)

Week 12 (23 - 27 Mar.): **Tutorial 10:** Visualizing the Environment short presentations (5%)

Week 13 (30 Mar. - 3 Apr.): **Tutorial 11:** Urban Design: the Mona Campbell Building (3%)

*You must attend and actively participate in Tutorials 3 and 4 to receive 5% participation marks for these two tutorials.

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University Policies and Statements

This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate

Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.

Information: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

Information: https://www.dal.ca/campus_life/academic-support/accessibility.html

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.

Code: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness

Statement: <http://www.dal.ca/cultureofrespect.html>

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit or e-mail the Indigenous Student Centre (1321 Edward St) (elders@dal.ca).

Information: https://www.dal.ca/campus_life/communities/indigenous.html

Important Dates in the Academic Year (including add/drop dates)

https://www.dal.ca/academics/important_dates.html

University Grading Practices

https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html

Missed or Late Academic Requirements due to Student Absence (policy)

https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html

Student Resources and Support

Advising

General Advising https://www.dal.ca/campus_life/academic-support/advising.html

Science Program Advisors: <https://www.dal.ca/faculty/science/current-students/academic-advising.html>

Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html

Black Students Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html

International Centre: https://www.dal.ca/campus_life/international-centre/current-students.html

Academic supports

Library: <https://libraries.dal.ca/>

Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html

Studying for Success: https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html

Copyright Office: <https://libraries.dal.ca/services/copyright-office.html>

Fair Dealing Guidelines <https://libraries.dal.ca/services/copyright-office/fair-dealing.html>

Other supports and services

Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html

Student Advocacy: <https://dsu.ca/dsas>

Ombudsperson: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html

Safety

Biosafety: <https://www.dal.ca/dept/safety/programs-services/biosafety.html>

Chemical Safety: <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>

Radiation Safety: <https://www.dal.ca/dept/safety/programs-services/radiation-safety.html>

Scent-Free Program: <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>