



Welcome to ENVS 1200.03 Current Environmental Challenges: Analysis and Solutions

Winter 2025

Dalhousie University acknowledges that we are in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq People and pays respect to the Indigenous knowledges held by the Mi'kmaq People, and to the wisdom of their Elders past, present and future. The Mi'kmaq People signed Peace and Friendship Treaties with the Crown, and section 35 of the Constitution Act, 1982 recognizes and affirms Aboriginal and Treaty rights. We are all Treaty people.

We acknowledge the histories, contributions, and legacies of the African Nova Scotian people and communities who have been here for over 400 years.

Instructors

Lectures and Course Coordinator: Dr. Sue Gass | Office: LSC 3082 | Email: susan.gass@dal.ca

Tutorials and Tutorial Assignments: Dr. Lexie Arnott | Office: LSC 3081 | Email: alexandra.arnott@dal.ca

We are looking forward to this course immensely. We will explore a range of current environmental challenges facing society. Our ENVS 1200 teaching team will help you understand the background that has led to these challenges, and we will explore potential solutions. The environmental challenges require us to dig into the natural sciences behind the causes and solutions, but also to consider the social and economic sides to these issues. You will encounter a multi-faceted approach to teaching in this course. We will do our best to introduce a range of learning techniques in the lectures and tutorials in hopes of engaging every one of you with the course material.

We have three teaching assistants joining this course. Each TA is responsible for leading two weekly tutorials. Take a minute to introduce yourself to your TA at your first tutorial session.

Teaching Assistants:	Emails	Tutorials
Sarah MacDonald	sarah.macdonaldd@dal.ca	Mondays 10:05 & 13:05
Sinead Addis	sinead.addis@dal.ca	Monday 14:35 and Thursday 14:35
Michelle Mann	michelle.mann@dal.ca	Wednesday 11:35 & Thursday 10:05

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, energy fundamentals including non-renewable and renewable sources of energy, waste, environmental health, and urbanization.

Learning Outcomes:



What's happening in the atmosphere? The thinning of stratospheric ozone does not cause global warming so why were we so worried about it? How can environmental policy be used to address environmental concerns?

- Describe the main sources of air pollution
- Describe the health, economic, social, and ecological consequences of air pollution
- Describe the cause and effect of ozone depletion.
- Describe how the international responded to ozone depletion.
- Describe the differences between stratospheric ozone depletion and climate change



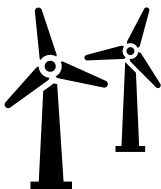
What does our current economic system have to do with ecosystem degradation? Can an ecological economic system help protect ecosystems?

- 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



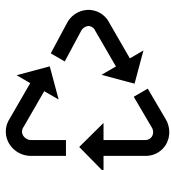
What is climate change and what can we do about it?

- Illustrate Earth's energy balance
- Describe the greenhouse and enhanced greenhouse effect
- Describe the causes and consequences of global climate change
- Describe how we can mitigate and adapt to climate change



Why did we start using fossil fuels in the first place? What are the alternatives?

- Describe the fundamentals of the first and second law of thermodynamics
- Describe the formation of fossil fuels
- Describe how fossil fuels are used to generate energy
- Describe the environmental, social, and economic impacts of using fossil fuels
- Describe the characteristics of renewable energy sources
- Describe how renewable energy sources can be captured and used in society
- Describe the benefits and challenges associated with renewable energy options
- Describe the benefits and challenges associated with nuclear energy



Before modern humans, waste didn't exist in the biosphere. What has changed to create waste and how do we deal with it?

- 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.



With more than half the world's human population living in cities, will this help or hinder our ability to address major environmental challenges?

- Describe the global pattern of urbanization
- Describe the environmental trade-offs associated with cities



Lectures

Wednesdays and Fridays 8:35-9:55 am in LSC Common Area Room 242.

Lecture periods will enhance textbook readings through class discussions, short videos, guest lectures, case studies, and working through questions/problems to solidify comprehension of key concepts. It is an active learning class! We prepare you for active learning by quizzing you on the readings before you come to class so you come prepared to use what you've learned by putting larger conceptual ideas together. This approach is more fun for all of us. Coming to class and participating are expected. We provide you with many opportunities to learn throughout the course, but you are responsible for acting on these and making this course a success.

Prepare for class by following these steps:

1. Complete the assigned readings.
2. Do the timed online quizzes by midnight the night before class.
3. Identify concepts that you are having difficulty with so you can work through these concepts and are prepared to ask questions about them.
4. Attend lectures and participate using TopHat
5. Review your notes after each lecture and create study aids based on lecture and reading materials

How to find the classroom: If you enter the LSC on the third floor coming in the doors opposite the Henry Hicks building you will turn right and walk down the stairs. Turn right again at the bottom of the stairs and the classroom is on our left.

Tutorials



The tutorials will give you a chance to dive deeper into the topics discussed in class while also working on quantitative reasoning, teamwork, and presentation skills. You have signed up for weekly tutorials (**tutorials start January 13th**). Please check your timetable for the day and time of your tutorial. You must attend the tutorial for which you are registered. All tutorials are held in LSC Biology Tower Room B2030. From Tim Hortons on the second floor of the LSC – look for the double doors that lead into the Biology Tower. Walk through the doors, past the elevators until you see the second door on your left. Go through here and look for B2030 on your left.



Office Hours

Thursdays 1:00 to 3:00 pm or by appointment in room LSC B3082.

Dr. Gass holds office hours each week to meet with students from this course. You can ask questions about the content in the course, clarification on assignments, or any other environmental science related questions. We can meet in-person, or we can set up a virtual appointment through MS Teams. You are not disturbing her during this time. Office hours have been set up for you.



Brightspace

The course syllabus, lecture slides, announcements, assignment information, quizzes, additional readings and videos, and other pertinent information can be found on our Brightspace. **You are expected to check this site regularly.**



Textbook - Required

S. Karr 2021 Environmental Science for a Changing World. 4rd Edition. The text is **required** for the class. Please see the link to the textbook on our Brightspace page. It is available to purchase as an e-book or as both e-book and hard copy in the bookstore.

TopHat – In class response software

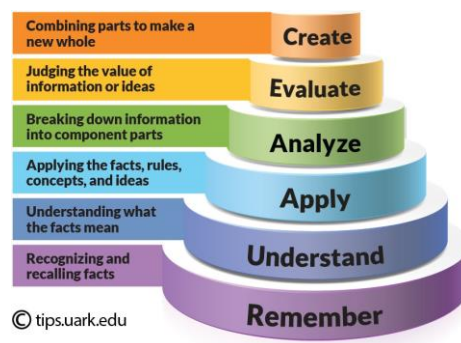


We will be using **Top Hat** (<https://tophat.com>) for class participation marks. You will submit answers to in-class questions using either an Apple or Android smartphone, tablet or computer web browser (Google Chrome or Firefox), or through text message (if enabled). For instructions on how to download the Top Hat app, please refer to the “TopHat” module found in our Brightspace course space.



Assessments

The quizzes, exams, and tutorial assignments that you will complete in this course are carefully designed to optimize your learning. We employ evidence-based approaches in designing this course. This means there is evidence to back-up the effectiveness of the teaching methods used. As an introductory course, there are a lot of new concepts and terminology and thus remembering and understanding that needs to happen. But additionally, our goal is to move beyond remembering and understanding and help you progress through Bloom’s taxonomy of learning (see diagram to the right), such that you are also applying, analyzing, evaluating and even creating information in this course.



Assessments in this course are set up with various learning goals in mind.

- The reading quizzes are to help provide you with incentive to come to class having completed the readings so we can move on from the basic material in the textbook to more in-depth discussions of the material. Therefore, the quiz deadlines are **the night before** the related lecture.

- Top Hat participation provides incentives to come to class and actively engage with the material. This will help you get the most out of attending class.
- The tutorial assignments are designed to help you apply the learning in the lectures and build analyzing and evaluation skills, as well as your presentation and teamwork skills.
- The midterm and final exam are an assessment of your level of understanding of the material covered in the course but will also test your ability to apply this knowledge.



How is my final grade determined?

Assessment	Value	Due Dates
Brightspace reading quizzes	5% (average grade from best 10 of 12)	As per class schedule
TopHat participation	5%	Participation during every lecture contributes to your overall score
Tutorial assignments	25% - (average of the best 7 out of 8 assignments)	See details below
Climate Champion Presentation	5%	Presentations will take place during week 11 tutorials
Mid-term exam	20%	Feb 28 th
Final exam*	40%	During the April exam period
Total	100%	

***You must pass the final exam to pass the course**

Brightspace reading quizzes: There will be 12 quizzes based on the textbook readings spread throughout the term. Each quiz will be available on Brightspace on the days leading up to the designated lecture. Each quiz will close at midnight the night **before** the related lecture. Each quiz will consist of 5 multiple-choice questions based on the assigned reading for that day. The 5% for your final grade will come from the average of your 10 highest scores from the 12 quizzes. This means you have two freebie quizzes that will not count towards your final grade. Lecture readings that will be quizzed are noted in the class schedule as Q1-Q12. There are no make-up quizzes.

Tutorial assignments

The weekly tutorials are led by teaching assistants (TAs) and coordinated by Dr. Arnott and will make up **30% of your final grade**. This grade is derived from completed assignments (25%) and the Climate Champion presentation (5%). The tutorial activities are designed to reinforce the key concepts covered in the lectures and to build your scientific literacy through a range of learning activities. Some assignments will be completed in groups while others will be completed individually. **You must attend the tutorial to be eligible to hand in the related assignment. You must attend both tutorials 6 and 7 to be eligible for the grades associated with these tutorials because tutorial 7 builds on group work completed during tutorial 6.**

There are eight tutorial assignments available to complete throughout the term. Your tutorial assignment grade will come from the average of seven assignments with the highest grades. Each assignment is thus worth 3.57% of your final grade.

Tutorial schedule

Week	Dates	Tutorials	Topic	Assessment
1	Jan 6-10	No tutorials	No tutorials the first week of classes	No assessment
2	Jan 13-17	Tutorial 1	Introductions and ozone review	No assessment
3	Jan 19-24	Tutorial 2	Climate change and data Part 1 <i>*Bring a laptop if you have one</i>	Individual Assignment worth 3.57%
4	Jan 27-31	Tutorial 3	Climate change and data part 2 <i>*Bring a laptop if you have one</i>	Individual Assignment worth 3.57%
5	Feb 3-7	Tutorial 4	Misconceptions of climate change	Group Assignment worth 3.57%
6	Feb 10-14	Tutorial 5	Life cycle analysis	Group Assignment worth 3.57%
7	Feb 17-21	Study break	No Tutorials	
8	Feb 24-28	Make-up day	No tutorials this week unless previous tutorial was missed due to inclement weather	
9	Mar 3-7	Tutorial 6	Renewable energy debates - group preparation	Individual Assignment 3.57% You must attend both Tutorial 6 and Tutorial 7 to be eligible to earn the assessment grades associated with these tutorials
10	Mar 10-14	Tutorial 7	Renewable energy debates - group debates	Group Assignment worth 3.57%
11	Mar 17-21	Tutorial 8	Climate Champion presentations	Individual Presentation worth 5%
12	Mar 24-28	Tutorial 9	Environment and human health <i>*Bring a laptop if you have one</i>	Individual Assignment worth 3.57%
13	Mar 31-Apr 3	Tutorial 10	Green building design	Group Assignment worth 3.57%

Each assignment is due at the end of the tutorial period unless otherwise specified.

What to do if you're going to miss a tutorial

If you anticipate that you will be unable to attend one of your tutorials, please contact Dr. Arnott via email and submit a Student Declaration of Absence form **before** your tutorial to receive permission to attend one of the other tutorial sections. If you're ill all week and are unable to attend an alternate tutorial time, you must contact Dr. Arnott before you miss the tutorial (see below for more details on the use of SDAs in this course). We will do our best to provide a make-up option if you are ill during your tutorial, but you can only submit two SDAs per term.

Mid-term exam

There is one in-class mid-term test worth 25% of your grade. You will have 1 hour 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 28th**. A make-up midterm exam will be held outside of class time the following week if required.

Final Exam

There will be a final exam held during the final exam period. The winter term final exam period is **April 9-26th**. 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. The exam will be a combination of multiple choice and written questions covering all material from lectures and readings. **You must receive a passing grade on the final exam in order to pass the course.** Note that, except for serious unforeseen circumstances, no make-up exam or rewrites will be offered. It is your responsibility to write the exam when it is scheduled. If you are going to miss the exam for serious unforeseen circumstances, then you must contact Dr. Gass before the scheduled final exam.

Course Policies



Statement of Respect

Students in this course are encouraged to speak up and participate during class and tutorial meetings. Students will have a diversity of individual beliefs, background knowledge, and experiences - every member of this class must show respect for each other. We value these differences and can learn from them. The goal of our class discussions is to hear from as many different students as possible. I will offer various ways for you to contribute to our class learning experiences including small group discussions, traditional hand raising for whole class discussions, writing responses on the white board, and interactive in-class polling software. You are encouraged to participate in ways that you are comfortable with and to consider pushing yourself beyond your comfort zone. Engaging with the material in class and in tutorials will help you better understand and remember it.



Policy on late assignments, extensions, and make-up tests

Missed or Late Academic Requirements due to Student Absence

Dalhousie students are asked to take responsibility for their own short-term absences (5 days or less) by contacting their instructor by 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 the final exam, quizzes, or TopHat participation.** 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 in advance of the due date.**

Policy on Academic Integrity

Students will often be asked to work together during the tutorial sessions, but unless specifically stated in the assignment instructions, the final work that is submitted must be your own. Work that appears to come from elsewhere may be subjected to the plagiarism detection software URKUND.

You will find that your tutorial assignments will be based on work that you or your group have completed during the tutorial sessions and answers to the questions may vary for every student/group depending on the outcome of their tutorial exercise. You will find that the use of AI generative tools will not be helpful to these assignments because of the individual and specific nature of each assignment. You may not submit any work generated by an AI program as your own. You may use AI-driven tools to assist your learning, but you may not use them to produce work to be submitted for evaluations.

Any plagiarism or other form of cheating will be dealt with severely under relevant Dalhousie University policies.



Letter grade conversion system

Evaluation will be completed and expressed in raw marks throughout the course and will be posted on Brightspace. Letter grades will be assigned only to the final distribution of marks for the course.

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)	

University Policies and Statements



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 at 1321 Edward St or elders@dal.ca. Additional information regarding the Indigenous Student Centre can be found at: https://www.dal.ca/campus_life/communities/indigenous.html

Internationalization

At Dalhousie, 'thinking and acting globally' enhances the quality and impact of education, supporting learning that is "interdisciplinary, cross-cultural, global in reach, and orientated toward solving problems that extend across national borders." Additional internationalization information can be found at: <https://www.dal.ca/about-dal/internationalization.html>

Academic Integrity

At Dalhousie University, we are guided in all our work by the values of academic integrity: honesty, trust, fairness, responsibility, and respect. As a student, you are required to demonstrate these values in all 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. Additional academic integrity information can be found at: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Student Accessibility Centre is Dalhousie's centre of expertise for matters related to student accessibility and accommodation. If there are aspects of the design, instruction, and/or experiences within this course (online or in-person) that result in barriers to your inclusion, please contact the Student Accessibility Centre (https://www.dal.ca/campus_life/academic-support/accessibility.html) for all courses offered by Dalhousie with the exception of Truro. For courses offered by the Faculty of Agriculture, please contact the Student Success Centre in Truro (<https://www.dal.ca/about-dal/agricultural-campus/student-success-centre.html>)

Conduct in the Classroom – Culture of Respect

Substantial and constructive dialogue on challenging issues is an important part of academic inquiry and exchange. It requires willingness to listen and tolerance of opposing points of view. Consideration of individual differences and alternative viewpoints is required of all class members, towards each other, towards instructors, and towards guest speakers. While expressions of differing perspectives are welcome and encouraged, the words and language used should remain within acceptable bounds of civility and respect.

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 (Strategic Priority 5.2). Additional diversity and inclusion information can be found at:

<http://www.dal.ca/cultureofrespect.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. The full Code of Student Conduct can be found at: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Fair Dealing Policy

The Dalhousie University Fair Dealing Policy provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at Dalhousie. Additional information regarding the Fair Dealing Policy can be found at:

https://www.dal.ca/dept/university_secretariat/policies/academic/fair-dealing-policy-.html

Originality Checking Software

The course instructor may use Dalhousie's approved originality checking software and Google to check the originality of any work submitted for credit, in accordance with the Student Submission of Assignments and Use of Originality Checking Software Policy. Students are free, without penalty of grade, to choose an alternative method of attesting to the authenticity of their work and must inform the instructor no later than the last day to add/drop classes of their intent to choose an alternate method. Additional information regarding Originality Checking Software can be found at:

https://www.dal.ca/dept/university_secretariat/policies/academic/student-submission-of-assignments-and-use-of-originality-checking-software-policy-.html

Student Use of Course Materials

Course materials are designed for use as part of this course at Dalhousie University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as books, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law. Copying this course material for distribution (e.g. uploading to a commercial third-party website) may lead to a violation of Copyright law.

Faculty of Science

Student Resources and Support

University Policies and Programs

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

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

Classroom Recording Protocol:

https://www.dal.ca/dept/university_secretariat/policies/academic/classroom-recording-protocol.html

Dalhousie Grading Practices Policies:

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

Grade Appeal Process: https://www.dal.ca/campus_life/academic-support/grades-and-student-records/appealing-a-grade.html

Sexualized Violence Policy: https://www.dal.ca/dept/university_secretariat/policies/health-and-safety/sexualized-violence-policy.html

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

Learning and Support Resources

General Academic Support – Advising (Halifax): https://www.dal.ca/campus_life/academic-support/advising.html

General Academic Support – Advising (Truro): <https://www.dal.ca/about-dal/agricultural-campus/ssc/academic-support/advising.html>

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

On Track (helps you transition into university, and supports you through your first year at Dalhousie and beyond): https://www.dal.ca/campus_life/academic-support/On-track.html

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

Indigenous Connection: <https://www.dal.ca/about-dal/indigenous-connection.html>

Elders-in-Residence (The Elders in Residence program provides students with access to First Nations elders for guidance, counsel, and support. Visit the office in the Indigenous Student Centre or contact the program at elders@dal.ca or 902-494-6803:

<https://cdn.dal.ca/content/dam/dalhousie/pdf/academics/UG/indigenous-studies/Elder-Protocol-July2018.pdf>

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

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

South House Sexual and Gender Resource Centre: <https://southhousehalifax.ca/about/>

LGBTQ2SIA+ Collaborative: <https://www.dal.ca/dept/vpei/edia/education/community-specific-spaces/LGBTQ2SIA-collaborative.html>

Dalhousie Libraries: <http://libraries.dal.ca/>

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

Dalhousie Student Advocacy Services: <https://www.dsu.ca/dsas?rq=student%20advocacy>

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

Human Rights and Equity Services: <https://www.dal.ca/dept/hres.html>

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

Study Skills/Tutoring: http://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html

Faculty of Science Advising Support: <https://www.dal.ca/faculty/science/current-students/undergrad-students/degree-planning.html>

Safety

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

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

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

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