Climate Change Syllabus

Department of Physics & Atmospheric Science

PHYC/OCEA/GEOG 2800 Fall 2025

Dalhousie University operates in the unceded territories of the Mi'kmaw, Wolastoqey, and Peskotomuhkati Peoples. These sovereign nations hold inherent rights as the original peoples of these lands, and we each carry collective obligations under the Peace and Friendship Treaties. Section 35 of the Constitution Act, 1982, recognizes and affirms Aboriginal and Treaty rights in Canada.

We recognize that African Nova Scotians are a distinct people whose histories, legacies, and contributions have enriched the part of Mi'kma'ki known as Nova Scotia for over 400 years.

Course Instructor(s)

Name	Email	Office Hours
Christiane Zoghbi	christiane.zoghbi@dal.ca	F 9:00 - 11:00 Or by appointment LSC, 3rd Floor, Room 3085
Nicole Chisholm Phillipe Gauvin-Bourdon Harrison Ward	Nicole.Chisholm@dal.ca Phillipe.Gauvin-Bourdon@dal.ca harrison.ward@dal.ca	TBA

Course Description

The workings of the Earth's climate system are examined and then applied to help understand contemporary climate change. The role of numerical climate models is discussed with the aim of interpreting climate change projections for the coming decades. Finally, the impacts of climate change are studied with a focus on the various mitigation and adaptation strategies needed.

Course Prerequisites

None. The science needed to understand climate change will be presented in the lectures

Course Exclusions

ECON 2850, PHYC 2850

Student Resources

Teaching assistants will be available during their office hours to discuss any questions regarding the lecture content. Office hours and contact details for teaching assistants will be shared with students on Brightspace.

Course Structure

Course Delivery

In-person lectures. No recordings will be made available.

Lectures

M, W, F 12:35-1:25 pm Studley CHEMISTRY 125

Laboratories

None

Tutorials

None

Course Materials

- All course material will be posted on the Brightspace course website.
- Suggested textbook
  - Introduction to Modern Climate Change by Andrew E. Dessler, 3rd Edition Cambridge University Press, 2022, ISBN 978-1-108-79387-2
  - IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, In press, doi:10.1017/9781009157896. (available online: https://www.ipcc.ch/report/ar6/wg1/)

Assessment

Semester grades are based on:

- 40% Assignments
- 25% Midterm
- 35% Final Exam

Assignments (6 total - will drop lowest grade - 8% each)

Assignment	Due Date	Assignment	Due Date
1	Oct 10	4	Oct 31
2	Oct 17	5	Nov 28
3	Oct 24	6	Dec 5

Final exam

The final exam (35% of final grade) will be held during the exam period and will be scheduled by the Registrar.

Midterm exam

The midterm exam (25% of the final grade) will be held on **Wednesday, November 5,** in class (duration: 45 minutes). *If the grade for the final exam is higher than for the midterm exam, the final exam grade will be weighted 60%.*

Conversion of numerical grades to final letter grades follows the Dalhousie Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A (85-89)	B (73-76)	C (60-64)	F (0-49)
A- (80-84)	B- (70-72)	C- (55-59)	

Course Policies on Missed or Late Academic Requirements

1. Assignments submitted late and without an approved extension will be deducted 10% per day.
2. Missed assignments: if you do not complete an assignment, your mark on the assignment is zero.
3. Missed midterm: there will be no make-up midterm. If you miss your exam due to illness, family emergency, or other acceptable reason, the final exam will have a higher value (60%).

4. A make-up date will be scheduled for the final exam, which may take place either before or after the semester break (i.e. January). As per University regulations, you may only write the make-up exam under exceptional circumstances:
"A student requesting an alternative time for a final examination will be granted that request only in exceptional circumstances. Such circumstances include illness (with a medical certificate) or other mitigating circumstances outside the student's control, including technology failure in the case of online examinations." For the full text, refer to the Undergraduate Academic Calendar 2025/2026: Policy for the Scheduling of Courses/Examinations

Course Policies related to Academic Integrity

All submitted work must be done by individual students without collaboration.

Where possible, plagiarism software will be used to identify cases of copying work from uncited sources.

Feel free to use AI-driven tool to assist you in learning but remember that the objective is for you to acquire these competencies and outcomes in this course. You are responsible for all work that you produce, whether assisted by an AI-driven tool or not. You must acknowledge all tools used to assist you. If applicable, you must provide links to chat logs. If the work that you produce is suspected to misrepresent your own competencies, you may be asked to complete a supplemental assessment to evaluate your mastery of course outcomes.

Learning Objectives

After completing the course, students are expected to:

- understand the basic science explaining the causes of climate change,
- be able to interpret climate projections and their impacts,
- assess climate mitigation and adaptation pathways,
- understand relevance of uncertainty quantification for climate policy

Course Content

Below is a list of lecture topics along with an approximate schedule of their delivery.

Week	Date	Lesson Topic(s)	Assessment
1	Sep 22-26	Introduction and Evidence of Climate Change	
2	Sep 29 - Oct 3	Radiation and Energy Balance	
3	Oct 6-10	Regional climate and GHG	Assignment 1
4	Oct 13-17	Carbon Cycle	Assignment 2
5	Oct 20-24	Methane and nitrous oxide	Assignment 3
6	Oct 27-31	Hydrological cycle/Clouds and aerosols	Assignment 4
7	Nov 3-7	Climate feedbacks	MIDTERM
	Nov 10-16	Study Break	
8	Nov 17-23	Climate feedbacks / Climate models	
9	Nov 24-30	Climate projections / Climate impacts	Assignment 5
10	Dec 1-5	Climate impacts / Mitigation policies	Assignment 6
11	Dec 8-12	1.5 Warning Limit	

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 Mi'kmaq and Indigenous Relations (including the Elders in Residence program, Land Acknowledgements, Understanding Our Roots, and much more) can be found at: https://www.dal.ca/about/mission-vision-values/mikmaq-indigenous-relations.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/mission-vision-values/global-relations.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/campus_life/ssc.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: https://www.dal.ca/about/mission-vision-values/equity-diversity-inclusion-and-accessibility/about-office-equity-inclusion.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/content/dam/www/about/leadership-and-governance/governing-bodies/code-student-conduct.pdf

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/content/dam/www/about/leadership-and-governance/university-policies/fair-dealing-policy.pdf

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.