

Climate Change Syllabus

Department of Physics & Atmospheric Science

PHYC/OCEA/GEOG 2800 Fall 2026

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
Quan Dau, PhD, EIT	Dau.Quan@novascotia.ca	By appointment
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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

The course instructor will be available during their office hours to discuss any questions regarding the lecture content and/or assignments. If there are any specific questions, students are advised to arrange an appointment with the instructor ahead of time.

Course Structure

Course Delivery

In-person. Lectures will not be recorded. Students are expected to attend all classes in person. If unable to attend, use the student declaration of absence form. For extended absences, contact the instructor and the Assistant Dean of Student Affairs.

Lectures

M, W, F 10:30-11:30 am Kenneth C Rowe Management Building, Room 1028.

Laboratories

This course does not have scheduled labs or tutorials. Assignments are lab-like in content but are completed at your own time and location using materials distributed on Brightspace

Course Materials

Course slides, assignment materials, and required readings are posted on Brightspace. You must submit your assignments to Brightspace as a PDF format file by midnight on the due date.

Suggested textbook and Recommended Online Resources:

- Dessler, A. E. 2022. Introduction to Modern Climate Change, 3rd Edition. Cambridge University Press. DOI: <https://doi.org/10.1017/9781108879125>.
- Letcher, T.M. 2021. Climate Change: Observed Impacts on Planet Earth, 3rd Edition. Elsevier. DOI: <https://doi.org/10.1016/C2019-0-01498-7>
- IPCC. 2023. Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report. <https://www.ipcc.ch/report/sixth-assessment-report-cycle>
- 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. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, In press, DOI: <https://doi.org/10.1017/9781009157896>
- UNDP, 2024. Climate Box Textbook. <https://climate-box.com/toolkit/textbooks/>

- Government of Canada. Canada in a Changing Climate: Synthesis Report, 2023. <https://changingclimate.ca/synthesis>
- ClimateData.ca. Canadian climate-data portal and Learning Zone. <https://climatedata.ca>

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.

Assessment

The assignments, midterm exam, and final exam contribute to your final grade as specified below:

<i>Component</i>	<i>Weight (%)</i>	<i>Due Date</i>
<i>Assignments</i> <i>(2 individuals, 1 group)</i>	35	Sep 25 and Oct 16 (individual) & Nov 27 (group)
<i>Midterm (45 minutes)</i>	25	Nov 6
<i>Final Exam (45 minutes)</i>	35	TBA
<i>Attendance</i>	5	

Assignments

The assignments are lab-like in content but you complete them at your own time and place. Each assignment requires hands-on work and calculations followed by a write-up which is a high-quality technical report. All assignments must be submitted through Brightspace. E-mailed submissions will not be accepted. For group assignments, students will work with other classmates as a team and will contribute equivalently as a whole. The score will typically distribute equivalent to each member within the same group. Any member who does not make any contribution will receive zero.

Midterm exam

The midterm exam (25% of the final grade) will be held on **Nov 6, 2026**, in class (duration: 45 minutes). If the midterm is missed for an approved reason, there will be no make-up midterm and the final exam will count for 60% of the final grade.

Final exam

The final exam (35% of final grade) will be held during the exam period and will be scheduled by the Registrar. Students who missed final exam will receive zero points.

Attendance

Attendance will be conducted through instructor' checking application after each class. Students can check in by scanning the QR code on the class screen, either in their electronic device such as mobile phone, or via computer-based with an accessible link. The link will only be activated during 5 minutes of the checking time. Checking before and after the activating session will be blocked by the system.

Conversion of numerical grades to final letter grades follows the **undergraduate***

Dalhousie Grade Scale

(*for graduate courses, be sure to include the graduate 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

Assignments submitted late and without an approved extension will be deducted 10% per day.

- Missed assignments: if you do not complete an assignment, your mark on the assignment is zero.
- 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%).
- 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 2026/2027: [Policy for the Scheduling of Courses/Examinations](#)

Course Policies related to Academic Integrity & Artificial Intelligence

Collaboration is an important part of learning; however, students are expected to maintain academic integrity in all course work.

Individual Assignments: Unless otherwise specified, all individual assignments must be completed independently. Students may discuss course concepts, theories, and assignment requirements with classmates, but the submitted work must be their own. Students may not share completed assignments, solutions, drafts, or substantive written work with other students.

Group Assignments: For assignments designated as group work, collaboration among group members is expected and encouraged. All group members are expected to contribute meaningfully to the final submission. Collaboration with individuals outside the assigned group is not permitted unless explicitly authorized by the instructor.

Students are responsible for understanding and adhering to Dalhousie University's Academic Integrity policies. Unauthorized collaboration, plagiarism, contract cheating, fabrication, falsification, and other forms of academic misconduct may result in disciplinary action.

Please note that Dalhousie University does not use plagiarism-detection software as a standard institutional service, and instructors do not use unsanctioned software or tools to investigate suspected academic integrity violations.

Use of Generative AI (Microsoft 365 Copilot Chat)

Generative artificial intelligence (AI) tools can support learning when used appropriately. In accordance with Dalhousie University guidance and Nova Scotia privacy requirements, students may only be required to use **Microsoft 365 Copilot Chat**, which is available through their Dalhousie account. The permitted uses of Copilot Chat in this course are as follows:

Activity	Permitted?
Brainstorming ideas and topics	Yes
Generating outlines or organizing content	Yes
Explaining concepts, terminology, or methods	Yes
Editing for grammar, spelling, clarity, or style	Yes
Producing complete assignment responses for submission	No
Writing substantial portions of papers, reports, reflections, or discussion posts that are submitted as the student's own work	No
Completing quizzes, tests, examinations, or other assessments intended to measure individual knowledge	No
Fabricating references, data, citations, or sources	No

Students remain fully responsible for the accuracy, quality, originality, and integrity of all submitted work, including any content developed with the assistance of generative AI.

Any use of generative AI beyond the permissions outlined above may be considered an academic integrity violation and may be subject to appropriate disciplinary and/or corrective measures.

Disclosure Requirements

If a student uses Microsoft 365 Copilot Chat in completing a course assessment, they must include a brief disclosure statement at the end of the submission. Required disclosure template:

I used Microsoft 365 Copilot Chat to assist with [describe purpose, e.g., brainstorming, outlining, editing for clarity, etc.]. All final content, analysis, conclusions, and submitted work are my own.

Citation Requirements

When Copilot Chat contributes substantive content, ideas, analysis, summaries, or wording that influence the final submission, students must acknowledge this use through an in-text citation and include a reference entry following the citation style required for the course (e.g., APA, MLA, Chicago).

Routine uses such as grammar correction, proofreading, or formatting assistance do not require formal citation but must still be disclosed if used during the preparation of the assignment.

Submission Requirements

For any assignment in which Copilot Chat is used, students must submit the following as an appendix or separate document:

- A copy of the prompts entered into Copilot Chat.
- A summary of how the tool was used during the assignment process.
- Any AI-generated content that directly informed or contributed to the final submission.

The instructor may request additional documentation of the student's process if needed to verify compliance with course requirements.

Students are encouraged to use generative AI thoughtfully, critically evaluate all AI-generated outputs, and apply their own judgment, analysis, and disciplinary knowledge in all submitted work.

Course Accessibility

Dalhousie University is committed to providing an accessible and inclusive learning environment. Students may be eligible for academic accommodations based on protected characteristics, including disability, religion, and other human rights grounds.

If religious, cultural, spiritual, or community-significant observances conflict with course requirements, please contact me as early as possible so we can work together to identify appropriate alternatives.

Students seeking formal academic accommodations should contact the **Student Accessibility Centre (SAC)** to begin the accommodation process. For more information, visit the SAC website: https://www.dal.ca/campus_life/academic-support/accessibility.html.

Course Content

Below is a list of lecture topics, along with an approximate schedule of their delivery. Note that some lesson topics may be amended at any time, depending on the study journey and other circumstances. Any changes will be communicated to the student in advance.

Week	Date	Lesson Topic(s)	Assessment
1	Sep 9-11	Introduction & Evidence of Climate Change	
2	Sep 14-18	Greenhouse Gases, Radiation & Earth Energy Balance	
3	Sep 21-25	Climate System & Sea-Level Rise	Individual Assignment
4	Sep 28-Oct 2	GIS and Spatial Analysis for Climate Change	
5	Oct 5-9	Climate Data Analytics: Historical Change and Extremes	
6	Oct 12-16	Climate Models, Scenarios & Future Projections	Individual Assignment
7	Oct 19-23	Carbon Cycle, Carbon Budget & GHG Accounting	
8	Oct 26-30	Hydrological Cycle, Clouds & Aerosols	
9	Nov 2-6	Climate Feedbacks and Tipping Processes	Mid-Term Exam
	Nov 9-13	Fall Break	
10	Nov 16-20	Climate Monitoring, Indicators & Observed Trends	
11	Nov 23-27	Climate Change Impacts, Vulnerability & Adaptation	Group Assignment
12	Nov 30-Dec 4	Mitigation, Net Zero & Climate Policy	
13	Dec 7-9	Course Review	
	To be updated		End-Term Exam

Syllabus Appendix

(Formerly University Policies and Statements)

This course is subject to the academic policies, regulations, student support services, and university guidelines outlined in Dalhousie's **Syllabus Appendix**. Students are responsible for reviewing this resource, which includes information on academic integrity, student accommodations, equity and inclusion, student supports, and other important university policies. Because these resources are maintained centrally, the Syllabus Appendix provides the most current information available.

Link to Syllabus Appendix:

[Syllabus Appendix: Student Supports & University Statements, Policies, and Guidelines](#)