

 Yukon University	School of Science GEOG 290 Climate Change and the Circumpolar World
	Term: Fall 2026 Number of Credits: 3
Course Outline	

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LECTURE: Tuesday and Thursday 9:00 – 10:20 am
LECTURE CLASSROOM: A2202

COURSE DESCRIPTION

Climate change is more dramatic in polar regions compared to other locations globally, creating unique challenges and responses for inhabitants, both human and non-human in the Circumpolar North. This course begins with an overview of knowledge frameworks, characterizing climate and climate change, paleoclimates, and evidence of climate change from multiple cultural lenses, incorporating Traditional, Indigenous, and Scientific Knowledge. Students will analyze the drivers of climate change, explain climate models, and discuss uncertainty with climate change predictions. The second half of the course will focus on current and projected impacts of climate change on the environment and ecosystems, including wildlife, geologic and weather processes, and the cumulative impacts with anthropogenic land use change, and potential changes to culture and economy. Students will also explore climate resiliency and challenges associated with adaptation possibilities and mitigation strategies.

This course is based on the Climate Change and the Circumpolar World exemplar course developed by Tara Stehelin and Tara Howatt for the Læra Institute for Circumpolar Education. The exemplar course is licensed under Creative Commons **CC-BY-SA 4.0 International**.

COURSE REQUIREMENTS

Prerequisite(s): There are no specific prerequisites for this course, however, students are expected to be at a second-year level. For example, students should have at least one semester of first-year English and one first-year Science course completed (e.g. GEOG 101). Expectations are set accordingly. Students can also discuss preparedness and obtain permission from the instructor (for example for professionals working in a related field).

EQUIVALENCY OR TRANSFERABILITY

Receiving institutions determine course transferability. Find further information at:
<https://www.yukonu.ca/admissions/transfer-credit>

LEARNING OUTCOMES

Upon successful completion of the course, students will be able to:

1. discuss and appreciate the many dimensions of climate change, including perspectives from other cultures and from Indigenous Knowledge sources from the circumpolar region,
2. describe and analyze the governing factors that define climate and climate change globally and in the circumpolar region,
3. evaluate and explain the evidence regarding climate change, both current and past, including the challenges and uncertainty of predicting climate change under multiple future scenarios,
4. examine how circumpolar environments have changed and characterize some of the challenges associated with adaptation to and mitigation of climate change impacts,
5. evaluate and explain some of the ecological responses to climate change and potential adaptation.

COURSE FORMAT

Weekly breakdown of instructional hours

This course will have two 1.5-hr lectures each week. Students are expected to keep up with assigned course readings and complete assignments as necessary outside of scheduled hours each week. Although it will vary from individual to individual, students should expect to spend 4-5 hours on course material outside of the classroom time (per week) on studying or completing assignments.

Students are expected to attend both lectures each week. If a student is absent for a lecture, they must contact the instructor and make up for the missed material on their own time.

Delivery format

This course will be delivered on campus in a face-to-face setting. Lectures will take place in a classroom (A2202).

EVALUATION

Term Project	25%
Discussions: Participant	20%
Discussions: Facilitator	15%
Self-Reflection	5%
Midterm Exam	15%
Final Exam	20%
Total	100%

Term Project

There will be one semester-long poster project. The project is designed to provide opportunities to implement and reflect on course material. In addition to the final poster, the term project will include a logbook with entries completed during class time and a poster outline to ensure students are reaching milestones and to receive feedback. Full term project details will be provided in class and on Moodle.

Discussions

There will be a number of in-class discussions. The instructor will facilitate the first discussion, and the following discussions will be facilitated by students. Each student will be responsible to facilitate one class discussion within a small group. These discussions will be based on a reading or case study and provide opportunity to students to explore research and/or events from multiple perspectives. The discussions will have a "Participant" component that involves actively preparing for the discussion and will be evaluated by a pre-discussion worksheet and an in-class quiz, and a "Facilitator" component that involves preparing a discussion outline and leading a discussion. Full discussion details will be provided in class and on Moodle.

Self-Reflection

Students will reflect on their learning and skill development in the middle and at the end of the semester.

Exams

There will be one midterm exam that will take place during class time and one final exam that will be scheduled during the exam period. Both exams will be closed book and based on the lecture and discussion material.

Late Policy

Course work is expected to be submitted on time, by the due date. Work completed outside of class time will not be accepted if the work has been graded and returned to students. No work will be accepted for grading after this point and will be assigned a grade of zero.

The term project will include a logbook with entries written in-class and serves the purpose of reaching milestones toward the final project. **No late submissions of logbook entries will be accepted.**

Discussion facilitation will occur during class and content from the pre-discussion worksheets support the discussion facilitation preparation. Therefore, **no late submissions of the pre-discussion worksheets or the discussion facilitation will be accepted.**

Extensions may be granted exceptionally and under special circumstances. Please communicate with your instructor **prior to the due date**. Once the due date has passed no extension will be granted.

COURSE WITHDRAWAL INFORMATION

The last date to withdraw without academic penalty is November 5, 2026. Refer to the YukonU website for other important dates.

TEXTBOOKS & LEARNING MATERIALS

Readings from these materials and other online resources will be assigned during the course.

- Dessler, A. E., 2021. An Introduction to Modern Climate Change 3rd Edition. Cambridge University

Press.

- The textbook is available from the bookstore (physical copy) or from Cambridge University Press (e-text).
- Arctic Report Card: <https://arctic.noaa.gov/report-card/>
- Intergovernmental Panel on Climate Change Reports e.g.: <https://www.ipcc.ch/report/sixth-assessment-report-cycle/>

ACADEMIC INTEGRITY

Students are expected to contribute toward a positive and supportive environment and are required to conduct themselves in a responsible manner. Academic misconduct includes all forms of academic dishonesty such as cheating, plagiarism, fabrication, fraud, deceit, using the work of others without their permission, aiding other students in committing academic offences, misrepresenting academic assignments prepared by others as one's own, or any other forms of academic dishonesty including falsification of any information on any Yukon University document.

Please refer to Academic Regulations & Procedures for further details about academic standing and student rights and responsibilities.

Note that generative artificial intelligence tools such as Chat GPT can be useful in the same way as a web search or Wikipedia: they can be a starting point but cannot be used to do the work for you. Simply copying the output from something like Chat GPT and submitting it as your own work will be considered plagiarism the same as if you copied directly from a book, webpage, or classmate. Furthermore, appropriate referencing is expected in submitted work. If generative AI is used as part of your writing workflow, this must be indicated either as a footnote or endnote describing the use/purpose of the AI. Please be aware that generative AI cannot be used as a reference source itself. Chat GPT and similar tools are not actual sources of information and should not be referenced as such, much as you would not reference the results of a web search. References should be to the published scientific literature, or, when appropriate, to the popular scientific media.

ACCESSIBILITY AND ACADEMIC ACCOMMODATION

Yukon University is committed to providing a positive, supportive, and barrier-free academic environment for all its students. Students experiencing barriers to full participation due to a visible or hidden disability (including hearing, vision, mobility, learning disability, mental health, chronic or temporary medical condition), should contact Accessibility Services for resources or to arrange academic accommodations: access@yukonu.ca.

TOPIC OUTLINE

A detailed schedule with due dates will be provided to students during the first lecture. Topics that will be covered in this course include:

Topic outline may be altered at any point at the discretion of the instructor

Week	Date	Module	Lecture Topics
1	Sept 1	Introduction to Climate Change in the Circumpolar World	Introduction to Climate Change and the Circumpolar World
	Sept 3		Climate Change Knowledge
2	Sept 8	Understanding the Climate System	Essentials of Radiation on Earth
	Sept 10		Global Energy Balance I
3	Sept 15		Introduction to Discussions
	Sept 17		<i>Discussion #0</i>
4	Sept 22		Discussion Work Day
	Sept 24		Global Energy Balance II
5	Sept 29		The Carbon Cycle and Greenhouse Gases
	Oct 1		Climate Forcing and Feedbacks
6	Oct 6	Climate Modelling	Climate Models and Projections
	Oct 8		Midterm Exam
7	Oct 13		Reading Week (No Class)
	Oct 15		
8	Oct 20	Environmental Responses to Climate Change	Climate Change and the Atmosphere I
	Oct 22		Climate Change and the Atmosphere II
9	Oct 27		Climate Change and the Oceans
	Oct 29		<i>Discussion #1</i>
10	Nov 3		Ocean Acidification
	Nov 5		Climate Change and the Cryosphere
11	Nov 10		Climate Change Mitigation
	Nov 12		<i>Discussion #2</i>
12	Nov 17	Ecosystem Responses to Climate Change	Ecological Responses to Climate Change
	Nov 19		Climate Change and Extinction
13	Nov 24		Modeling the Ecological Impacts of Climate Change on Species
	Nov 26		<i>Discussion #3</i>
14	Dec 1	Looking Forward	Climate Action
	Dec 3		<i>Term Project Celebration</i>
Final Exam: Thursday December 10 9:00am – 12:00pm A2202			