Yukon University	**School of Science** **GEOG 290** **Climate Change and the Circumpolar World**
	Term: Fall 2025 **Number of Credits: 3**

Course Outline

INSTRUCTOR: Tara Howatt, PhD
E-MAIL: thowatt@yukonu.ca
OFFICE: A2303b, office hours by appointment

LECTURE: Tuesday and Thursday 5:30 – 6:50 pm
LECTURE CLASSROOM: A2204

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.

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 (A2204).

EVALUATION

Assignments	30%
Discussions: Participant	15%
Discussions: Facilitator	15%
Midterm Exam	15%
Final Exam	25%
Total	**100%**

Assignments
There will be three assignments in this course. Each assignment will be worth 10% of the final grade. The assignments are designed to provide opportunities to practice course material and to receive feedback.

Discussions

There will be five 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 asking questions and writing reflections and a "Facilitator" component that involves preparing a discussion outline, leading a discussion, and a self-evaluation. Full discussion details will be provided in class and on Moodle.

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

A late penalty of 10% per day will be applied to assignments, discussion outline, discussion reflections, and discussion self-evaluations when submitted after the due date. Students are granted a one-time late submission for assignment submissions, no penalty, no questions asked. Students must hand in work one week after the due date, *before* the graded work is returned to students. Late submissions of the discussion outline will be accepted only until the Thursday before the student's scheduled discussion facilitation. No work will be accepted for grading after this point and will be assigned a grade of zero.

Discussion facilitation will occur during class and pre-discussion questions support the discussion facilitation preparation. Therefore, **no late submissions of pre-discussion questions or the discussion facilitation will be accepted.** The one-time late submission does not apply to these activities.

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 October 31, 2025. 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 Topic
1	Sept 4	Introduction to Climate Change in the Circumpolar World	Introduction to Climate Change and the Circumpolar World
2	Sept 9		Climate Change Knowledge
	Sept 11		Introduction to Discussions
3	Sept 16		*Discussion #0*
	Sept 18		Discussion Work Day
4	Sept 23	Understanding the Climate System	Essentials of Radiation on Earth
	Sept 25		The Global Energy Balance
5	Sept 30		**National Day for Truth and Reconciliation (No Class)**
	Oct 2		The Carbon Cycle and Greenhouse Gases
6	Oct 7		Climate Forcing and Feedbacks
	Oct 9		*Discussion #1*
7	Oct 14		**Reading Week (No Class)**
	Oct 16		
8	Oct 21		Midterm Review
	Oct 23		**Midterm Exam**
9	Oct 28	Climate Modelling	Climate Models and Projections
	Oct 30		*Discussion #2*
10	Nov 4	Environmental Responses to Climate Change	Climate Change and the Atmosphere
	Nov 6		Climate Change and the Oceans
11	Nov 11		**Remembrance Day (No Class)**
	Nov 13		Ocean Acidification
12	Nov 18		Climate Change and the Cryosphere
	Nov 20		*Discussion #3*
13	Nov 25	Ecosystem Responses to Climate Change	Ecological Responses to Climate Change (Wildlife & Vegetation)
	Nov 27		Climate Change and Extinction
14	Dec 2		Modeling the Ecological Impacts of Climate Change on Species
	Dec 4	Looking Forward	*Discussion #4*
15	Dec 9		Human Responses to Climate Change & Climate Leadership
	Dec 10		Semester Review