

# Ecological Consequences of Climate Change

## Course description

Climate change is one of the most important and complex challenges facing us today. This course examines ecological consequences of climate change across temporal and spatial scales. We will take a variety of approaches to better understand the ecosystem responses of climate change including in-depth discussions to contextualize these responses. **Also, we will be skyping in climate change research experts from around the world to discuss real research related issues and challenges.**



We are meeting and learning on the traditional territories of the Haunenosaaunee, Anishinabek and the Neutral



## Important info



**Prof:** Dr. Andrew Trant

**Email:** atrant@uwaterloo.ca

**Student hours:** Th 12:30-1:30pm, EV2-2026

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# Requirements

No text for this class so you *have to come to class!*

## Resources

Lectures

Journal articles

Guest Speakers

Hands-on

## The intent

I see that the learning that will occur in this course will happen in many different directions. I want you to learn from me and I want to learn from you. We all bring such varied perspectives to the conversation. Journal articles, guest speakers and other forms of media will also help us distill ideas and provide essential resolution to our ideas. Knowledge, like landscapes, changes across space and through time.

## Objectives

By the end of this course, you should be on a path to life-long learning as an **ecologically-literate citizen and well-versed in ecological consequences of climate change**. More specifically, you should be able to do the following (our course learning outcomes):

**identify** and **explain**, with examples, the main principles of ecology from a variety of perspectives and across a variety of scales;  
**demonstrate** how these principles and concepts apply to real-world situations ;  
**analyze** the elements of climate change science; and  
**evaluate** how we communicate and understand the ecological consequences of climate change.

**These course learning outcomes will not only prepare you to be an informed citizen and member of the community of life on earth, but also provide the basis for knowledge, humility, and wisdom in your dealings with ecological problems in your daily life and eventual career.**

# Assessment

## meetings: 5%

**#1 (2%):** To discuss potential topics for your final paper. Must bring 3 ideas printed out for me to keep.

**#2 (3%):** Go over your paper outline. Must bring an outline of your paper.

## assignment 1: 10%

This assignment will revolve around working with ideas of paleoclimate and historical climate data. More information will be given in the second week of class. (in-class Jan 23, due Jan 30<sup>th</sup>)

## paper

## presentations: 10%

In pairs, present a 3-minute lay summary and 12-minute discussion/activity on the assigned paper. Be creative but make sure your discussion keeps to the focus of your paper.

## group

## presentations: 15%

In groups of 3, selected by me based on paper topics, you will give a 20 min presentation to the class. A rubric will be provided.

100  
**your mark**

## final paper: 25%

A 10 well-referenced pages that explains and discusses the problem, scientific background of your topic, and proposed solutions. You are encouraged to include figures and tables to make your paper compelling. **This might sound obvious but pick a topic that you are interested in and run with it.**

## assignment 2: 10%

Working with the idea of climate change experiments, groups of 4 will brainstorm ways of testing different climatic factors during class and then informally present findings to the class. *It is also essential to bring your brains to this classes on Feb 6<sup>th</sup> and 13<sup>th</sup>.*

## final exam: 25%

There will be an in-class exam near at end of the semester. We will have plenty of time throughout the semester to discuss my approach and philosophy for testing. The content for this exam will be taken from the lectures and readings, with an emphasis placed on concepts, rather than details, and to demonstrate your ability to think critically about issues of climate change. (April 2<sup>nd</sup>)

**Late penalties on final papers will be 10% per day**

# Policies & resources

This syllabus is a contract between us, so you must abide by the policies and schemes laid out here (as will I, for my part). If you have any questions or concerns, please speak with me as soon as possible.

## Academic integrity and offences

In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. CLICK [HERE](#)

You are expected to know what constitutes academic integrity, to avoid committing academic offences, and to take responsibility for your actions. If you are unsure whether an action constitutes an offence, or need help in learning how to avoid offences (e.g., plagiarism, cheating) or about “rules” for group work/collaboration, please complete the [tutorial](#) and seek guidance from the course professor, your Undergraduate Advisor, or the office of the Associate Dean – Undergraduate. When misconduct has been detected, disciplinary penalties will be imposed under [Policy 71 – Student Discipline](#).

For information on categories of offences and types of penalties, refer to Policy 71. Within the Faculty of Environment, those committing academic offences (e.g. cheating, plagiarism) will be placed on disciplinary probation and will be subject to penalties that may include a grade of 0 on affected course elements, 0 on the course, suspension, and expulsion.

If you believe that a decision affecting some aspect of your university life has been unfair or unreasonable, you may have grounds for initiating a grievance; see [Policy 70 – Student Petitions and Grievances, Section 4](#).

When in doubt please contact your Undergraduate Advisor for details. A decision made or penalty imposed under Policy 70 or Policy 71 may be appealed if there is a ground (see [Policy 72 – Student Appeals](#)).

## Attendance and preparation

You are strongly encouraged to attend class meetings because they will be interactive in nature and develop the course material. Thus, please come to class prepared to discuss and engage.

## AccessAbility

AccessAbility Services (click [HERE](#) for info), located in Needles Hall—Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AccessAbility Services at the beginning of each academic term.

## Availability for exams

Supplemental exams are only set for those with medical or similar problems. You are expected to be present for scheduled examinations, so please see the course schedule (above) for the midterm exam and consult UW’s final examination timetable before making travel plans. No “make up” examinations are provided to accommodate you for leaving campus early. For the UW policy on exams, go [HERE](#)

## Definition of grades

Please click [HERE](#) to see the following link for descriptions of the standards required for different grades.

## Digital distraction

Recent research has demonstrated that students cannot focus effectively on classroom activities and discussions if others around them are using laptops or electronic devices—and their grades, as well as those of their classmates, suffer (e.g., Fried 2008; Taneja *et al.* 2015). Accordingly, *please turn your cell phone off before class*. Further, this course involves extensive oral and listening participation, in addition to note-taking, so laptops will not be used regularly during class. Therefore, *I request that those of you who must use a laptop sit in the back half of the class*. If you have a special learning need that requires a laptop and sitting closer to the front of the room, please document it with AccessAbility Services and we will find an agreeable solution.

*tip:*

If you are having any trouble, come see me ASAP. Don't wait.

# Policies & resources

Continued from last page

## Mental health

Along with the University of Waterloo and the Faculty of Environment and its Departments, I consider your well-being to be extremely important. We recognize that many students face health challenges, physical and/or emotional. *Please note that help is available.* Mental health is a serious issue for everyone and can affect your ability to do your best work. [Counselling Services](#) is an inclusive, non-judgmental, and confidential space for anyone to seek support. They offer confidential counselling for a variety of areas including anxiety, depression, grief, relationship issues, sexuality, stress management, substance use, and much more.

## Religious observances

Please email me at the beginning of term if you require special accommodation for religious observances that are not otherwise accounted for in the scheduling of classes and assignments.

*tip:*

Come to student hours!  
Your mark will reflect the  
added effort!

## Unclaimed assignments

Unclaimed assignments will be retained until one month after term grades become official in Quest. After that time, they will be destroyed in compliance with UW's confidential shredding procedures.

## Writing

The Writing Centre works across all faculties to help students clarify their ideas, develop their voices, and write in the style appropriate to their disciplines. Writing Centre staff offer one-on-one support in planning assignments and presentations, using and documenting research, organizing and structuring papers, and revising for clarity and coherence. You can make multiple appointments throughout the term, or drop in at the Library for quick questions or feedback. To book a 50-minute appointment and to see drop-in hours, click [HERE](#). Group appointments for team-based projects, presentations, and papers are also available. Please note that writing specialists guide you to see your work as readers would. They can teach you revising skills and strategies, but will not proof-read or edit for you. Please bring hard copies of your assignment instructions and any notes or drafts to your appointment.

## References

Fried, C. B. (2008). In-class laptop use and its effects on student learning. *Computers & Education* 50: 906–914.  
Taneja, A., Fiore, V. and Fischer B. (2015). Cyber-slacking in the classroom: Potential for digital distraction in the new age. *Computers & Education* 82: 141-151.

# Schedule

FACULTY OF ENVIRONMENT  
ERS 431

Week	Day	Topic	Important details	Deadlines
1	Jan 7	Introduction & overview	Sign-up for presentations/meetings	
	Jan 9	Climate change – patterns & drivers		
2	Jan 14	Climate change – predictions		
	Jan 16	<b>Individual meetings #1</b>		Worth 2%
3	Jan 21	Paleoclimate I	2 paper presentations	
	Jan 23	Paleoclimate II	Important in-class assignment	
4	Jan 28	Life history and phenology I	2 paper presentations	
	Jan 30	Life history and phenology II	2 paper presentations	Assignment 1 due (10%)
5	Feb 4	Experiments	2 paper presentations	
	Feb 6	Experiments (group work)		
6	Feb 11	<b>Individual meeting #2</b>		Worth 3%
	Feb 13	Experiments (presentations)		Assignment 2 (10%)
7	Feb 18	<b>READING WEEK</b>		
	Feb 22			
8	Feb 25	Population responses and range dynamics	2 paper presentations	
	Feb 27	Group work		
9	Mar 3	Range dynamics II	2 paper presentations	
	Mar 6	Community and ecosystem responses	2 paper presentations	
10	Mar 10	Community and ecosystem responses	2 paper presentations	
	Mar 12	Communicating/alternative perspectives	2 paper presentations	
11	Mar 17	Communicating/alternative perspectives		Final papers due by midnight
	Mar 19	Group presentations (x3)		
12	Mar 24	Group presentations (x3)		
	Mar 26	Group presentations (x3)		
13	Mar 31	Group presentations (x3)		
	Apr 2	<b>EXAM</b>		