

University of Waterloo
Department of Geography and Environmental Management

GEOG 309 – “PHYSICAL CLIMATOLOGY:
THE PHYSICAL BASIS OF ATMOSPHERIC PROCESSES”
Dr. Yuri Leonenko

Winter 2019
T Th: 11:30 - 12:50
Lecture Room: EV3 room 1408

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Office Hours: Tuesday 13:30 to 15:00

COURSE OBJECTIVES:

Upon completion of this course, each student will be able to discuss the following:

- 1/ How do the fundamental geographical processes explain my daily experience of weather and climate?
- 2/ What is the impact of my daily activities on regional and global climate change and variability?
- 3/ What is my effective contribution to issues presented in the public and professional debate on climate change and variability?
- 4/ How can I explain my understanding of the issues of climate change and variability ideas to others with confidence and persuasion?

COURSE DESCRIPTION:

In this course, a conceptual model of the climate system that includes the human dimensions is presented. The climate system is defined as the atmosphere and its interaction with the ocean, ice and land surfaces. The concepts of feedbacks and thresholds as they relate to this system are introduced and the significance of the points of human leverage is discussed. Subsequently, individual components of the system are examined in detail. The objective is to have a clear understanding of how the various components of the climate system interact and how humans are in a position to become a major force in the process flows within this system. Current climate topics such as global warming, El Niño, La Niña, and their effect on the Canadian climate are discussed throughout the course.

COURSE RESOURCES:

Aguado, E., Burt J. E., 2010 (Seventh edition, earlier editions may be available and are acceptable), *Understanding Weather and Climate*, Pearson, 596 pages.

There is a web-learning site available with purchase but not necessary.

This is an expensive book but the best for this class. There is a Kindle version and time sensitive versions available as e-books and used versions available for lower prices. Any edition is good but the page numbers in the outline will not be correct for other editions than the fifth and seventh.

Note that there will be interactive quizzes in class using the ‘I-clicker’ to be purchased from the bookstore or available from previous classes. Individual ‘I-clickers’ are registered to each student.

COURSE STRUCTURE AND EVALUATION:

Course Learning Outcomes/goals	Teaching and Learning Methods	Assessment Methods	% grade
Understand physical processes of climate and weather	Lectures and Text readings	Iclicker tests	25
		Participation Marks	5
		Two Mid-terms	30
Analysis of Daily Weather events during the course	Daily Weather Briefing	Analysis of Sequence of Weather Maps in Class Workshop as groups of four and explain the sequence and processes of weather in Southern Ontario	10
Assess role of weather on personal daily activity	“GEO-WIKI”	Photography app completion	15
Assess public debate on Climate Change and Variability	Newsfeeds	Group discussion on Learn	15

PLEASE NOTE:

Missing Assignment and Examinations: If you miss an exam due to a valid medical reason, personal or family emergency, etc., contact me immediately, and promptly obtain a University of Waterloo medical or counselor's note explaining the reason for your absence, degree of incapacitation, dates covered by the note, etc. Please provide the original of the note to me in person. I need the ORIGINAL copy. Do **NOT** have another person deliver it and do not slip it under my office door where it may be dislodged by cleaners and never found again!

Typically, a missed test is made up by an essay with a topic that I determine which covers material covered in class lectures and the textbook readings. It is to be completed within 5 days. The note does **NOT** guarantee such an alternative arrangement! The arrangement may only be provided based upon my judgment of the situation.

Also note, only ONE missed test, even with a valid medical or counselor's note, will be accommodated with such an alternative arrangement. The second or successive test missed will result in a zero for the examination. This applies to the mid-terms.

No alternative arrangements are made for missed I-clicker tests or other assignments.

Examinations: It is the student's responsibility to be available to write exams in the scheduled times. The two midterm exams will be held in class during the lecture period. The exams are mandatory, and no alternative exam dates are possible.

In class quizzes:

Note that there will be interactive quizzes in class using the 'I-clicker' to be purchased from the bookstore. Individual 'I-clickers' are registered to each student. *Use of an I-clicker registered to another student is cause for disciplinary action under policy 71 (see note below)*. Individual I-clickers must be registered for the course on the Learn website for Geography 309. Instructions will be provided. If registered for another course, it will **NOT** be transferred to this course automatically. Note that purchase of an I-clicker is a course requirement and it is the student's responsibility to ensure that it works correctly.

Documentation on the I-clicker is available at:

<https://uwaterloo.ca/information-systems-technology/services/student-response-systems/common-iclicker-questions>

There will be marked quizzes and unmarked quizzes and all quizzes will be administered at the beginning of class.

The *unmarked quizzes* will help you gauge your learning and preparation throughout the course. They will have the same format as the marked quizzes. **The Dates for the Unmarked Quizzes are on the Lecture Schedule.**

The *marked quizzes* will be a series of five tests graded out of a total of 25 marks using the I-clicker system. These will be multiple-choice of ten questions, each worth ½ mark. **The Dates for the Marked Quizzes are on the Lecture Schedule.** Each quiz with more than 7 of the 10 questions answered will get 1 participation mark in addition to the grade out of 5. This means that if you are late you may miss questions and may not get the participation mark.

Materials and announcements for the class will be found on the University's 'Desire to Learn' web site at: <http://learn.uwaterloo.ca/>
(use your WatIAM/Quest username and password)

I will post the overheads for the lectures that I give on this site in advance. I reserve the right to change the overheads during the topic, but I will tell you in class if they have been rearranged or updated. I commonly add current material or change the content and order. Students often complain about the wireless capability in the classrooms so be certain to download current content before the lectures.

The **Geo-Wiki** photo submissions, **Blog Assignment** and the **Weather Map Assignment** will be explained in class with instructions on the Learn site.

GEOGRAPHY 309 COURSE CONTENT

Week #	Date	Topic	Readings Fifth Edition	Readings Seventh Edition	Weather Assignment Due	GeoWiki Assignment Due	Blog Assignment Due	Iclicker Test
1	Jan 8	Intro: Human Dimensions of Climate Change and Variability - 1	pp 519-527	497-512				
	Jan 10	Human Dimensions of Climate Change and Variability - 2						
2	Jan 15	Radiant Energy Flow in Climate Processes-1	32-44, 59-69, 72-75	32-42, 54-71				Unmarked Iclicker Test One
	Jan 17	<i>Video: THIN ICE: The Inside Story of Climate Science</i>						
3	Jan 22	Radiant Energy Flow in Climate Processes-2					Blog One Due midnight January 23	Marked Iclicker Test One
	Jan 24	Radiant Energy Flow in Climate Processes-3				"GeoWiki" Assignment One Due Midnight Jan 25		
4	Jan 29	Convective Energy Flow in Climate Processes-1	35-36, 69-72, 77-97	35-36, 64-67, 71-89				
	Jan 31	Convective Energy Flow in Climate Processes-2						Marked Iclicker Test Two
	Feb 5	In Class Mid-Term TEST ONE						
5	Feb 7	Circulation Processes-1	101-129	90-119			Blog Two Due midnight February 8	Unmarked Iclicker Test Two

6	Feb 12	Circulation Processes-2						
	Feb 14	Video: "Arctic Circle: On Thin Ice"						
7	<hr style="border: 1px solid red;"/>							
8	Feb 26	Circulation Processes-3				"GeoWiki" Assignment Two Due Midnight February 27		Marked Iclicker Test Three
	Feb 28	Circulation Processes-4					Blog Three Due midnight March 1	
9	Mar 5	Circulation Processes-5						Unmarked Iclicker Test Three
	Mar 7	Weather Systems-1	273-295	262-285				
10	Mar 12	Weather Systems-2						Marked Iclicker Test Four
	Mar 14	Synoptic Processes-1	299-325	287-313			Blog Four Due midnight March 15	
11	Mar 19	Synoptic Processes-2						
	Mar 21	El Niño and teleconnections-						Unmarked Iclicker Test Four
12	Mar 26	Video: "The Great Warming, the Human						
	Mar 28	In Class Mid-Term TEST TWO						
13	Apr 2	Regional Climate and Weather of Southern Ontario				"GeoWiki" Assignment Three Due Midnight April 3		
	Apr 4	Climate Models and Issues of Climate Change for Canada	497-533	474-513	Weather Assignment Due Midnight April 5		Blog Five Due midnight April 5	Marked Iclicker Test Five

The Helpful and Legal Stuff

◆ Intellectual Property

Students should be aware that this course contains the intellectual property of their instructor, TA, and/or the University of Waterloo. Intellectual property includes items such as:

- Lecture content, spoken and written (and any audio/video recording thereof);
- Lecture handouts, presentations, and other materials prepared for the course (e.g., PowerPoint slides);
- Questions or solution sets from various types of assessments (e.g., assignments, quizzes, tests, final exams); and
- Work protected by copyright (e.g., any work authored by the instructor or TA or used by the instructor or TA with permission of the copyright owner).

Course materials and the intellectual property contained therein, are used to enhance a student's educational experience. However, sharing this intellectual property without the intellectual property owner's permission is a violation of intellectual property rights. For this reason, it is necessary to ask the instructor, TA and/or the University of Waterloo for permission before uploading and sharing the intellectual property of others online (e.g., to an online repository).

Permission from an instructor, TA or the University is also necessary before sharing the intellectual property of others from completed courses with students taking the same/similar courses in subsequent terms/years. In many cases, instructors might be happy to allow distribution of certain materials. However, doing so without expressed permission is considered a violation of intellectual property rights.

Please alert the instructor if you become aware of intellectual property belonging to others (past or present) circulating, either through the student body or online. The intellectual property rights owner deserves to know (and may have already given their consent).

◆ Academic Integrity:

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. The University's guiding principles on academic integrity can be found here: <http://uwaterloo.ca/academicintegrity>. ENV students are strongly encouraged to review the material provided by the university's Academic Integrity office specifically for students: <http://uwaterloo.ca/academicintegrity/Students/index.html>

Students are also expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for their actions. Students who are unsure whether an action constitutes an offense, or who need help in learning how to avoid offenses (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. Students may also complete the following tutorial:

<https://uwaterloo.ca/library/get-assignment-and-research-help/academic-integrity/academic-integrity-tutorial>

When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses

and types of penalties, students should refer to Policy 71 - Student Discipline: <https://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-71>. Students who believe that they have been wrongfully or unjustly penalized have the right to grieve; refer to Policy #70, Student Grievance: <https://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-70>

◆ Note for students with disabilities: AccessAbility Services, located in Needles Hall, Room 1401, 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 Access Ability Services at the beginning of each academic term.

◆ Mental Health: The University of Waterloo, the Faculty of Environment and our Departments/Schools consider students' well-being to be extremely important. We recognize that throughout the term students may 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 <http://www.uwaterloo.ca/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, stress management, depression, grief, substance use, sexuality, relationship issues, and much more.

◆ Religious Observances: Students need to inform the instructor at the beginning of term if special accommodation needs to be made for religious observances that are not otherwise accounted for in the scheduling of classes and assignments.

◆ Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. See Policy 70 - Student Petitions and Grievances, Section 4, www.adm.uwaterloo.ca/infosec/Policies/policy70.htm. When in doubt please contact your Undergraduate Advisor for details.

◆ Appeals: A decision made or penalty imposed under Policy 70 - Student Petitions and Grievances (other than a petition) or Policy 71 – (Student Discipline) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72 (Student Appeals) www.adm.uwaterloo.ca/infosec/Policies/policy72.htm

◆ Unclaimed assignments:
Unclaimed assignments will be retained for ... [period of time*; or: “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](#).

◆ Communications with Instructor and Teaching Assistants:
All communication with students must be through either the student’s University of Waterloo email account or via Learn. If a student emails the instructor or TA from a

personal account they will be requested to resend the email using their personal University of Waterloo email account.

◆Recording lectures:

- Use of recording devices during lectures is only allowed with explicit permission of the instructor of the course.
- If allowed, video recordings may only include images of the instructor and not fellow classmates.
- Posting of videos or links to the video to any website, including but not limited to social media sites such as: facebook, twitter, etc., is strictly prohibited.

◆Co-op interviews and class attendance: Co-op students are encouraged to try and choose interview time slots that result in the least amount of disruption to class schedules. When this is challenging, or not possible, a student may miss a portion of a class meeting for an interview. Instructors are asked for leniency in these situations; but, a co-op interview does not relieve the student of any requirements associated with that class meeting.

When a co-op interview conflicts with an in-class evaluation mechanism (e.g., test, quiz, presentation, critique), class attendance takes precedence and the onus is on the student to reschedule the interview. CECA provides an interview conflict procedure to manage these situations.

Students will be required to provide copies of their interview schedules (they may be printed from WaterlooWorks) should there be a need to verify class absence due to co-op interviews.