

University of Waterloo  
Department of Geography and Environmental Management

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

Winter 2020  
T Th: 10:00 - 11:20  
Lecture Room: EV3 room 1408

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Office Hours: TBA

Course TA: Office Hours TBA

Course Description - Undergraduate Calendar 2019-2020

GEOG 309 Physical Climatology

Principles of physical climatology with emphasis on regional and global change and variability. Topics include radiation and energy balances, general circulation patterns, synoptic development and micro-climatology.

*COURSE OBJECTIVES:*

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

- 1/ Fundamentals of regional and global climate change and variability, natural and human dimensions
- 2/ Physical basis of different scale atmospheric processes
- 3/ The concepts of feedbacks
- 4/ How do the fundamental processes explain my daily experience of weather and climate?
- 5/ Current climate topics such as global warming, El Niño, La Niña, and their effect on the Canadian.
- 6/ How can I explain my understanding of the issues of climate change and variability ideas to others with confidence and persuasion?

*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.

Paperback or Loose leaf are available at UW bookstore

(Paperback 9780321984432 \$177.15, Loose leaf 9780321994554 \$90.00)

<http://catalogue.pearsoned.ca/>

eText 9780133943641 \$45.9

Note that there will be interactive tests 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	I-Clicker tests	25
		Participation Marks	5
		Two Mid-terms	30
Assess public debate on Climate Change and Variability	Newsfeeds	Group discussion on Learn	15
Assess role of weather on personal daily activity	“GEO-WIKI”	Photography app completion	15
Analysis of Weather events during the course	Analysis of Sequence of Weather Maps in Class	Weather Map Group Assignment. Working as groups of 6 and explain the sequence and processes of weather in Southern Ontario	10

## PLEASE NOTE:

**Missing I-clicker Test or Exam:** If you miss midterm exam or I-clicker test 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!

The note does NOT guarantee an alternative arrangement! The arrangement may only be provided based upon my judgment of the situation.

*Typically*, a missed exam 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.

**Also note, only ONE missed exam**, 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.

**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 tests:

**Note that there will be interactive tests (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 5 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 notes for the lectures in advance. I reserve the right to change the notes during the topic. 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	Reading 5 <sup>th</sup> Edition pages	Reading 7 <sup>th</sup> Edition pages	Weather Assignment Due	GeoWiki Assignment Due	Blog Assignment Due	IClicker Test
1	Jan 7	Introduction: (Course Introduction)						
	Jan 9	Climate Change and Variability, Human Dimensions)	519-527	497-512 Ch. 16				
2	Jan 14	Radiant Energy Flow (Part 1)	32-44 59-69 72-75	32-42 54-71				Unmarked Test 1
	Jan 16	Video: Thin Ice: The Inside Story of Climate Science		Ch. 2,3				
3	Jan 21	Radiant Energy Flow (Part 2)				GeoWiki 1 midnight January 24	Blog 1 midnight January 22	Marked Test 2
	Jan 23							
4	Jan 28	Other types of Energy Flow (Part 3)	35-36 69-72 77-97	35-36 64-67 71-89				Marked Test 3
	Jan 30			Ch. 2.3				
5	Feb 4	In Class Mid Term TEST 1	101-129	90-119 216-245 Ch. 4,8			Blog 2 midnight February 7	Unmarked Test 4
	Feb 6	Circulation Processes (Part 1)						
6	Feb 11	Video: "Arctic Circle: On Thin Ice"						
	Feb 13							
Reading Week								

7	Feb 25  Feb 27	Circulation Processes (Part 2)				GeoWiki 2 midnight February 26	Blog 3 midnight February 29	Marked Test 5
8	Mar 3  Mar 5	Circulation Processes (Part 3)						Unmarked Test 6
9	Mar 10  Mar 12	Weather Systems and Synoptic Development (Part 1)	273-295 299-325	262-285 287-313  Ch.9			Blog 4 midnight March 13	Marked Test 7
10	Mar 17  Mar 19	Weather Systems and Synoptic Development (Part 2)						Unmarked Test 8
11	Mar 24  Mar 26	Video: "The Great warming..."  In Class Mid Term TEST 1						
12	Mar 31  Apr 2	Ocean Circulations  Climate Models and Issues of Climate Change	497-533	474-513  Ch.16	Weather Assignment midnight April 3	GeoWiki 3 midnight April 1	Blog 5 midnight April 3	Marked Test 9

## 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](http://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](http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm)
  
- ◆ 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](#).



◆ **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.