

Weather and Water, GEOG2013-A

Carleton University
Department of Geography & Environmental Studies
Fall 2021

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Virtual Office Hours: Thursday (4:00pm-5:00pm) or by appointment
Virtual Office Hours Zoom Link: <https://carleton-ca.zoom.us/j/99445939783>

INTRODUCTION

This course introduces you to the study of climate, weather and the hydrological cycle. Physical properties of the atmosphere, radiation and energy balances, global circulation, atmospheric moisture and precipitation, weather systems and forecasting, mechanisms of climate change. The topics in this course are important to students interested in the atmospheric sciences and to students who wish to acquire more knowledge about the atmosphere and the environment.

COURSE EDUCATIONAL GOALS

The main goal of this course is to introduce you to major concepts and terminology necessary to observe, interpret, and understand the atmosphere around you and to situate these ideas in the context of real-world issues, including climate change and violent weather. By the end of this course you will be able to: (1) apply radiation, energy and water balance concepts and evaluate mass budgets for these using observed measurement data; (2) describe the relationship and characteristic differences between surface and upper tropospheric winds; (3) to be able to understand and perhaps even make your own weather forecasts; (4) demonstrate an understanding of the meteorologic nature and climatologic significance of severe storms; and (5) discuss the nature, significance and effects of both deliberate and inadvertent climatic modification and change.

COURSE FORMAT AND TECHNOLOGICAL REQUIREMENTS

Blended delivery with a mixture of synchronous online meetings and asynchronous activities. There are **three synchronous class lecture meetings via zoom**. Students are also expected to take **Fixed Duration** midterm and the final exams. The schedule of the synchronous class activities is provided in “GEOG2013 Synchronous Online schedule” table on this page. The rest of the lectures will be delivered asynchronously. Students will complete all their lab requirements through asynchronous activities.

GEOG2013 Synchronous Online Schedule

Date and Time	Lecture Topic/Activity	Zoom Link
Monday September 13 2021 2:35pm-4:25pm ET	Class Orientation and Introduction to GEOG2013	https://carleton-ca.zoom.us/j/91457250013
Monday October 11 2021 2:35pm- 4:25pm ET	Precipitation	https://carleton-ca.zoom.us/j/91457250013
Monday October 18 2021 2:35pm- 4:25pm ET	Midterm Exam	
Monday December 6 2021 2:35pm-4:25pm ET	Cyclogenesis	https://carleton-ca.zoom.us/j/91457250013
December (exact date and time to be announced)	Final Exam	

All course content (lectures, labs, quizzes, midterm exam, and final exam) is presented online via the course Brightspace site [Homepage - GEOG2013A Weather and Water \(LEC\) Fall 2021 \(carleton.ca\)](#). You will be able to access Brightspace course site and to download files on the first week of classes. If you are not able to login, please contact the course instructor.

Regarding the asynchronous activities of the class, students are expected to spend at least 5 to 6 hours per week watching the recorded lectures and completing the lab assignments.

For best online learning experience, Carleton's ITS recommends the following minimum technical requirements: Windows 10 or macOS 10.15 operating system; Google Chrome, Firefox, and/or Edge web browser; Intel Core i5 based model processor; 4GB Ram/Memory; minimum 5 GB available storage; 1-24x768 screens resolution; WiFi or Ethernet; available USB port(s) to accommodate recommended accessories; antivirus; high speed internet; and speakers, microphone or headphones, Video Camera, Keyboard.

COURSE TEACHING ASSISTANTS

Check Brightspace for TA contact information and office hours.

RECOMMENDED TEXTBOOK

Ross, Sheila Loudon. (2017) *Weather & Climate: an introduction*, 2nd Edition, Oxford University Press, Don Mills, Ont. Will be available from Carleton University Bookstore.

SCHEDULE

GEOG2013 starts on Monday September 13 2021 and ends on Wednesday December 8 2021. The weekly work completed in this class is equivalent to one 2hr lecture and one 3hr lab session.

Lectures: The content of this course is spread over 14 Weeks (Week 1 until Week 14). Each week will present up to two related topics. Each of Week 2-Week 13 contains a series of 3-6 recorded mini lectures (20-30min each). These lectures were recorded during the Winter 2020 GEOG2013 live streaming. These lecture videos will include one or more interactive questions. At the end of each video, you must go to the 'Submit Screen' (star button at end of video timeline) and press the 'Submit Answers' button for your answers to be submitted to the gradebook. An example of an interactive video can be found here: <https://h5p.org/interactive-video>.

At the end of each week, you will take a quiz (named Week 2 Quiz, Week 3 Quiz, etc.) that allows you to test your acquired knowledge from watching the recorded lectures. Students are expected to complete the recorded lectures on their own but it's highly recommended to follow the proposed completion dates. The teaching team will assess your progress through the weekly quizzes, the midterm exam, and the final exam. Deadlines for weekly quizzes in this course occur each Sunday night of the semester.

Lab sessions: You will be assigned five lab assignments in the term and a bonus lab (Lab 0, 1%). These lab assignments require you to apply the principles you have learned from lectures. Each lab assignment will have a recorded introduction to introduce the concepts used in the lab and provide some hints for answering the questions in the lab. Students are expected to watch the recorded lab introduction before attempting the lab assignments.

Lab 1, Lab 2, and Lab 4 are formatted as quizzes and integrated to Brightspace. Lab 3 and Lab 5 are available as pdf handouts and students are expected to type up reports and upload them on their corresponding assignment dropboxes on Brightspace.

Most deadlines of lab exercises in this course occur every week on Wednesday night.

HOW TO GET HELP IN THIS COURSE

For lectures, we are using Lecture Forum on Brightspace answer questions related to lectures. You are welcome to join the instructor zoom office hour to discuss your questions.

For labs, we are using Lab Forum on Brightspace to answer questions related to lab assignments. You are welcome to join the TA zoom office hour to discuss your lab questions.

For general questions related to course organization and/or missed assignments, email the questions to the instructor or the TA.

EVALUATION

Final marks in the course are based on your performance in five categories as follows:

Lecture Interactive Questions	10%
Weekly Quizzes (10 quizzes, 2%each)	20%
Midterm Exam	15%
Lab Assignments/Exercises	35%
Final Exam	20%

Standing in a course is determined by the course instructor subject to the approval of the Faculty Dean. This means that grades submitted by the instructor may be subject to revision. No grades are final until they have been approved by the Dean.

Lecture Interactive Questions

To encourage and enable active student engagement in lectures, this course uses zoom polling during the live synchronous lectures and H5P interactive questions as part of the recorded short lectures. Most of the short lectures will prompt students to answer 2-3 questions. To receive the full 10% marks from the interactive questions, all zoom polling and H5P interactive questions in all videos must be answered.

Weekly Quizzes

There will be ten weekly quizzes (2% each) and a bonus orientation quiz (1%). Each weekly quiz will cover the lecture content covered in a specific week. For instance, Week 2 Quiz covers the topics covered in Week 2. Each weekly quiz will consist of 5 multiple choice questions with only one right answer to each question. Once you start the quiz, you have 10 minutes to complete and submit your answers. You have one attempt for each weekly quiz. Students who fail to submit a quiz will receive an automatic grade of zero. The only exceptions will be for instances of significant illness or a family emergency.

Lab Assignments/Exercises

There will be five lab assignments (35% of the total course grade) and an orientation lab (bonus 1%). The lab exercises are meant to complement the course material and to facilitate application and integration of knowledge gained from lectures and readings. Check the course schedule below for due dates for each lab. Late assignments will be penalized by subtracting 10% per day of the total value of the assignment.

Students whose assignments are late because of a valid medical reason or family emergency will not be penalized.

Exams

Exams will be conducted online in the format of a quiz available on course Brightspace site. Exams will cover lecture materials. Only students who have made prior arrangements with the instructor, or students who have contacted the instructor within 5 days of the missed midterm exam will be permitted to write the make-up exam.

COURSE POLICIES

Missed Final Exam

Students who are not able to write the final exam during the exam period must consult with *Exam Services* as soon as they are aware that they will miss the test.

Late Assignments

Late assignments will be penalized by subtracting 10% per day of the total value of the assignment. Students are also encouraged to directly connect with the course instructor to discuss required accommodations arising from the COVID-19 situation.

Missed Assignments or Quizzes

students are advised to complete the [self-declaration form](#) available on the Registrar's Office website to request academic accommodation for missed course work including exams and assignments. Students are also encouraged to directly connect with the course instructor to discuss required accommodations arising from the COVID-19 situation. Students who are not able to write the final exam during the exam period must consult with *Exam Services* as soon as they are aware that they will miss the test.

Standards of Written Work

Lab3 and Lab 5 assignments should be written using *word processing software* and checked for spelling and grammar. The overall presentation quality of the assignments will be reflected in your grade.

ACADEMIC INTEGRITY

Academic integrity is a necessary foundation for all meaningful scholarly activity and verified instances of intellectual dishonesty will be dealt with in full accordance with the procedures laid out in Academic Integrity Policy. Additional information regarding what constitutes plagiarism may be found on Carleton University web site: <https://carleton.ca/secretariat/wp-content/uploads/Academic-Integrity-Policy-2021.pdf> The University Senate defines plagiarism as “presenting, whether intentionally or not, the ideas, expression of ideas or work of others as one’s own.” This can include:

- reproducing or paraphrasing portions of someone else’s published or unpublished material, regardless of the source, and presenting these as one’s own without proper citation or reference to the original source;
- submitting a take-home examination, essay, laboratory report or other assignment written, in whole or in part, by someone else;
- using ideas or direct, verbatim quotations, or paraphrased material, concepts, or ideas without appropriate acknowledgment in any academic assignment;
- using another’s data or research findings;
- failing to acknowledge sources through the use of proper citations when using another’s works and/or failing to use quotation marks;

Plagiarism is a serious offence which cannot be resolved directly with the course's instructor. The Associate Dean of the Faculty conducts a rigorous investigation, including an interview with the student, when an instructor suspects a piece of work has been plagiarized. Penalties are not trivial. They can include a final grade of "F" for the course.

ACADEMIC ACCOMMODATION

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

Pregnancy obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: <http://www.carleton.ca/equity/>

Religious obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: <http://www.carleton.ca/equity/>

Academic Accommodations for Students with Disabilities: The **Paul Menton Centre** for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your **Letter of Accommodation** at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (*if applicable*). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (*if applicable*) at <http://www.carleton.ca/pmc/new-and-current-students/dates-and-deadlines/>. You can visit the Equity Services website to view the policies and to obtain more detailed information on academic accommodation at <http://www.carleton.ca/equity/>

Survivors of Sexual Violence: As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: <https://carleton.ca/equity/sexual-assault-support-services>

Students representing Carleton University, Ontario or Canada (at academic or sports events): I fully support students involved with organizations and teams that travel during the semester; however, with this privilege comes additional responsibility. You are responsible for providing formal documentation identifying the organization you represent and potential schedule conflicts with this course. In the event that you are travelling and unable to attend an exam, you must schedule a secondary exam before you depart. Without proper documentation, a missed exam will earn zero points.

Weather and Water (GEOG2013)-A
Fall term 2021 Course Outline

Week	Lecture	Lab	Readings
Sept. 08-10		Lab exercise 0: Bonus Lab (1%)	Course Outline
Sept. 13-17	<i>Synchronous class lecture on Mon. Sept. 13 2:35pm-4:25pm ET</i> Introduction to the course Atmospheric Pressure and Composition <i>Complete Week 2 Quiz by Sept. 19 11:59pm</i>	Lab exercise 1: Atmospheric Pressure and Radiation Laws (5%) <i>Lab exercise 0 is due on Wed. Sept. 15 11:59pm</i>	Ch. 1 (13-16) Ch. 2 (20-39) Ch. 3 (53-56)
Sept. 20-24	Energy and Radiation laws Shortwave radiation <i>Complete Week 3 Quiz by Sept. 26 11:59pm</i>	Lab exercise 1: Atmospheric Pressure and Radiation Laws	Ch. 4 Ch. 5 (88-117)
Sept. 27- Oct. 1	Longwave radiation Net radiation and Heat balance <i>Complete Week 4 Quiz by Oct. 3 11:59pm</i>	Lab exercise 2: Longwave (IR) and Net Radiation (7%) <i>Lab exercise 1 is due on Wed. Sept. 29 11:59pm</i>	Ch. 6 (139-145)
Oct. 4-8	Humidity and Condensation <i>Complete Week 5 Quiz by Oct. 10 11:59pm</i>	Lab exercise 2: Longwave (IR) and Net Radiation	Ch. 7 Ch. 9 (216-236) Ch. 10 (242-247)
Oct. 11-15	<i>Synchronous class lecture on Mon. Oct. 11 2:35pm-4:25pm ET</i> Clouds and precipitation <i>Complete Week 6 Quiz by Oct. 17 11:59pm</i>	Lab exercise 3: Atmospheric Humidity, Energy and Water Budgets (8%) <i>Lab exercise 2 is due on Wed. Oct.13 11:59pm</i>	
Oct. 18-22	Oct. 18: MIDTERM EXAM	Lab exercise 3: Atmospheric Humidity, Energy and Water Budgets	
Oct. 25-29	NO CLASSES-TERM BREAK	NO CLASSES-TERM BREAK	
Nov. 1-5	Buoyancy and stability Thermodynamic diagrams: tephigram <i>Complete Week 9 Quiz by Nov. 7 11:59pm</i>	Lab exercise 4: Atmospheric Stability and the Thermodynamic Diagram (8%) <i>Lab exercise 3 is due on Wed. Nov. 3 11:59pm</i>	Ch. 8 (185-209)
Nov.8-12	Thermodynamic diagrams: tephigram (cont'd) <i>Complete Week 10 Quiz by Nov. 14 11:59pm</i>	Lab exercise 4: Atmospheric Stability and the Thermodynamic Diagram	Ch. 11
Nov.15-19	Atmospheric motion <i>Complete Week 11 Quiz by Nov. 21 11:59pm</i>	Lab exercise 5: Geostrophic Wind (7%) <i>Lab exercise 4 is due on Wed. Nov. 17 11:59pm</i>	Ch. 12 (294-302)
Nov.22-26	Atmospheric motion (cont'd) Wind systems <i>Complete Week 12 Quiz by Nov. 28 11:59pm</i>	Lab exercise 5: Geostrophic Wind	Ch. 12 (310-314)
Nov. 29 Dec. 03	Air Masses Cyclogenesis <i>Complete Week 13 Quiz by Dec. 5 11:59pm</i>	Lab exercise 5 is due on Wed. Dec. 1 11:59pm	Ch. 13 Ch. 14: (341-357)
Dec. 06-10	<i>Synchronous class lecture on Mon. Dec. 11 2:35pm-4:25pm ET</i> Cyclogenesis (Cont'd)		
Dec.	FINAL EXAM (20%)		