Weather and Water, GEOG2013-A

Carleton University
Department of Geography & Environmental Studies
Winter 2020

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Office Hours: Monday (12:30pm-1:30pm) or by appointment

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

Lectures will follow the attached course outline. The schedule may require minor revisions to accommodate unexpected scheduling issues. The lectures will introduce and illustrate the major concepts in global environmental systems. Support material will be available on the cuLearn course site.

SCHEDULE

Lectures: Monday 9:35am- 11:25am in Mackenzie Building 3380

Lab sessions:
- section A01: Monday 2:35pm-5:25pm in Loeb Building A120
- section A02: Thursday 2:35pm-5:25pm in Loeb Building A120
- section A03: Wednesday 2:35pm-5:25pm in Loeb Building A120
- section A04: Friday 8:35am-11:25am in Loeb Building A120
- section A05: Tuesday 2:35pm-5:25pm in Loeb Building A120

Note the labs will run in the following order: A01→A05→ A03→A02→ A04

COURSE TEACHING ASSISTANTS

Check cuLearn 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.

STUDENT RESOURCES AND COMMUNICATION

Office Hours, Email and Appointments

If you have questions pertaining to lecture materials, I encourage you to come to my office hours or to meet me at the end of class to make an appointment.

All questions about missed assignments, missed exams, and other practical concerns about the course should be directed to me by email. Emails will be responded to during business hours only. Please place the course number GEOG 1010 in the subject line. Private correspondence with the Instructor and Teaching Assistants should be through a Carleton email account (this is accessible in cuLearn).

cuLearn Course Site

The cuLearn course site of GEOG 2013 contains information on all aspects of the course. It includes partial outlines of lectures (not complete notes) and graphs or diagrams presented in class. You need to supplement these notes by attending the class lectures or by referring to the textbook. You will be able to access cuLearn course site and to download files on the first week of classes. If you are not able to login, please contact the course instructor.

EVALUATION

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

Participation (Reef Polling/iClickers and in class activities)	10%
Lab Exercises	35%
Midterm Lecture Exam	25%
Final Lecture Exam	30%

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.

Participation

To encourage and enable active student participation in lectures, this course requires the use of iClicker Reef (also know as REEF Polling, a mobile friendly version of iclickers).

Setting up iClicker Reef Account**:**

1-Create your iClicker Reef account: Go to https://app.reef-education.com/#/account/create or download the iClicker Reef free application on your smart device then select sign up option.

2- Sign up for a 14-day iClicker Reef free account. You should use your university email address and your Carleton University ID in the Student ID field. After the 14-day trial period, you have to pay for subscription ($19.50 for a six-month subscription).

3- Search with the following information to find this course and **add** it to your iClicker Reef account:
Institution: Carleton University
Course: GEOG2013: Weather and Climate

Lab exercises

There will be seven lab assignments (5% each of the total course grade). The lab exercises are meant to complement the course material and to facilitate application and integration of knowledge gained from lectures and readings. The lab exercises will be posted on cuLearn at least one day ahead of their corresponding lab session. Please feel free to collaborate with others during the lab sessions to obtain common data, but please submit your own individually-written lab reports that contain your own analyses and answers to questions.

Exams
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 exam with a valid doctor's note explaining why they missed the exam will be permitted to write the makeup exam. There will be no makeup final 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.

Standards of Written Work
Any assignment submitted should be printed 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.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;
•handing in "substantially the same piece of work for academic credit more than once without prior written permission of the course instructor in which the submission occurs."
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 Department of Equity and Inclusive Communities 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 Department of Equity and Inclusive Communities 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 https://carleton.ca/pmc/students-registered-with-pmc/important-dates-and-deadlines/

You can visit the Department of Equity and Inclusive Communities website to view the policies and to obtain more detailed information on academic accommodation at http://www.carleton.ca/equity/

HINTS FOR SUCCESS

It is in your best interest to attend class regularly and to participate in class. Try to keep up with your readings and address questions you have on the subject matter at the appropriate time rather than waiting until just before the midterm and final for clarification.

Weather and Water (GEOG2013)-A
Winter term 2020 Course Outline

Week	Lecture	Lab	Readings
Jan 6-10	Introduction to Course Atmospheric Composition and Structure & Air Pressure	***NO LAB***	Ch. 1 (13-16) Ch. 2 (20-39) Ch. 3 (53-56)
Jan 13-17	Energy and Radiation laws Shortwave radiation	Introduction to lab Lab exercise 1: Air Pressure	Ch. 4 Ch. 5 (88-96) Ch. 5 (105-117)
Jan 20-24	Shortwave radiation and Longwave radiation	Lab exercise 2: Air Temperature ***Lab 1 is due at the beginning of the lab period***	Ch. 5 (96-105) Ch. 6 (124-137)
Jan 27-31	Net radiation and Heat balance	Lab exercise 3: Longwave (IR) and Net Radiation ***Lab 2 is due at the beginning of the lab period***	Ch. 6 (139-145)
Feb 3-7	Humidity and condensation	Lab exercise 4: Atmospheric Humidity, Energy and Water Budgets ***Lab 1 is due at the beginning of the lab period***	Ch. 7 Ch. 9 (216-236) Ch. 10 (242-247)
Feb 10-14	Clouds and precipitation	Lab exercise 4: Atmospheric Humidity, Energy and Water Budgets (Cont'd). ***Lab 4 is due at the end of the lab period***	
Feb 17-21	*NO CLASSES-READING BREAK*	*NO CLASSES-READING BREAK*	
Feb 24-28	***Feb 24: MIDTERM EXAM***	***NO LAB***	
March 2-6	Buoyancy and stability Thermodynamic diagrams: tephigram	Lab exercise 5: Atmospheric Stability and the Thermodynamic Diagram	Ch. 8 (185-209)
March 9-13	Thermodynamic diagrams: tephigram (cont'd)	Lab exercise 5: Atmospheric Stability and the Thermodynamic Diagram (Cont'd) ***Lab 5 is due at the end of the lab period***	Ch. 11
March 16-20	Atmospheric motion Wind systems: Global wind systems	Lab exercise 6: Geostrophic Wind	Ch. 12 (294-302)
March 23-27	Vorticity and Rossby Wave Air masses and fronts	Lab exercise 7: Synoptic systems ***Lab 6 is due at the end of the lab period***	Ch. 12 (310-314) Ch. 13
March 30 April 3	Cyclogenesis	Lab exercise 7: Synoptic systems (Cont'd) ***Lab 7 is due at the end of the lab period***	Ch. 14: (341-357)
April 6	Cyclogenesis (Cont'd)		
April	***FINAL EXAM (25%).***		