

Weather and Water GEOG 2013

[0.5 credit]

Winter 2017

Lecture: Tues and Thursday, 11:35-12:55

Labs: 3 h/session, 8 sessions through the term

Instructor: Elyn Humphreys, B359 Loeb, <elyn.humphreys@carleton.ca>

Office hours: Tues 1–2 pm or by appointment

1. Calendar Description: Introduction to 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.

Course Objectives: The objective of the course is to provide fundamental understanding of the processes operating in the atmosphere and the hydrosphere. Topics will include (yet are not restricted to) the physical properties of the atmosphere, radiation laws, radiation and energy balances, global circulation, atmospheric moisture and precipitation, stability and adiabatic processes, weather systems, weather forecasting, mechanisms of climate change, the hydrological cycle, surface water, evaporation and groundwater.

2. Prerequisites: None

3. Textbook, lecture notes, and laboratory manual:

1) Ross, Sheila Loudon. (2013) *Weather & Climate: an introduction*, Oxford University Press, Don Mills, Ont. 510 pp. Will be available from Carleton University Bookstore.

2) Lecture notes will be made available on CULearn.

3) Laboratory assignments will be available on CULearn.

4. Lecture and Lab schedule:

Tentative schedule:

Jan 5: Lecture 1. Introduction – Ch 1
No labs this week

Jan 10-12: Lecture 2. Structure & behaviour of the atmosphere – Ch 2
Lecture 3. Forecasting the weather – Ch 15
No labs this week

Jan 17-19: Lecture 4. Thermodynamics in Meteorology /Discussion with weather maps & terminology, time zones and UTC – Ch 3
Lecture 5. Energy & atmospheric stability Ch 4 & 8
Lab 1 – Pressure and the atmosphere

Jan 24-27: Lecture 6. Energy & atmospheric stability (continued) Ch 4 & 8
Lecture 7. Energy fluxes and energy budgets – Ch 5& 6
Lab 2 – Measures of atmospheric temperature

Jan 31, Feb 2: Lecture 8. Energy fluxes and energy budgets (continued) – Ch 5& 6
Lecture 9. Clouds and precipitation – Ch 9 & 10
Lab 3 – Measures of energy fluxes

Feb 7-9: Lecture 10. Clouds and precipitation (continued) – Ch 9 & 10
Lecture 11. Dynamics – Ch 11
Lab 4 – Clouds & humidity – Ch 7

Feb 14-16: Lecture 12. Midterm review (Lectures 1-10)
Midterm in class (Feb 16)
No labs this week

Reading week

Feb 28, Mar 2: Lecture 13. Dynamics (continued) – Ch 11
Lecture 14. Global circulation & teleconnections – Ch 12
Lab 5 – Precipitation measurements

Mar 7-9: Lecture 15. Global circulation & teleconnections (continued) – Ch 12
Lecture 16. Air masses– Ch 13
Lab 6 – Wind

Mar 14-16: Lecture 17. Fronts – Ch 13
Lecture 18. Mid-latitude cyclones – Ch 14
Lab 7 – Weather maps – part 1

Mar 21-23: Lecture 19. Mid-latitude cyclones (continued) – Ch 14
Lecture 20. Hurricanes – Ch 14
Lab 8 – Weather maps – part 2

Mar 28-30: Lecture 21. Thunderstorms – Ch 14
Lecture 22. Tornadoes – Ch 14
No labs this week.

April 4-6: Lecture 23. Hydrology topic
Lecture 24. Final exam review (Lectures 11, 12 – 23)
No labs this week.

5. Evaluation:

In-class activities & quizzes	5%	
Laboratory assignments	40%	(8 x 5%)
Midterm test	25%	(held in class, Feb 16)
Final exam	30%	(held during the exam period)

In-class activities & quizzes: Up to 5% of the final grade will be available through participation during in-class activities & quizzes (worth 0.4% per lecture). There will be ~ 16 lectures with opportunities to receive these marks. No marks will be given if absent, no exceptions.

Laboratory assignments:

Eight mandatory laboratory sessions will be held during which you will explore instrumentation used to study weather and water and further develop the concepts introduced during the lectures through hands-on activities and problem sets. Each lab assignment will be given equal weight towards the lab grade.

Collaborative effort in working out assignments is encouraged, and often required, although individual reports must be submitted. This means that you may submit the same group-derived tables or data sheets (these will be identified by your teaching assistants in the labs), but all answers to questions, analyses and discussion points must be your own work (see note about Plagiarism below).

Except under special circumstances, you must pass the lab section in order to pass the course.

Policy on lateness:

Assignments generally are due at the beginning of your lab one week after distribution, unless otherwise indicated. Late assignments will be penalized unless accompanied by appropriate documentation. If handed in any time after the beginning of your lab period, your assignment will be penalized by 5% and then 5% for every additional day (5% per weekend) and will not be accepted after assignments have been returned to the first lab section of the week. If you are having difficulty meeting the deadlines, contact Elyn Humphreys **in advance** of the due date.

Examinations:

There will be a midterm test given during the lecture period and a final exam held during the scheduled exam period at the end of term. The exact content of the tests will be discussed in class prior to their respective dates.

6. Statement on Plagiarism:

Plagiarism will not be tolerated. Students should consult the *Academic Integrity Policy* at <http://www.carleton.ca/studentaffairs/academic-integrity/>.

Plagiarism: 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 Deans of the Faculty conduct 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.

7. Requests for Academic Accommodations:

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 see the Student Guide.

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 see the Student Guide.

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).

You can visit the Equity Services website to view the policies and to obtain more detailed information on academic accommodation at <http://carleton.ca/equity/accommodation>.