

**DEPARTMENT OF GEOGRAPHY
- COURSE OUTLINE -**

**GEOG 305
Weather and Climate
Fall 2017**

Section	Days	Times	Location
LEC01	TuTh	14:00-15:15	ES443
LAB01	Tu	08:00-09:50	SS018
LAB02	We	11:00-12:50	SS018

Instructor: Brent Else	Office: ES340
Telephone: 403-220-2484	Email: belse@ucalgary.ca
Office Hours: by appointment	

Teaching Assistant: Kristina Miller	Office: TBA
Email: kristina.miller1@ucalgary.ca	Office Hours: TBA

Please note: The appropriate emergency evacuation assembly point for all classes taught in Earth Sciences is ICT Food Court, and Social Sciences is the Professional Faculties Food Court.

Official Course Description:

Physical principles of meteorology and climatology. Weather development in relation to different scales of atmospheric circulation. Elements of synoptic and dynamic climatology as determinants of characteristics and the distribution of climates. Laboratory work emphasizes North American examples.

Course Objectives:

This course studies the Earth's atmosphere; how it heats and cools, how it moves, and how it transports water. Combined, those things make up what we usually think of as weather. By the end of this course you should have a good understanding of how weather happens, and why it varies from place to place and year to year. This last point (how weather varies in space and time) is climate; by the end of this course you should have a good grasp on climate, and how it is presently changing due to human activities.

Course Learning Outcomes:

The Department of Geography is committed to student knowledge and skill development. The table below lists the key learning outcomes for this course, the program-level learning outcomes (PLO) they facilitate, and the expected level of achievement.

Course Learning Outcomes	PLO(s)	Level(s)
Understand the climate system	2	3
Explain how key climate parameters give rise to global, regional, and local patterns	2	2
A first-order understanding of climate change	2	1
A quantitative understanding of weather processes	3	2

Students should be able to explain global weather patterns	2	3
Students will be expected to integrate basic principles of conservation of energy, mass and momentum to explain atmospheric phenomena	2	2
Students will be expected to solve quantitative problems through selection and manipulation of the relevant equations and basic spreadsheet skills	4,7	2
Students should be able to apply knowledge about atmospheric science into other undergraduate courses and workplace responsibilities	2,5	2
Students should be able to explain the weather conditions they are currently experiencing, wherever in the world they find themselves	5	1
Distinguish between weather and climate through understanding of spatio-temporal process, laws, and theories and models as a function of spatial scale	2	1
List sources and sinks for the most common atmospheric gases and aerosols and appreciate the important roles of carbon dioxide, water vapour, and ozone	5	2
Distinguish between sensible and latent heat, temperature, energy and work; explain how energy is transferred as heat; first law of thermodynamics	2	2
Describe EMR and distinguish between radiation emitted by sun and earth; describe albedo and the role in climate; explain greenhouse gas effects	7	2
Describe and account for flows of energy that make up planetary energy balance, describe and account for radiative (and non) heat flows at surface	2	2
Distinguish between types of water vapour; adiabatic process; atmospheric stability; cloud/precipitation formation mechanisms, and clouds	2	2
Describe the forces that act on air to create local to global wind at the surface and aloft; horizontal and vertical motions of pressure systems	7	2
Describe general circulation of atmosphere, global heat/energy transfer; jet streams; air masses; storms; climate change	7	2

Required Texts:

Meteorology Today: An Introduction to Weather, Climate, and the Environment, 2nd Canadian Edition (2016). Ahrens, Jackson, & Jackson. Nelson Education. ISBN-13: 978-0-17-653079-2. On order at the bookstore.

Grading (Weighting):

There is a final examination, to be scheduled by the Registrar's Office. It is not essential to pass all elements/components to pass the course as a whole.

- Lab Assignments: 30% (5 assignments @ 6% each)
- Quizzes: 20% (4 quizzes @ 5% each)
- Midterm Exam: 20%
- Final Exam: 30% (Scheduled by registrar)

Quizzes: There will be four 20 minute in-class quizzes, based on lecture material and reading assignments. These quizzes will be at the start of the class. If you keep up with your weekly reading these will be straightforward. Quizzes are worth 5% each. All quizzes are closed book.

Labs: There will be a series of six labs, each worth 5% of your final mark. You have 1-2 weeks to complete each lab exercise. The lab TA will be available during the lab periods. Lab exercises are a blend of computer-based data analysis and desktop analysis of weather charts. While many of the exercises can be completed at home, you are encouraged to come to your lab period for help. Most of the exercises are designed to be completed within the two-hour time period. Individual written assignments are required for each lab. You are welcome to work on the lab assignments together, but your submissions must be your own, and of course, as always, do not plagiarize or it is an automatic 0 for all involved.

Final Exam: Cumulative, Closed book. Two hours. To be scheduled by the registrar.

Late Policy: Assignments submitted after the stated deadline will be penalized with the loss of a grade of 10% for **each day** late (including weekends). Exceptions to this policy must be discussed and confirmed with the lead instructor **in advance of the due date**. If a student fails to complete an assignment or similar set piece of work for legitimate reasons (for example: illness or domestic affliction), an alternative course of action must be discussed with the lead instructor or course assistant in a timely fashion and documentation will be required as per the University Calendar.

Grading System:

94-100	A+	74-78	B	60-63	C-
86-94	A	70-74	B-	55-50	D+
82-86	A-	67-70	C+	50-55	D
78-82	B+	63-67	C	0-50	F

In this course, most assignments will be assessed using a rubric. Rubrics communicate expectations for course work, and provide a framework for assessment. This approach applies to the course as a whole, and students can expect letter grades to reflect the following criteria of achievement:

Grade	Criteria
F	Student cannot display a basic understanding of course materials
D	Student displays only a basic understanding of course materials
C	Student has a modest understanding of course materials, and can apply those understandings in basic problem solving.
B	Student has a good understanding of course materials, and can make connections between various course topics to solve interconnected problems.
A	Student has an excellent understanding of course material, and can solve problems not directly discussed in lectures/readings/assignments.

Human Subjects

Students will NOT participate as subjects or researchers on human subjects.

Writing across the Curriculum

Writing skills are not exclusive to English courses and, in fact, should cross all disciplines. The University supports the belief that throughout their University careers, students should be taught how to write well so that when they graduate their writing abilities will be far above the minimal standards required at entrance. In this course, writing will be graded on assignments and the group project. Specific criteria for assessing writing will be provided for these assignments.

Principles of Conduct

The University of Calgary Calendar includes a statement on the Principles of conduct expected of all members of the University community (including students, faculty, administrators, any category of staff, practicum supervisors and volunteers) whether on or off the University's property. This statement applies in all situations where the members of the University community are acting in their University capacities. All Members of the University Community have a responsibility to familiarize themselves with this statement which is available at:

<http://www.ucalgary.ca/pubs/calendar/current/k.html>

Internet and electronic communication device information:

No restriction on the use of laptops and tablets in class if they are used to take notes or find information relevant to the class, and if there is *no disturbance or distraction of other students or the instructor*. Phones must be turned to silent during class time.

Plagiarism

Academic dishonesty is not an acceptable activity at the University of Calgary and students are **strongly advised** to read the Student Misconduct section in the University Calendar. Quite often, students are unaware of what constitutes academic dishonesty or plagiarism. The most common are 1) presenting another student's work as your own 2) presenting an author's work or ideas as your own without proper referencing and 3) using work completed for another course. This activity will not be tolerated in this course and students conducting themselves in this manner will be dealt with according to the procedures outlined in the calendar.

<http://www.ucalgary.ca/pubs/calendar/current/k-5.html>

Academic Accommodations:

Students needing an accommodation because of a Disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities. The procedure can be found at:

ucalgary.ca/policies/files/policies/student-accommodation-policy

Students needing an accommodation based in relation to their coursework or to fulfil requirements for a graduate degree, on a Protected Ground other than Disability, should communicate this need, preferably in writing to their instructor or the appropriate Associate Dean or Department Head.

ucalgary.ca/policies/files/policies/student-accommodation-policy

Students needing an Accommodation unrelated to their coursework or the requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the Vice-Provost (Student Experience).

Emergency Assembly Points

Assembly Points have been identified across campus. These areas have been selected as they are large enough to hold a significant number of people and will provide an evacuated population access to washroom facilities and protection from the elements. For this course, the following assembly points are relevant:

Building	Primary Assembly Point	Alternate Assembly Point
Math Sciences (Lectures)	Social Science – Food Court	ICT – Food Court
Earth Sciences (Labs)	ICT – Food Court	Social Science – Food Court

Freedom of Information and Protection of Privacy

FOIP: The Freedom of Information and Protection of Privacy (FOIP) legislation disallows the practice of having students retrieve assignments from a public place, e.g., outside instructor's office, the department office, etc. Term assignments will be returned to students individually, during class or during the instructor's office hours; if students are unable to pick up their assignments from the instructor, they provide the instructor with a stamped, self-addressed envelope to be used for the return of the assignment.

Contact Information for Student and Faculty Representation

- SU VP Academic Phone: 220-3911 and e-mail: suvpaca@ucalgary.ca
- SU Faculty Rep. Phone: 220-3913 and e-mail: arts1@ucalgary.ca
- The students ombudsman office information can be found at: <http://www.su.ucalgary.ca/page/affordability-accessibility/su-structure/contact-info>

Re: Posting of Grades and Picking-up of Assignments

- All assignments will be handled through D2L or personally.
- Grades will be available to each student on D2L by password access. Grades will **not** be available at Geography's main office.

Campus Safewalk

Campus Security, in partnership with the Students' Union, provides the Safewalk service, 24 hours a day, to any location on Campus including the LRT, parking lots, bus zones and University residences. Contact Campus Security at 220-5333 or use a help phone, and Safewalkers or a Campus Security officer will accompany you to your Campus destination.

Faculty of Arts Program Advising and Student Information Resources

- Have a question, but not sure where to start? The new Faculty of Arts Program Information Centre (PIC) is your information resource for everything in Arts! Drop in at SS110, call us at 403-220-3580 or email us at artsads@ucalgary.ca. You can also visit the Faculty of Arts website at <http://arts.ucalgary.ca/undergraduate> which has detailed information on common academic concerns.
- For program planning and advice, contact the Student Success Centre (formerly the Undergraduate programs Office) at (403) 220-5881 or visit them in their new space on the 3rd Floor of the Taylor Family Digital Library.

- For registration (add/drop/swap), paying fees and assistance with your Student Centre, contact Enrolment Services at (403) 210-ROCK [7625] or visit them at the MacKimmie Library Block.

Contact for Students Union Representatives for the Faculty of Arts: arts1@su.ucalgary.ca,
arts2@su.ucalgary.ca, arts3@su.ucalgary.ca, arts4@su.ucalgary.ca

◀ August		September 2017					October ▶
Sun	Mon	Tue	Wed	Thu	Fri	Sat	
					1	2	
3	4	5	6	7	8	9	
10	11	12 Lec 1: Intro	13	14 Lec 2: Composition of the Atmosphere	15	16	
17	18	19 Lec 3: Units for Meteorology Lab 1 Intro	20 Lab 1 Intro	21 Lec 4: Structure of the Atmosphere	22	23	
24	25	26 Lec 5: Heat Lab 1 Work	27 Lab 1 Work	28 Lec 6: Radiation (I)	29	30	

September						October 2017	November
Sun	Mon	Tue	Wed	Thu	Fri	Sat	
1	2	3 Lec 7: Radiation (II) Lab 1 Due Lab 2 Intro	4 Lab 1 Due Lab 2 Intro	5 Lec 8: Energy Balance	6	7	
8	9 THANKSGIVING	10 Lec 9: Water Vapour Lab 2 Work	11 Lab 2 Work	12 Lec 10: Condensation	13	14	
15	16	17 Lec 11: Stability Lab 2 Due Lab 3 Intro	18 Lab 2 Due Lab 3 Intro	19 Lec 12: Precipitation	20	21	
22	23	24 Lec 13: Review Lab 3 Work	25 Lab 3 Work	26 MIDTERM	27	28	
29	30	31 Lec 14: Winds (I) Lab 3 Due Lab 4 Intro					

November 2017						December
Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1 Lab 3 Due Lab 4 Intro	2 Lec 15: Winds (II)	3	4
5	6	7 Lec 16: General Circulation Lab 4 Work	8 Lab 4 Work	9 Lec 17: Masses & Fronts	10 READING BREAK	11
12	13 READING BREAK	14 Lec 18: Cyclones Lab 4 Due Lab 5 Intro	15 Lab 4 Due Lab 5 Intro	16 Lec 19: Forecasting	17	18
19	20	21 No Class Lab 5 Work	22 Lab 5 Work	23 Lec 20: Dangerous Weather	24	25
26	27	28 Lec 21: Climate Lab 5 Due	29 Lab 5 Due	30 Lec 22: Climate Change		

◀ November		December 2017					January ▶
Sun	Mon	Tue	Wed	Thu	Fri	Sat	
					1	2	
3	4	5 Lec 23: TBD	6	7 Lec 24: Review	8	9	
10	11	12	13	14	15	16	
17	18	19	20	21	22	23	
24	25	26	27	28	29	30	
31							