

GEOGRAPHY FINAL COURSE OUTLINE: WINTER 2021

GEOGRAPHY 408 GFC HOURS(3-2)

Meteorology & Hydrology

Section	Location	Meeting Time	Meeting Day
LEC 01	Web Based Course	15.30 – 16.45	Tu
LAB 01	Web Based Course	N/A	None – all asynchronous
LAB 02	Web Based Course	N/A	None – all asynchronous
LAB 03	Web Based course	N/A	None – all asynchronous

Instructor: Tricia Stadnyk	Office: ES 458
Email: tricia.stadnyk@ucalgary.ca	

Communication policy All official course communication will be through D2L and ucalgary emails as a means of providing continuity and consistency for students and the instructor(s). For extensions, to report illness, or any other official course matters (e.g., instructor notifying the class of extensions or clarification on deliverables), D2L and ucalgary email addresses only should be used. I endeavor to reply to students within 24 hours. If this does not occur, please resend the email or contact a TA to notify them.

A course SLACK channel will also setup for informal and frequent (i.e., Q&A, discussion, assistance with deliverables) communication between the instructor, TA(s) and students. You will receive an invite by email before the start of term.

Official Course Description

Atmospheric connections with the hydrological cycle, including evapotranspiration, water vapour, stability, cloud development, and precipitation. Water transport is followed through soil moisture, groundwater, and stream flow. Discussed methods focus on tracking water transport through the land- atmosphere system at various scales. Additional topics may include water quality, water resource management, and hydrology of selected landscapes.

Course Objectives

Students in this course will learn how to:

1. Understand atmospheric circulation, and how it is controlled by energy transfers and the fundamental properties of air.
2. Understand, analyze, and track the flow of water through evaporation, cloud formation, and precipitation.
3. Understand the hydrologic cycle and the water balance equation as a unifying framework for studying and managing freshwater.
4. Use various techniques to measure, model, or calculate streamflow and runoff within the hydrological cycle.
5. Identify reliable sources of scientific information, and construct knowledge from primary sources.

Online Meeting Schedule

Section	Meeting Time	Meeting Dates
LEC01	15:30 – 16:45	Jan. 12, 26, Feb. 9, 23, Mar. 9, 23, 30, Apr. 13.
LAB01	N/A	None - all asynchronous
LAB02	N/A	None - all asynchronous

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-learning outcomes to which they contribute, and the expected level of achievement.

Course Learning Outcomes	PLO(s)*	Level(s)**
Students should be able to explain global weather patterns	2	3
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 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

*PLOs = Program Learning Outcomes: 1 = reflect and communicate diverse human-environment perspectives, 2 = identify and explain human-environment processes, 3 = implement sampling, data collection, analyses and communication methods, 4 = analyze spatial and temporal aspects of human-environment systems, 5 = employ knowledge, arguments, and methodologies for solving human-environment problems, 6 = evaluate geospatial data and manipulate it to create cartographic products, 7 = communicate geographic concepts using oral, written, graphic, and cartographic modes, and 8 = demonstrate literacy skills.

**Levels: 1 = Introductory, 2 = Intermediate, and 3 = Advanced.

Prerequisites

Prerequisites: 3 units from Geography 211, 308.

Learning Resources

There is no required textbook for this course however, there are several texts/readings that are suggested. Some "recommended readings" will be posted on the course D2L site to supplement lecture material. Recommended resources are:

Weather & Climate: An Introduction. Ed Ross, Sheila Loudon. Oxford University Press, 2013. ISBN-10 0195445872, ISBN-13 978-0195445879.

https://books.google.ca/books?id=7HtEMQAACAAJ&source=gbs_book_other_versions

Hydrology & Floodplain Analysis, 6th Ed. Bedient, Huber & Vieux. Pearson 2019. ISBN-10 0134751973, ISBN-13 9780134751979.

<https://books.google.ca/books?id=48t7tAEACAAJ&dq=bedient+huber+and+vieux&hl=en&sa=X&ved=2ahUKEwio0o30-aLsAhXPJDQIHUoEBjAQ6AEwAXoECAAQAg>

Physical Hydrology (3rd Edition), by S. Lawrence Dingman:

https://books.google.ca/books/about/Physical_Hydrology.html?id=rUUaBgAAQBAJ&redir_esc=y

Learning Technologies and Requirements

In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology.

- A computer with a supported operating system, as well as the latest security and malware updates
- A current and updated web browser

- Webcam (built in or external)
- Microphone and speaker (built-in or external) or headset with microphone
- Broadband internet connection

In addition, there are two computer-based labs that can be completed on home desktops but will require you to download software (HEC-HMS, a hydrologic model). Assignments will require you to have access to Microsoft® Office products, specifically Excel and Word.

Grading (Weighting)

It is essential to pass the combined total of the laboratory reports, midterm and final exam(s) [50% of the total mark] to pass the course as a whole. Numbers in brackets indicate the number of deliverables equally weighted to determine the final assessment component.

Lab reports (5)	25
Problem sets (6)	20
BINGO Challenges (5)	10
Term Paper (1)	20
Midterm (1)	10
Final Exam (comprehensive) (1)	10
Final Exam (take-home) (1)	5
Total	100

Late Policy: Deliverables submitted after the stated deadline will be penalized at -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 a deliverable for legitimate reasons (as determined by the course instructor), 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. Unless otherwise indicated, all deliverables are due at 23:59 on the due date.

Grading System

96 – 100	A+	77 – 80	B	59 – 61	C-
90 – 95	A	71 – 76	B-	55 – 58	D+
86 – 89	A-	65 – 70	C+	50 – 54	D
81 – 85	B+	62 – 64	C	0 – 49	F

Lab Reports (25%)

There will be a series of 5 lab reports worth 5% of your mark each. This course typically involves hands-on experimental labs (EL), which are not possible in W2021 due to COVID-19 restrictions. Alternative delivery will include pre-recorded demonstrations of lab setup and execution, which is required viewing for students. Data from those demonstrations will be provided through D2L, which students will use to complete the lab assignment and write up.

Lab # & Topic	Assigned Date	Due Date [^]
Lab 1: water vapour	Jan 18/21	Jan 29/21
Lab 2: water balance	Feb 1/21	Feb 12/21
Lab 3: groundwater	Feb 22/21	Mar 5/21
Lab 4: rainfall-runoff	Mar 8/21	Mar 19/21
Lab 5: snow hydrology	Mar15/21	Mar 26/21

[^]all deliverables are due at 23:59 on the date indicated.

Lab write-ups will be collaborative written assignments (i.e., one submission per lab group); lab groups will be assigned by the instructor. Students are expected to contribute equally, and an individual assessment of

each lab group member will be (confidentially) completed at the end of term that will be used to 'adjust' individual student marks for the labs based on lab member participation and contributions to the group assignment. Lab reports are expected to include an introduction/background section, methods, observations, results and discussion which provide responses to all laboratory questions. Supporting calculations are to be provided in appendix, or as a separate file (e.g., Excel spreadsheet). Complete and professional submissions (i.e., proof read) are expected for full marks. All lab reports and accompanying material (calculations) must be submitted in a D2L compatible format (i.e. .pdf, .docx or .xlsx). Students will have two weeks to view the lab demo and complete their lab reports.

Problem Sets (20%)

Problems sets will accompany two computing labs (CL), which students can access and complete on home-based computing systems and four Do-It-Yourself at-home experiments (DIY), designed to increase tangible learning during COVID-19. At-home experiments will use common household materials and will be accompanied by step-by-step instruction sheets. For the DIYs, students are expected to follow (and submit) proper experimental note-taking protocols (hypothesis, materials, observations, and results), followed by solutions and analysis of the accompanying problems. Submissions are individual, but collaborative discussion and learning is encouraged; all collaborators must be acknowledged on the first page of the submission. Students will have 1 week to complete DIY labs after they are assigned; they will be due the following Monday.

Prob. Set& Topic	Assigned Date	Due Date [^]
DIY1: condensation	Jan 25/21	Feb 1/21
DIY2: rainfall-runoff	Mar 1/21	Mar 8/21
DIY3: sublimation	Mar 15/21	Mar 22/21
CL1: HEC-HMS I	Mar 29/21	Apr 9/21
DIY4: random probability	Mar 29/21	Apr 6/21
CL2: HEC-HMS II	Apr 2/21	Apr 15/21

[^]all deliverables are due at 23:59 on the date indicated.

BINGO Challenge (10%)

Each student must complete a set of 5 BINGO challenge cards, worth 2% of your mark each, throughout the term. At least four of the five cards must be related to a specific topic/module of the course, with the opportunity to select ONE additional card from three "open-ended" challenges posted at the start of term. Each challenge requires a student to complete "4 in a row" (horizontal, vertical or diagonal), and to submit proof of completion as requested on the card (e.g., photos, GPS coordinates, descriptions, etc.). These challenges are designed to provide tangible learning opportunities during COVID-19. Students may complete and submit additional BINGO challenges to earn up to 2% bonus marks per additional BINGO challenge submitted.

BINGO challenges are due no later than the final day of class (Apr 15, 2020 @ 23:59) but may be submitted at any time.

Term Paper (20%)

Students will be asked to write one OPEd (or Opinion Editorial) that is rooted in scientific fact and literature, presenting a higher-level analysis (a personal commentary/opinion) of a contemporary water-related issue of interest to the student. Submissions are individual papers. Although OpEds do not have a "right or wrong" answer (as they are commentaries), students are expected to provide credible, peer-reviewed evidence in support of their argument(s). Students may select the topic of their OPEd themselves, based on their own interests. The only requirement is that it is "water" related. This can include policy, political, resource governance, social, economic, and other aspects of water.

Materials and resources on how to write an effective OpEd will be provided to students through the course

D2L, but students are encouraged to do their own research in addition. The heuristic/rubric to be used for evaluation is available on the course D2L; it is highly encouraged that students review the marking scheme. **Term papers are due on the final day of class (April 15, 2020 @ 23:59).**

Midterm (10%) & Comprehensive Final Exam (10%)

Exams will be open-book, online tests. The exams are designed to be 75-minutes, respectively, but students will be allotted 50% more time to complete the online test (specific details to be given prior to the exams). Exams will be accessed through D2L. It is expressly forbidden (and considered cheating, or academic misconduct) to converse with classmates, or others, during the duration of these exams. You will be given a 24-hour period to complete the midterm during the 8th week of class (starting 8 AM March 10th and ending 07:59AM March 11th); and the comprehensive final exam will be scheduled by the registrar's office during the official exam period (Apr. 19, 2020 or after).

If a student is unable to write the midterm test for "valid reasons" (i.e., medical or compassionate), the weight of the term test will be added to the comprehensive final examination component of the evaluation. A student who is unable to write the midterm test must inform the instructor before the start of the test, whenever possible.

Take-home Final Exam (5%)

On the final day of classes, students will be assigned a take home final exam in which they must build a HEC-HMS model based on custom inputs. **Each student will be required to build their own model; model's will be unique to each student.** Students will be required to justify their choices in constructing the model (e.g., selection of equations and parameters) in a short and succinct write up and will be required to provide output of their working model design (i.e., resulting hyeto- and hydrographs), as well as their model setup. The take-home final exam will be due at the end of the examination period (**April 29 @23:59**). For this exam, and lab assignments throughout the term, it is a requirement for you to download and install for use the HEC HMS hydrologic model from the U.S. Army Corps of Engineers (<https://www.hec.usace.army.mil/software/hechms/>).

For additional detailed course information posted by the instructor, visit the course Desire2Learn page online at <https://d2l.ucalgary.ca/d2l/home>.

SUPPLEMENTAL INFORMATION

Principles of Conduct

The University 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 university property. This statement applies in all situations where members of the university community are acting in their university capacities. All members of the university community have a responsibility to familiarize themselves with the principles of conduct statement, which is available at: www.ucalgary.ca/pubs/calendar/current/k.html.

Plagiarism, Cheating, and Student Misconduct

The University of Calgary is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect.

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 at: www.ucalgary.ca/pubs/calendar/current/k-3.html. 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 adequate citation, and (3) using work completed for another course. Such activities will not be tolerated in this course, and students suspected of academic misconduct will be dealt with according to the procedures outlined in the calendar at: <https://ucalgary.ca/policies/files/policies/student-academic-misconduct-procedure.pdf>

Instructor Intellectual Property

Information on Instructor Intellectual Property can be found at <https://www.ucalgary.ca/policies/files/policies/Intellectual%20Property%20Policy.pdf>

Freedom of Information and Protection of Privacy

Freedom of Information and Protection of Privacy (FOIP) legislation in Alberta disallows the practice of having students retrieve assignments from a public place, such as outside an 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 must provide the instructor with a stamped, self-addressed envelope to be used for the return of the assignment.

Human subjects

Students will not be expected to participate as subjects or researchers in this course; there is no research on human subjects in this course.

Guidelines for Zoom Sessions

Zoom is a video conferencing program that will allow us to meet at specific times for a "live" video conference, so that we can have the opportunity to meet each other virtually and discuss relevant course topics as a learning community.

To help ensure Zoom sessions are private, do not share Zoom link or password with others, or on any social media platforms. Zoom links and passwords are only intended for students registered in the course. Zoom recordings and materials presented in Zoom, including any teaching materials, must not be shared, distributed or published without the instructor's permission.

The use of video conferencing programs relies on participants to act ethically, honestly and with integrity; and in accordance with the principles of fairness, good faith and respect (as per the [Code of Conduct](#)). When entering Zoom or other video conferencing sessions (such as MS Teams), you play a role in helping create an effective, safe and respectful learning environment. Please be mindful of how your behavior in these sessions may affect others. Participants are required to use names officially associated with their UCID (legal or preferred names listed in the Student Centre) when engaging in these activities. Instructors/moderators can remove those whose names do not appear on class rosters. Non-compliance may be investigated under relevant University of Calgary conduct policies (e.g. Student Non Academic Misconduct Policy). If participants have difficulties complying with this requirement, they should email the instructor of the class explaining why, so the instructor may consider whether to grant an exception, and on what terms. For more information on how to get the most out of your Zoom sessions visit: <https://elearn.ucalgary.ca/guidelines-for-zoom/>.

If you are unable to attend a Zoom session, please contact your instructor to arrange an alternative activity for the missed session (e.g., to review a recorded session). Please be prepared, as best as you are able, to join class in a quiet space that will allow you to be fully present and engaged in Zoom sessions. Students will be advised by their instructor when they are expected to turn on their webcam (for group work, presentations, etc.).

The instructor may record online Zoom class sessions for the purposes of supporting student learning in this class – such as making the recording available for review of the session or for students who miss a session. Students will be advised before the instructor initiates a recording of a Zoom session. These recordings will be used to support student learning only and will not be shared or used for any other purpose.

Posting of Grades and Picking-up of Assignments

Graded assignments will be made available electronically through the course D2L webpage. Grades and assignments will not be available at the Department of Geography main office.

Academic Accommodations

It is the student's responsibility to request academic accommodations, according to the university policies and procedures listed in the University Calendar.

The student accommodation policy can be found at: https://www.ucalgary.ca/policies/files/policies/student-accommodation-policy_0.pdf

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: www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf.

Students needing an accommodation based on a protected ground other than disability should communicate this need, preferably in writing to their instructor or the Department Head (email: david.goldblum@ucalgary.ca).

Copyright Legislation

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright <https://www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright-policy.pdf>

and requirements of the copyright act (<https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html>) to ensure they are aware of the consequences of unauthorised sharing of course materials (including instructor notes, electronic versions of textbooks etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Act.

Wellness and Mental Health Resources

The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness, and academic success and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support, or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, <https://www.ucalgary.ca/wellnesscentre/services/mental-health-services>) and the Campus Mental Health Strategy website (<http://www.ucalgary.ca/mentalhealth/>).

Contact Information for Student and Faculty Representation

- Student Union VP Academic 403-220-3911, suvpaca@ucalgary.ca
- Students Union Representatives for the Faculty of Arts – 403-220-3913, arts1@su.ucalgary.ca, arts2@su.ucalgary.ca, arts3@su.ucalgary.ca, arts4@su.ucalgary.ca
- Student Ombuds Office information can be found at: www.ucalgary.ca/ombuds/

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 station, 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.

Online meeting schedule Section Meeting Time Meeting Dates LEC 01 TuTh Required synchronous sessions:
Sep 8, Oct 20, Oct 27, Nov 3, Nov 17, Nov 26, Dec 3 LAB 01-02 M 11am, T 2pm

Optional synchronous sessions (recorded): Sep 21, 22; Oct 5, 6, 26, 27; Nov 16, 17, 30; Dec 1