

GEOG 508 LEC01 Watershed System Science

GFC Hours 3-2

Fall 2022 classes: September 6th – December 7th, 2022

Section	Days	Time	Location
LEC 01	TR	9:30-10:45AM	ES920
B01	W	11:00-12:50PM	ES355
B02	R	2:00-3:50PM	ES355
Instructor: Dr. Tricia Stadnyk		Office:	
Telephone:		Email:	
Email communication will be through your UCalgary email address.		Office hours:	

The **Department of Geography** condemns the longstanding and continued injustices against those marginalized by racism, sexism, homophobia, transphobia, classism, xenophobia, able-bodied normativity, mental health profiling, and other forms of prejudice. We are pained by the fact that injustices are unevenly borne. <https://arts.ucalgary.ca/news/anti-racism-statement>

Territorial Acknowledgement

The Department of Geography would also like to acknowledge the traditional territories of the people of the Treaty 7 region in southern Alberta. The City of Calgary is also home to Métis Nation of Alberta, Region III. <https://www.ucalgary.ca/indigenous/cultural-protocol>
The instructor would like to acknowledge this land is known to the Blackfoot people as *Mohkinstis*, where the Elbow meets the Bow.

Official Course Description

Introduction to advanced concepts in hydrology and watershed analysis, including the impacts of a changing climate and human influence. Involves hands-on computer modelling and experimental labs, and a design project.

Course Objectives

Students in this course will 1) advance their knowledge of concepts in hydrology and water resources management, 2) apply geo-spatial, hydrologic and hydraulic models to simulate water transport, 3) assess human impacts to water movement across natural landscapes, and 4) understand water policy in the Canadian context, including transboundary agreements and Indigenous water rights.

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 understand advanced hydrologic concepts and water resources management principles	1,2,3,4	3
Students are expected to understand the role of climate change in altering watershed systems	1,2,5	3
Students should be able to apply geospatial, hydrologic and hydraulic models to solve a water resources problem	3,4,5,6,7	2
Students should understand and appreciate the human impacts to natural water systems	2,3,4	2
Students should know Canadian water policy and be able to apply water management decision-making criteria	5,8	2
Students should be familiar with the concepts around Indigenous water rights	1-2,8	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

Consent of the Department. Fundamental hydrology or water resources course from applicable department of students major (as assessed by course instructor).

Course Format

Format will be in-person for classes and labs.

An optional field trip (not for credit) will be made available to interested students (transportation will be provided); this will be held outside regularly scheduled class time.

Final poster presentation day on December 7, 2022 will require student participation potentially outside of regular scheduled lab times (for B02 Section students) and may extend longer than the pre-defined lab time. Accommodations will be made for students with course conflicts in other classes.

Learning Resources

No required textbooks; optional readings in support of lecture material will be provided for each section of the course.

Assessment Methods

Labs	35	1 week after lab session
Project	35	December 7, 2022
Final Exam (comprehensive, Registrar scheduled)	30	Registrar scheduled
Total	100	

It is a requirement to pass all components of the course to pass the course as a whole. Late policy will be -10% per day (including weekends) up until the student receives a mark of zero and/or the TA posts the solutions.

Labs (35%)

There are mandatory, weekly lab periods in this course. They must be attended in person to get credit for the course and course deliverables. An outline of all lab sessions is provided below:

- Lab 1 CL. Discussion on Water Conflict
- Lab 2 CL. Project Presentation AND Hydrometeorological Data
- Lab 3 EL. Water balance & hydrographs
- Lab 4 CL. Watershed delineation & GIS
- Lab 5 CL. Introduction to Hydrologic Modelling: HEC-HMS
- Lab 6 CL. Introduction to Hydraulic Modelling: HEC RAS
- Lab 7 EL. Geomorphology
- Lab 8 EL. Sediment Transport
- Lab 9 EL/CL. Floodplain Mapping
- Lab 10 CL. Water Management Role Play Game Intro
- Lab 11 PROJECT TIME
- Lab 12 PROJECT TIME
- Lab 13 PROJECT PRESENTATION DAY

This course will involve hands-on experimental labs (EL) as well as computing-based labs (CL) designed to build analysis tools for students, which are highly relevant to industry and completion of their term project.

Computer labs (CL) are designed to teach tools that will support more advanced hydrologic analysis, and analysis of data collected in the hands-on labs. They will be conducted in a computer lab where the course instructor and TA's will be present to assist. Step-by-step instructions will accompany a short introduction to the lab assignment; results are to be handed in and evaluated on an individual basis 1 week following the lab session (at the start of the next lab section). Hands-on experiment labs (EL) will be completed in ES355 in pre-assigned groups at designated times. Each experimental lab will take 30-45 minutes to complete, and a group lab report must be completed and handed in 1 week following the experiment.

Lab write-ups must include:

- Raw data, including photos taken during the lab experiment
- Answers to all given questions
- Written responses to questions and sample calculations.
- Explanations for the reasons given results were obtained (i.e., analyses) are required.

All group members must sign their name, beside which should be indicated their percentage contribution to the lab. Individual lab marks will be weighted according to this percentage.

Students are expected to conduct themselves in a safe, and professional manner during these lab times and adhere to all guidelines for safe practice laid out by the lab technician and TAs in charge.

Project (35%)

Goal: Apply skills and tools taught in the course to solve a real-world hydrology problem

Topic: TBA

To be completed in teams of 2-4 students (selected by students).

Term deliverables (20%): Four deliverable check points (worth 5% each) are established throughout the term to evaluate project milestones, student progress, project management, and provide interim feedback on team dynamics. Each deliverable will have specific requirements to be met, which includes an oral summary of work done by each team member, and review of digital model output (no report required, format will be in-person meeting to review progress with instructor). Evaluation will be based not on correctness, but on level of effort and due diligence in attempting to complete the deliverable. A meeting sign-up schedule will be posted for each week of the deliverable; teams are expected to select a time/date to meet with the instructor or will receive a mark of zero.

Team contracts	Team name + member summary	September 16 th
Deliverable 1	Project completion plan and timelines	October 3 rd
Deliverable 2	GIS framework & delineation	October 17 th
Deliverable 3	Hydrologic model setup	October 31 st
Deliverable 4	Hydraulic model setup	November 21 st

Summary Report (30%): Maximum 15 pages (1.5 spacing, 12 pt standard type font): includes front matter (abstract, cover letter, table of contents, list of figures and tables), main body with clear and logical sub-sections, and references (in APA format). Minimal appendices will be accepted (5 pages max). Reports not meeting an acceptable professional standard will not be accepted. Reports due on the final day of class.

Oral Presentation (50%): Using the feedback from the oral presentation, teams will prepare and present an interactive poster board display of their project results to the instructor and TAs. Teams should prepare and

rehearse a 10-12 minute oral presentation of their poster for the project sponsors, and be prepared for 3-5 minutes of questions.

Project guidelines, technical materials, supporting materials, report templates (i.e., cover letter), and evaluation sheets provided on course website.

Final Exam (30%)

A 120-minute final (comprehensive) exam will be scheduled by the registrar during the exam period worth 30% of the final mark. Tests will be open book; students may use the formula sheet provided in class.

Grading System

92 – 100	A+	74 – 77	B	59 – 61	C-
86 – 92	A	70 – 73	B-	55 – 58	D+
81 – 85	A-	65 – 69	C+	50 – 54	D
78 – 80	B+	62 – 64	C	0 – 49	F

Additional Course Information

Classroom Expectations – What I expect from you

1. *Contract*: Students are expected to read and understand the course syllabus. By remaining in the class, you agree to be subject to the “terms of this contract”.
2. *Classroom Environment*: All students attending classes have the right to learn. Students are expected to actively and constructively participate in the learning environment. I will be in class for 5 minutes prior to and after the class time. I will treat you with respect and would appreciate the same courtesy in return.
3. *Collaborative Learning*: Working together is encouraged, but all contributors must be acknowledged at the beginning of the assignment. I expect you to behave professionally in that ideas are worth something: if someone helps you, have the courtesy to acknowledge them.
4. *Participation*: A large part of my teaching practice includes the use of questions and discussion in class. I do not expect perfection, but I do expect students to respond and constructively participate to enhance collective learning opportunities.
5. *Feedback*: Students are encouraged to provide feedback, both positive and constructive suggestions for improvement, throughout the term, which will be used to improve the teaching and/or material presented in this course.

Classroom Expectations – What you can expect from me

1. *Environment*. I will create a safe, inclusive learning environment for all, where we can all benefit from each others diversity of background and experience.
2. *Feedback*. I will conduct at least one formative feedback assessment during the term – I encourage feedback on the course and my teaching for continuous improvement.
3. *Pace*. You can expect that I may adjust the pace and content of the course to ensure the material is *learned* and not just taught.
4. *Availability*. You can expect that I will be available during office hours, and that I will maintain an open-door policy so long as students remain respectful of my time. I endeavour to respond to student emails within 24 hours of receipt, unless the class is otherwise notified.
5. *Transparency*. Grading will be conducted in a fair, quantitative manner with rubrics and/or evaluation criteria posted prior to all due dates. Assessment criteria will be transparent.

In the event that a student misses an exam, course deliverable, or any course work due to illness, supporting documentation, such as a medical note or a statutory declaration may be requested at the discretion of the course instructor. <https://www.ucalgary.ca/pubs/calendar/current/m-1.html>

Please refer to <https://www.ucalgary.ca/registrar/registration/appeals/student-faq> for frequently asked questions concerning the provision of a medical note/statutory declaration.

Exams & Deferrals <https://www.ucalgary.ca/registrar/exams>

Supplementary Fees

Not applicable

Referencing Standard

In written work presented in this class, the accepted method for referencing the work of others will be the Chicago Manual of Style: <https://www.chicagomanualofstyle.org/home.html>

Important Dates

The last day to drop this course and receive a tuition fee refund is **Thursday, September 15th, 2022**. The last day to add or swap a course for Fall 2022 is **Friday, September 16th, 2022**. The last day to withdraw from this course is **Wednesday, December 7th, 2022**. Please note that the University is closed on Friday, September 30th; Monday, October 10th; and Friday, November 11th, 2022.

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

Resources and Writing support

Please note writing support resources provided by the Student Success Centre <https://ucalgary.ca/ssc/resources/writing-support> and the library <https://libguides.ucalgary.ca/guides/>

University of Calgary Academic Integrity Policy

Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity. 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://www.ucalgary.ca/legal-services/university-policies-procedures/student-academic-misconduct-procedure>

For students wishing to know more about what constitutes plagiarism and how to properly cite the work of others, the Department of Geography recommends that they attend Academic Integrity workshops offered through the Student Success Centre: <https://www.ucalgary.ca/student-services/student-success/learning/academic-integrity>

Instructor Intellectual Property

Information on Instructor Intellectual Property can be found at <https://www.ucalgary.ca/legal-services/university-policies-procedures/intellectual-property-policy>

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.

Posting of Grades and Picking-up of Assignments

Graded assignments will be returned by the instructor or teaching assistant personally during scheduled lecture or laboratory periods, unless they are made available electronically through the course D2L webpage. Grades and assignments will not be available at the Department of Geography's main office and assignments cannot be dropped off at the Department 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/pubs/calendar/current/b-6-1.html>

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: <https://www.ucalgary.ca/legal-services/university-policies-procedures/accommodation-students-disabilities-procedure>

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: freeman@ucalgary.ca).

Online courses

Students are expected to attend all lectures and laboratory sessions IN-PERSON to complete this course successfully.

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 updates web browser
- Webcam (built in or external)
- Microphone and speaker (built in or external) or headset with microphone
- Broadband internet connection
- HEC-HMS hydrologic model (<https://www.hec.usace.army.mil/software/hec-hms/downloads.aspx>)
- HEC-RA hydraulic model (<https://www.hec.usace.army.mil/software/hec-ras/download.aspx>)
- QGIS (<https://www.qgis.org/en/site/>)
- Microsoft Office (Word and Excel)

Use of internet and electronic devices in class

Respect for the learning environment of you and your classmates is paramount. Therefore, I ask that laptops, mobile devices or other electronic devices are used appropriately – for classwork only – and will not be permitted if they become a distraction (i.e., the instructor will remove them or ask you to leave).

Course evaluations and student feedback

Continuous feedback is highly encouraged and welcomed in this course. The instructor will conduct no less than one formative feedback assessment during the term, providing students the opportunity to provide critical feedback that will be used to adjust learning goals, deliverables and modes of delivery. If necessary, more than one formative feedback will be used to collect student input. Student feedback will be sought at the end of the course through the standard University Student Ratings of Instruction (USRI) and Faculty course evaluation forms.

Accessibility

All lecture materials will be provided online, through the D2L LMS, in digital format (PDF files). Video recordings of lectures will NOT be available, unless the instructor must be absent (students notified in advanced).

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/legal-services/university-policies-procedures/acceptable-use-material-protected-copyright-policy> 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/>).

Students requiring assistance are encouraged to email the **Student at Risk line** if they or others appear to need wellness assistance: sar@ucalgary.ca For more immediate response, please call: 403-210-9355 and select option #2.

Sexual Violence Policy

The University recognizes that all members of the University Community should be able to learn, work, teach and live in an environment where they are free from harassment, discrimination, and violence. Please see the policy available at <https://www.ucalgary.ca/legal-services/university-policies-procedures/sexual-and-gender-based-violence-policy>

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/

Emergency Evacuation/Assembly Points

Assembly points for emergencies have been identified across campus. Assembly points are designed to establish a location for information updates from the emergency responders to the evacuees; from the evacuated population to the emergency responders. For more information, see the University of Calgary's Emergency Management website: <https://www.ucalgary.ca/risk/emergency-management> Muster point is ICT food court

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.