UNIVERSITY OF CALGARY

GEOG 647 – Advanced Research & Applications in GIS
Winter 2023 (2024/1/8 - 2024/4/9)
Class Number 10339

Section	Days	Time	Location
LEC 01	Tuesday - Thursday	11:00AM – 12:15PM	ES 415
LAB B01	Wednesday	3:30 – 6:15PM	ES 415

Instructor: Darren Bender	Office: Earth Science 338
Telephone: 403.220.6398	Email: dbender@ucalgary.ca
All course communication will be through the Microsoft Teams platform.	Office hours: By appointment via Microsoft Teams

*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

Official Course Description
Focus on advanced GIS applications in core areas; methodological developments in GIS, & current research directions in GIS.

Course Objectives
This course is designed for students with strong GIS knowledge and skills. It examines advanced topics in GIS such as geodatabase design, enterprise GIS, web GIS and distributed GIS, designing GIS workflows, automating workflows, GIS scripting, and advanced spatial modelling techniques. The course will also provide learning opportunities for students to explore advanced topic areas that are of personal interest – each student will be given the opportunity to choose special topic areas to pursue individually, which will include an oral presentation and student-led classroom discussion.

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)**
Design and implement automated GIS workflows.	3, 4, 7	1, 2
Construct, execute, and interpret multi-criteria geospatial models.	3, 4, 5, 6, 7	2, 3
Create and deploy web-based GIS maps and services.	3, 6, 7	3
Design and deploy online geospatial dashboards and analytics.	3, 4, 7	2
Create, maintain, and visualize geographic data using enterprise GIS systems.	3, 6, 7	2
Design, populate, and manage enterprise-based multi-user geodatabases.	3, 5	2
Research an advanced topic area in GIS and describe its use and value to users.	4, 6, 7, 8	3
Prepare and deliver an oral presentation that effectively teaches and advanced concept, technique, and/or research area in the field of GIS.	4, 6, 7, 8	3

*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 – normally restricted to students enrolled in the MGIS Program. Students must have strong GIS skills, such as the skills obtained in courses like GEOG 607 or GEOG 682, and they must be proficient with the ArcGIS Pro software suite.

Course Format
Unless government- and university-imposed public health measures are reintroduced, all classes and laboratories will be offered synchronously and in-person.

This course will use a blended learning approach that combines online lecture materials with in-person lecture sessions with your instructor. The Microsoft Teams for Education online learning management system will be used to deliver online course materials and course administration (e.g., assignments, gradebook, group chats, etc.). *Note that Microsoft Teams will replace Desire2Learn (D2L) for the delivery of online content in this course.*

Learning Resources
There is no required textbook for this course. Required readings will be made available and will draw from academic articles, technical documentation, and industry white papers.

Important Dates
The last day to drop this course and receive a tuition fee refund is 18 January 2024. The last day to add or swap a course for the winter term is 19 January 2024. The last day to withdraw from this course is 9 April 2024. Please note that the University is closed on 19 February (Family Day holiday), 29 March (Good Friday), and 1 April 2024 (Easter Monday).

Grading (Weighting)
The following evaluation components will be used to determine the overall grade in this course.

Component 1 – Examinations & In-class assignments:

Midterm exam (closed-book, in-class test 14 March)	15%
End-of-term oral test (individually scheduled for 15 – 17 April)	15%
In-class assignments (worksheets, quizzes, etc.)	5%

Component 2 – Lab assignments & participation:

GIS lab assignments (weights vary with each assignment)	30%
Class participation and engagement	5%

Component 3 – Term project assignment:

Project proposal presentation (19 – 21 March)	5%
Oral presentation (individually scheduled for 2 – 4 April)	10%
Term project report (due by 11:59 pm on 9 April)	15%

Note: To successfully pass this course, students must earn a passing grade for each of the Evaluation Components 1, 2, and 3 above (see Grading System below). Students must also successfully complete all lab assignments to receive a passing grade in Component 2.

Details about each evaluation component, such as lecture topics, assignment topics and deadlines, participation expectations, etc., will be provided electronically on Microsoft Teams at the beginning of the course.

All assignment submissions must be completed online using the Assignments tool in the Microsoft Teams platform. Other forms of submissions (e.g., email submissions, submissions by private chat message) will not be accepted.

There is no registrar-scheduled final exam for this course, but students will complete an end-of-term oral exam at the end of the term. An online booking system on Microsoft Teams will be available to schedule a date and time for each student to meet with the instructor to complete the exam. The oral exam is closed-book.

Late Assignments and Missed Evaluations
Late assignments will be assessed a penalty of 2% per hour or portion thereof past the assignment deadline. If you anticipate that you will not meet a deadline for an assignment, contact your instructor or teaching assistant at least one business day before the deadline to discuss whether an extension can be granted. No extensions will be provided after the deadline, except in extenuating circumstances at the instructor's discretion; students may be required to provide supporting documentation, such as a statutory declaration (see the University Calendar – Academic Regulations section *M.1 Supporting Documentation and the Use of a Statutory Declaration*).

Assignment solutions are typically reviewed by the instructor immediately following the assignment due date. Thus, no late submissions will be accepted beyond when the assignment solution was discussed.

Missed exams or assignments will earn a grade of 0%. If a student has missed a required component of the course, they must contact the instructor immediately to discuss whether accommodations can be made. If extenuating circumstances contributed to a missed component, accommodations might include options such as waiving the component and reweighting of the overall course grade (see the University Calendar – Academic Regulations section *G.1.1 Course Assessments and Absences for Procedures on Missed Term Tests and Assignments*).

Grading System
The following grading system will be used:

98 – 100	A+	80 – 84	B	60 – 64	C-
94 – 97	A	75 – 79	B-	55 – 59	D+
90 – 93	A-	70 – 74	C+	50 – 54	D
85 – 89	B+	65 – 69	C	0 – 49	F

Note: All grades of "C+" or lower are indicative of failure at the graduate level and cannot be counted toward Faculty of Graduate Studies course requirements.

Flexible Grade Option (CG Grade)
See: https://www.ucalgary.ca/pubs/calendar/current/f-1-3.html

Supplementary Fees
Not applicable.

Additional detailed course information will be posted by the instructor on the course workspace on Microsoft Teams. An invite to the Teams workspace for this course will be provided by the instructor in the first lecture.

SUPPLEMENTAL INFORMATION

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.

Human subjects
Students will not participate as subjects or researchers on human subjects in this course.

Internet and electronic communication device information
Students will use classroom computers heavily during the lecture periods of this course, especially ArcGIS software. Students are welcomed to bring personal laptops and other electronic devices into the classroom, provided they do not disturb or distract other students or the instructor (e.g., please remember to turn off cell phone ringers/notifications while in class).

Referencing Standard
In written work presented in this class, the two accepted methods for referencing the work of others will be (1) Chicago Manual of Style: https://www.chicagomanualofstyle.org/home.html or (2) American Psychological Association: https://apastyle.apa.org/products/publication-manual-7th-edition .

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/

Exams & Deferrals
Exam deferrals are granted with a legitimate reason, e.g., illness and scheduling conflicts due to work and/or extra-curricular activities. Please inform the instructor in advance via e-mail or in person to reschedule.
 https://www.ucalgary.ca/registrar/exams

Posting of Grades and Picking-up of Assignments
Graded assignments will be returned electronically through the course workspace on Microsoft Teams. Exams will be returned in class by the instructor. Exams 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).

Documentation for Absences or Missed Course Assessments
Students who are absent from class assessments (tests, participation activities, or other assignments) should inform the instructor as soon as possible. Instructors may request that evidence in the form of documentation be provided. If the reason provided for the absence is acceptable, instructors may decide that any arrangements made can take forms other than make-up tests or assignments. For example, the weight of a missed grade may be added to another assignment or test. For information on possible forms of documentation, including statutory declarations, please see https://www.ucalgary.ca/pubs/calendar/current/m-1.html.

Copyright Legislation
All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright https://ucalgary.ca/legal-services/university-policies-procedures/acceptable-use-material-protected-copyright-policy and requirements of the copyright act at (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.

Course evaluations and student feedback
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.

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. In case of emergencies and fire drills, please note the ICT Food Court is the assembly/muster point.

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.