

GEOG 482 LEC01 Geographic Information Systems

GFC Hours 3-2

Winter 2024 classes: January 8th – April 9th

Section	Days	Time	Location
LEC L01	Tuesday & Thursday	9:30-10:45	SB 105
LAB B01	Thursday	11:00-12:50	ES 307
LAB B02	Tuesday	14:00-15:50	ES 407

Instructor: Dr. Darren Sjogren	Office: ES 456
Telephone: 403-220-2575	Email: sjogren@ucalgary.ca (contact through D2L)
Email communication will be through your UCalgary email address.	Office hours: Wednesdays 13:00-14:00, or by appointment.

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

The technical and theoretical foundations of Geographic Information Science. Explorations of data types and structures, data integrity, metadata, data acquisition and maintenance, analytical techniques, and methods for geovisualization will be explored in lecture and laboratory.

Course Objectives

This intermediate-level course about geographic information systems (GIS) focuses on geospatial data management and spatial analytics for continuous and discrete geographic features. Lecture material will emphasize Geographic Information Science (GISci) as a foundation that guides GIS data collection, analysis, and visualization. Students will become skilled at using industry-standard GIS software, such as the ArcGIS Pro® software suite, through weekly computer laboratory exercises and online training.

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)**
By completing this course, a successful student will be able to:		
Explain the two dominant models of geographic representation (discrete entities and continuous fields) and describe their relationship to the common spatial data models used in geography (raster and vector datasets).	3, 6	2
Describe the fundamental components of a vector dataset, including why topology is useful for data validation, analysis, and editing.	6	3
Describe the fundamental structure of a raster dataset, including multi-band and multi-dimensional data structures.	6	3

Recognize common coordinate systems and map projections, and appropriately transform geographic data between different coordinate systems and projections.	6	2
Acquire spatial data from public and institutional sources, distinguishing datasets captured from primary and secondary sources.	3	2
Assemble related spatial datasets and create and maintain geographic databases to manage these data in a geographic information system (GIS).	3	2
Identify sources of uncertainty in geographic data, trace their propagation through various forms of spatial analysis, assess and visualize their impacts on analytical outputs, and interpret results recognizing the effects of uncertainty	6	1
Recognize and describe the role of relational database management systems in GIS.	6	1
Competently employ the ArcGIS Pro® software package to manage, analyze, and visualize geographic data.	4, 6, 7	2
Apply principles of Geographic Information Science (GISci) to select and utilize various GIS analysis techniques related to query, measurement, and transformations.	4, 6, 7	2
Apply principles of map design to create cartographic products that effectively communicate the results of GIS operations.	6, 7	2
Describe legal and ethical considerations about the use and dissemination of spatial information and GIS products.	3, 7, 8	1

**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

3 units from GEOG 231, 380

Course Format

All components are offered synchronously. There will be no video lectures or video lab introductions except in case of sickness or University of Calgary policy changes.

Lecture periods will be a combination of lecture, discussions, group activities. A non-technical introduction to the lab exercises will be provided. Students are expected to attend the lecture periods as the content delivered & discussed will be the material assessed on the midterm and final exams. The midterm exam will take place during the lecture period and the final exam is scheduled by the Registrar.

Lab periods will consist of a technical introduction by the teaching assistant and the remaining time for working on the lab and asking questions of the teaching assistant. Students are expected to attend the lab! The teaching assistant will grade all the labs under supervision of the instructor. If students are unable to attend their scheduled lab period, they are welcome to attend the other lab period as long as they do not take a computer away from a student who is registered in that section. Some weeks will not have a scheduled lab period but will, rather, consist of an online web course. During these weeks, students are welcome to use the computer lab room to complete. The teaching assistant will grade the deliverables for these web courses. All lab materials will be submitted through D2L.

Learning Resources

The following textbook is **required**. Testable readings will be provided out of this text.

Chang, K. 2019. *Introduction to Geographic Information Systems, 9th Edition*. McGraw Hill: New York, NY. 466 pp.

Required readings from other sources may be assigned – notifications will be posted online. Additional readings will not require purchase and will be available through the UofC Library.

Important Dates

The last day to drop this course and receive a tuition fee refund is **Thursday, January 18th, 2024**. The last day to add or swap a course for Winter 2024 is **Friday, January 19th, 2024**. The last day to withdraw from this course is **Wednesday, April 9th, 2024**. Please note that the University is closed on **Monday, February 20th** for Family Day. Term break is **February 18th – 24th**. The University is closed **Friday, March 29th** and **Monday, April 1st** for Easter.

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

Assessment Methods

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

Component #1 – Graded by Instructor

Midterm (15 February 2024 – during the lecture period)	10%
Final exam (Registrar scheduled)	20%
Lab Final (09 April 2024 – during the lecture period)	10%
Lab Peer-evaluation	10%

Component #2 – Graded by Teaching Assistant

Online Training	10%
Lab assignments	40%

Notes:

1. There **IS** a registrar scheduled final exam in this course. The date, time, and place of writing will be provided by the Registrar later in the term and will be available in your Student Centre.
2. To successfully pass this course, students must earn $\geq 50\%$ for both Components indicated above. Students do NOT need to pass every element within the component, just the component overall. This means 25/50 for Component #1 and 25/50 for Component #2. If a student receives $\geq 50\%$ on both Components, the final percent grade will be calculated using the weighting indicated above. The final letter grade will be determined using the Grading System below.
3. Late submissions will be accepted at a penalty of 10% per calendar day, or any portion thereof, past the deadline. See explanation below.
4. Only pens, pencils and erasers are allowed in exams. All electronic devices (including watches) must be on silent, stowed in a backpack (or equivalent), and either placed at your feet or at the side of the room during exams.

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

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

Supplementary Fees

There are no supplementary fees associated with this course.

Late Assignments and Missed Tests

- THERE WILL BE NO MAKEUP OR DEFERRED MIDTERM OR LAB EXAM under any circumstances. No examinations may be written early. Students who do not write the Midterm or the Lab Exam will have the weight of the missed exam shifted to the Final Exam. A statutory declaration for a missed midterm or lab exam is not required.
- Students are required to complete several assignments in this course. A due date and time will be posted for each assignment, and these deadlines are strict. If extenuating circumstances arise that will prevent you from completing an assignment by the deadline, contact your instructor **AND** 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. Late submissions will be accepted at a penalty of 10% per calendar day, or any portion thereof, past the deadline (e.g., up to 24 hours late = 10% penalty, 24+ hours late = 20% penalty, 48+ hours late = 30% penalty, etc.).
- All assignments must be submitted online following the instructions provided. Submissions which do not follow the instructions will receive a "0%" (e.g., email submissions will not be accepted).

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

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.

Use of internet and electronic devices in class

Use of the internet and electronic devices is allowed during class if the use is related to the course. Any use not related to the activities in GEOG 482 is prohibited.

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/>

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).

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

Mental health plays a pivotal role 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

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, suypaca@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> . The assembly point for both the lecture and computer lab 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.