UNIVERSITY OF CALGARY

GEOG 633 LEC01 Research and Applications in Remote Sensing
GFC Hours 3-3
Winter 2023 classes: January 9th – April 12th

Section	Days	Time	Location
LEC 01	W	9:00-11:45AM	ES 342
Lab 01	M	9:00-11:45AM	ES 415

Instructor: Dr. Greg McDermid	Office: ES 910
Telephone: 403-220-4780	Email: mcdermid@ucalgary.ca
Email communication will be through your UCalgary email address.	Office hours: Tuesdays and Thursdays 9:00 to 12:00 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
Review of basic and advanced principles of image analysis. Includes advanced laboratory techniques, integration of remote sensing with GIS, current research in remote sensing, project organization, and data sources for remote sensing.

Course Objectives
This course explores intermediate and advanced topics in remote sensing. Topics and techniques will be examined through instructor- and student-led lectures, lab assignments, and critical discussions. Laboratory assignments will focus on hands-on workflows related to LiDAR, cloud computing, remotely piloted aircraft systems, and other relevant topics. Students will develop term projects, which will be shared in a conference-style format at the end of the term.

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)**
Explain and perform appropriate geometric and radiometric transformations for given applications	3, 6	3
Use JavaScript for image acquisition and analysis	6	1
Use Google Earth Engine, LAS Tools, and other image-processing packages	5, 6	3
Perform and evaluate workflows for generating orthomosaics, digital surface models, digital terrain models, and canopy height models	6	3
Explain Transport Canada regulations surrounding remotely piloted aircraft systems	3	2
Explain and perform flight-planning procedures for remotely piloted aircraft	3, 6	2

systems		
Identify, prepare, and present a remote sensing topic-of-interest lecture to the class	**5, 7**	**2**
Explain the peer-review process and critically evaluate peer-reviewed journal articles from remote-sensing journals	**7, 8**	**3**
Report and communicate technical processes performed in the computer lab	**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

Learning Resources

There is no required textbook for this course. There are, however, several textbooks that make for good general reference material. It would be advantageous for students to own or gain access to one or more of the following texts:

- Jensen, J.E., 2016. Introductory Digital Image Processing: A Remote Sensing Perspective, 4th Edition. Pearson.
- Campbell, J.B., 2022. Introduction to Remote Sensing, 6th Edition. Guilford Press
- Lillesand, T. M, Keifer, R. W., and Chipman, J. W., 2015: Remote Sensing and Image Interpretation. 7th Edition. Wiley.

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

Assessment Methods

1. Laboratory Assignments	30%	Three assignments, tentatively due Feb 11, Mar 11, and Apr 1

2. Presentations

Remote Sensing Topic of Interest	10%	To be scheduled
Critical Review of Journal Article	10%	To be scheduled

3. Two Term Tests (12.5% each)	25%	Tentatively scheduled March 1 and April 12

4. Term Project

Project Proposal	5%	March 1
Project Report	15%	April 12

5. Class Participation	5%	N/A

There is no final examination for this course.

It is not essential to pass all components to pass the course as whole

Timed Assessments

There are two timed assessments in this course: Term Test #1 (tentatively scheduled for March 1) and Term Test #2 (tentatively scheduled for April 12). Both will be offered during lecture period in the same modality (In-person, synchronous) as the rest of the course.

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

The flexible grade option is not permitted in this course.

Additional Course Information

Students are expected to display competency with technical writing in this course through lab assignments and the term project.

A student who misses an assignment or in-person assessment will receive a grade of zero. If a student communicates with the instructor and explains the circumstances around the absence or missed assignment, the instructor may transfer the percentage weight for the assessment to another component of the course (such as the final examination), set another assessment, or make other alternative arrangements. An instructor will normally make this decision based on the information provided by the student. The instructor may ask for supporting documentation to confirm an absence. For additional information on supporting documentation, see University of Calgary calendar section M.1. Supporting Documentation and the Use of a Statutory Declaration.

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

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, January 19th, 2023**. The last day to add or swap a course for Winter 2023 is **Friday, January 20th, 2023**. The last day to withdraw from this course is **Wednesday, April 12th, 2023**. Please note that the University is closed on **Monday, February 20th** for Family Day. Term break is **February 19th – 25th**. The University is closed **Friday, April 7th** and **Monday, April 10th** for Easter.

> 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.
University of Calgary : K. Integrity and Conduct (ucalgary.ca)

UNIVERSITY OF CALGARY

Plagiarism, Cheating, and Student Misconduct
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 information on 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 regulates the return of term assessments. 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. 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.

Posting of Grades and Picking-up of Assignments
Graded assignments will be made available electronically through the course D2L webpage.

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

Within the first week of classes, students needing an accommodation because of a disability or medical condition should register with Student Accessibility Services Accessibility | Home | University of Calgary (ucalgary.ca) 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).

Use of internet and electronic devices in class
Respectful use of electronic devices for class-related purposes are permitted in the classroom. However, non-academic activities will not be tolerated.

Guidelines for Video Sessions
Video sessions maybe used in the event of instructor absence, for work within peer groups, or for other communication related to course obligations. To help ensure video sessions are private, do not share link or password with others via any medium, including social media platforms. Links and passwords are only intended for students registered in the course. Recordings and materials presented, 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 video conferencing sessions, 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 us 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 sessions visit: eLearn @ UCalgary

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If you are unable to attend a 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 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 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 class session. These recordings will be used to support student learning only and will not be shared or used for any other purpose.

Media Recording (if applicable)
Please refer to the following statement on media recording of students: https://elearn.ucalgary.ca/wp-content/uploads/2020/05/Media-Recording-in-Learning-Environments-OSP_FINAL.pdf

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.

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 disciplines under the Non-Academic Misconduct Act.

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, 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 The muster point is the ITC 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.