



GEOGRAPHY FINAL COURSE OUTLINE: WINTER 2018
GEOGRAPHY 433
H(3-3)

Remote Sensing II

| Section | Days | Times | Location |
|---------|------|---------------|----------|
| LECO1 | TuTh | 15:30 – 16.45 | ES 342 |
| LAB01 | We | 13:00 – 15:50 | ES 415 |

| | |
|-----------------------|---|
| Instructor: Geoff Hay | Office: ES 304 |
| UC –Tel: 220 4768 | Email: gjhay@ucalgary.ca |

Please note: The appropriate emergency evacuation assembly point for classes taught in Earth Sciences is ICT food court.

Official Course Description:

The course is divided into two sections; the first section will focus on introducing advanced remote sensing technologies including image segmentation and object based image classification methods, absolute and relative radiometric correction techniques, different spatial, spectral and temporal scales, LiDAR, point clouds and 3D modeling, and microwave remote sensing. The second section will focus on digital image processing techniques using Interactive Data Language (IDL). This section will include basic image operations, working with masks and image statistics, manipulating and customizing images, automate image processing and batch processing techniques in IDL.

Course Objectives:

In collaboration with the teacher, students will be supported to explore their own remote sensing based ideas/applications. They will be encouraged to participate in scenarios from which they can identify and develop a remote sensing research opportunity that can result in the generation of a commercial remote sensing based product, and/or service with real-world business applications. Students will be guided to develop and present their ideas as if they were presenting to their business manager/supervisor.

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 they facilitate and the expected level of achievement.

| Course Learning Outcomes | PLO(s) | Level(s) |
|---|-------------|----------|
| Perform 3 challenging remote sensing labs | 2 - 8 | 2,3 |
| Explore Theoretical Foundations of Remote Sensing | 1,2,4 | 1,2,3 |
| Explore Intermediate and Advanced Topics in RS | 1,2, 4 | 2,3 |
| Apply strategies for information extraction from RS imagery | 3,4,5,6 | 2,3 |
| Explain/critique strengths/limitations of pixel/object-based processing | 4 - 7 | 2,3 |
| Explore leading Remote Sensing Literature | 4,5,7,8 | 2,3 |
| Develop Project-Management & Business-Development Skills | 1,2,4,5,7,8 | 1,2 |
| Participate in Class Project Presentations, Evaluations and Assessments | 1,2,4,5,7,8 | 2,3 |

| | | |
|---|--------------------|------------|
| Practice public presentation skills | 1,2,4,5,7,8 | 2,3 |
| Lead a seminar presentation on your own topic of interest | 1,2,4,5,7,8 | 2,3 |
| Participate in Industry and Research – based guest lectures. | 1,5 | 2,3 |
| Write technical reports using standard formats and citation standards. | 7,8 | 2,3 |

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, (3) Advanced.

Prerequisite: Geography 333 and 339

Learning Resources:

No single textbook is required for this course. However, numerous related textbooks are available for overnight sign out from the Resource room, or on request from the instructor who will provide them to the Resource Room. The Internet will serve as an invaluable resource for information in this course; published peer-reviewed journal articles will form the bulk of the sources for topics. 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. R., 2015: Introductory Digital Image Processing: A Remote Sensing Perspective. Prentice Hall. 4th Edition. pp 623.
- Lillesand, T. M, Keifer, R. W., Chipman, J. W., 2015. *Remote Sensing and Image Interpretation*. 7th Edition. Wiley, pp 720.
- Northey, M. and D.B. Knight, 2012: *Making Sense, A Student’s Guide to Research and Writing in Geography and Environmental Sciences*, Fifth Edition. Oxford University Press.

Grading (Weighted)

| | | | |
|----|---|---|-----|
| 1. | Project Proposal (2-3 pgs) | = | 5% |
| 2. | 3 Lab Assignments (10% each) | = | 30% |
| 3. | Student TOI Presentation | = | 25% |
| 4. | Student TOI Paper (20 pgs +/- 5 pgs) | = | 30% |
| 5. | Participation in-class, Review Discussions, etc | = | 10% |

There are **no midterm or final examinations** for this course. It is not necessary to pass each course component in order to pass the course as a whole.

The only acceptable reasons for missing an examination or assignment in this class, as listed in the Deferral of Final Examinations section of the University of Calgary Calendar are illness, domestic affliction, or religious conviction. If you miss an assignment or examination, and you provide me with the appropriate documentation, you will have one opportunity to make arrangements for the missed work. Without appropriate documentation, you will receive a zero for that portion of your grade.

Grading System

| | | | | | | | | | |
|----|---------|----|---------|----|---------|----|---------|---|--------|
| A+ | 90-100 | B+ | 77-79.9 | C+ | 67-69.9 | D+ | 57-59.9 | F | 0-49.9 |
| A | 85-89.9 | B | 73-76.9 | C | 63-66.9 | D | 53-56.9 | | |
| A- | 80-84.9 | B- | 70-72.9 | C- | 60-62.9 | D- | 50-52.9 | | |

Human subjects

No research will be carried out on human subjects.

Supplementary Fees

No supplementary fees will be assessed.

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

SUPPLEMENTAL INFORMATION

Writing across the Curriculum

Writing skills are not exclusive to English courses and, in fact, should cross all disciplines. The university supports the belief that throughout their university careers students should be taught how to write well, so that when they graduate their writing abilities will be far above the minimal standards required at entrance. Consistent with this belief, students are expected to do a substantial amount of writing in their university courses and, where appropriate, faculty members can and should consider quality of writing as a factor in the evaluation of student work. The services provided by Writing Support Services can be utilized by all undergraduate and graduate students who feel they require further assistance: www.ucalgary.ca/ssc/writing_support/overview.

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: www.ucalgary.ca/access/accommodations/policy. 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 the Department Head (email: geograph@ucalgary.ca).

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: www.ucalgary.ca/pubs/calendar/current/k-5.html.

Internet and electronic communication device information:

There is no restriction on the use of laptops and tablets in class if they are used to take notes or find information relevant to the class, and if there is no disturbance or distraction of other students or the instructor. Phones must be turned off during class, unless you have previously identified yourself to the instructor as a health care or law enforcement professional..

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 schedule 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.

Faculty of Arts Program Advising and Student Information Resources

Have a question, but not sure where to start? The Faculty of Arts Students Centre is your information resource for everything in Arts! Drop in at SS 102, call us at 403-220-3580, or email us at ascarts@ucalgary.ca. You can also visit the Faculty of Arts website at <http://arts.ucalgary.ca/undergraduate>, which provides detailed information about common academic concerns.

For guidance on course registration (add, drop, swap), information about paying fees, and assistance with your Student Centre, contact Enrolment Services at 403-210-7625 or visit them at the MacKimmie Block.

Contact Information for Student and Faculty Representation

- SU VP Academic Phone: 220-3911 and e-mail: suvpaca@ucalgary.ca
- SU Faculty Rep. Phone: 220-3913 and e-mail: arts1@ucalgary.ca
- The students ombudsman office information can be found at: www.ucalgary.ca/ombuds/

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/>).

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.

USRI Surveys

At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference, so please participate in USRI surveys.