



COURSE OUTLINE

Advanced Topics in Remote Sensing

Lecture: Elliot Building ELL 161 2:30pm-4:20pm Tuesdays

Lab: David Turpin Building A253 1:00pm-3:50pm Thursdays

Office Hours: Tuesdays 12:00-14:00 or by appointment

Office Location: DTB B122

Contact: randy@uvic.ca

COURSE DESCRIPTION

This course is designed to provide you with the opportunity to integrate your strong background in geography or other earth/biological sciences with remote sensing. The course is intended to be a capstone focusing on your work and integration of your previous knowledge. The focus of the course will be to work through a problem that can, at least in part, be addressed by remote sensing technology. Part of the exercise therefore will be to define a research question. This will be followed by an exploration of the methods that can be used to address this question. You will then be asked to isolate the remote sensing component of the solution to the question that you have asked. We will help you source the data, where possible, to allow you to complete this portion of the project. Through lectures, exercises, and seminar-based discussions, you will also gain exposure to advanced remote sensing principles and techniques (e.g. UAV remote sensing) to help broaden your knowledge of remote sensing and guide your use of data in your project work.

The course has three main components:

- 1) Group Project. The expectation is that you form a group of 3-4 participants and execute a research project of your choosing. You will be given the opportunity to develop a project that suits your collective interests, and takes advantage of your respective strengths, within the limits of available data. The progress of the projects will be monitored through a series of deliverables (see below). The data that you will have access to are, for the most part, new (that is you will be the first to work on them) and are collected from airborne multi sensor campaigns. Typically, we will have RADAR, LiDAR, hyperspectral data and orthophotography. There are ground-based, airborne, and satellite based remote sensing datasets.
- 2) Lecture/Demonstration. We will have a number of presentations and demonstrations to broaden your outlook on the application of remote sensing data to addressing a variety of issues. There may be opportunity to hold an off-site UAV flying demonstration (details forthcoming).
- 3) Seminars. These will be based on assigned readings and topics, and much of the interaction will be student lead.

Lab time will be dedicated to group project work, and to the execution of two lab exercises done individually (not as groups).

REQUIRED TEXT(S)

None. For project and seminar-based work you will be expected to make additional use of remote sensing texts, journal articles, other material in the university libraries, & web-based information to support your work. Readings will also be provided by your instructor.

Recommended journals include: *Canadian Journal of Remote Sensing*, *Remote Sensing of the Environment*, *Journal of Geophysical Research*, *IEEE Transactions on Geoscience and Remote Sensing*.

EVALUATION

Project Definition (Oral & Written) – One per group	5%
Quiz #1	10%
Lab #1	10%
Literature Review	10%
Lab #2	10%
Progress Update (Oral & Written) – One per group	5%
Quiz #2	10%
Presentation of Final Project (Oral) – One per group	10%
Final Report (Oral & Written) – One per group	30%

There is no final exam in this course.

GRADING SYSTEM

As per the Academic Calendar:

Grade	Grade point value	Grade scale	Description
A+ A A-	9 8 7	90-100% 85-89% 80-84%	Exceptional, outstanding and excellent performance. Normally achieved by a minority of students. These grades indicate a student who is self-initiating, exceeds expectation and has an insightful grasp of the subject matter.
B+ B B-	6 5 4	77-79% 73-76% 70-72%	Very good, good and solid performance. Normally achieved by the largest number of students. These grades indicate a good grasp of the subject matter or excellent grasp in one area balanced with satisfactory grasp in the other area.
C+ C	3 2	65-69% 60-64%	Satisfactory, or minimally satisfactory. These grades indicate a satisfactory performance and knowledge of the subject matter.
D	1	50-59%	Marginal Performance. A student receiving this grade demonstrated a superficial grasp of the subject matter.
F	0	0-49%	Unsatisfactory performance. Wrote final examination and completed course requirements; no supplemental.
N	0	0-49%	Did not write examination or complete course requirements by the end of term or session; no supplemental.

GEOGRAPHY DEPARTMENT INFO

- Geography Department website: uvic.ca/socialsciences/geography
- Undergraduate Advising: geogadvising@uvic.ca

COURSESPACES

Lectures materials, assigned readings, and general course communications will be via CourseSpaces. You are required to come prepared for each lecture. This means you should have read and considered the assigned readings.

POLICY ON LATE ASSIGNMENTS

Late lab assignments are subject to significant penalties: 20% per day following the due date and time. Exceptions are not permitted except for circumstances involving medical or compassionate reasons. Written verification as proof may be requested at the discretion of the instructor.

ACADEMIC INTEGRITY

It is every student's responsibility to be aware of the university's policies on academic integrity, including policies on **cheating, plagiarism, unauthorized use of an editor, multiple submission, and aiding others to cheat. Policy on Academic Integrity:**

<http://web.uvic.ca/calendar/undergrad/info/regulations/academic-integrity.html>

If you have any questions or doubts, talk to me, your course instructor. For more information, see <http://www.uvic.ca/learningandteaching/students/resources/expectations/>. The instructor reserves the right to use plagiarism detection software programs to detect plagiarism in written assignments.

ACCESSIBILITY

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a documented disability or health consideration that may require accommodations, please feel free to approach me and/or the Centre for Accessible Learning (CAL as soon as possible <https://www.uvic.ca/services/cal/>). The CAL staff is available by appointment to assess specific needs, provide referrals, and arrange appropriate accommodations. The sooner you let us know your needs, the quicker we can assist you in achieving your learning goals in this course.

POSITIVITY AND SAFETY

The University of Victoria is committed to promoting, providing and protecting a positive and safe learning and working environment for all its members.

COURSE EXPERIENCE SURVEY (CES)

I value your feedback on this course. Towards the end of term, as in all other courses at UVic, you will have the opportunity to complete an anonymous survey regarding your learning experience (CES). The survey is vital to providing feedback to me regarding the course and my teaching, as well as to help the department improve the overall program for students in the future. The survey is accessed via MyPage and can be done on your laptop, tablet, or mobile device. I will remind you and provide you with more information nearer the time but please be thinking about this important activity during the course.

WEEKLY CALENDAR

WEEK	DATE	
1	T 7 Jan	Course Introduction
2	T 14 Jan	<i>Topic: Scale and Machine Learning (I); Project Scoping</i>
3	T 21 Jan	<i>Topic: Scale and Machine Learning (II); Seminar Discussion</i>
4	T 28 Jan	Quiz #1; Project Definition Presentations
5	T 4 Feb	<i>Topic: Cloud-based Geospatial Processing – Earth Engine (I)</i>
6	T 11 Feb	<i>Topic: Cloud-based Geospatial Processing – Earth Engine (II); Seminar Discussion</i>
7	T 18 Feb	READING BREAK, NO CLASS
8	T 25 Feb	Quiz #2; Guest Lecture (TBD)
9	T 3 Mar	Group Project Updates, Discussion, and Troubleshooting
10	T 10 Mar	<i>Topic: Unmanned Aerial Systems (I) – Systems and Applications</i>
11	T 17 Mar	<i>Topic: Unmanned Aerial Systems (II) – Piloting, Safety, and Regulations</i>
12	T 24 Mar	Group Project Work
13	T 31 Mar	Class presentations: projects

DISCLAIMER

The above schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances.