



COURSE OUTLINE

Remote Sensing of the Environment – Passive Sensors

Lecture: COR B129

Thursday 16:30 - 18:20

Labs: DTB A253

Friday 08:30 - 10:20

Friday 11:30 - 13:20

Office Hours: Thursday 09:00 - 15:30

Office Location: DTB B212

Contact: ediloos@uvic.ca

COURSE DESCRIPTION

This course introduces the basic physical principles of modern remote sensing. Emphasis is placed on the principles of interaction of energy with the atmosphere and Earth materials such as vegetation, water, soil, rock/minerals, and how to obtain and interpret imagery acquired by different satellites. We focus on the optical and thermal part of the spectrum. This course builds on the fundamentals of remote sensing and imagery processing introduced in GEOG 228.

LEARNING OUTCOMES:

- To obtain an understanding on how remote sensing can be used to extract information about the Earth's surface
 - To be able to explain how optical radiation interacts with the Earth's surface
 - To be able to find and download imagery acquired by different satellites
 - To learn modern remote sensing technology
 - To be able to explain how satellite imagery can be used for time-series analysis
 - To be able to explain how satellite imagery can be used to derive biogeophysical variables
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RECOMMENDED TEXT(S)

Jensen, J.R. (2007) *Remote Sensing of the Environment: An Earth Resources Perspective*, 2nd Ed. Pearson Prentice-Hall. 656 p.

The textbook can be purchased at the UVic Bookstore. Copies are available at the UVic Library.

EVALUATION

| Component A | | Component B | |
|--------------------|------------|--------------------|------------|
| Mid-term Exam | 25% | Lab Assignments | 40% |
| Final Exam | 35% | | |

To obtain a passing grade in the course (at least a “D”), students are required to pass both components of the course.

Mid-term Exam: The Mid-term Exam will cover all material up until and including February 06th (see course schedule below).

Final Exam: The Final Exam will cover all the material of the course and will be held according to the UVic calendar.

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 Exam and completed course requirements; no supplemental. |
| N | 0 | 0-49% | Did not write Final Exam or complete course requirements by the end of term or session; no supplemental. |

BRIGHTSPACE

Lecture slides, announcements, and lab assignments can be accessed through Brightspace at bright.uvic.ca.

LABS

There are four lab assignments. The labs are an essential part of the course and you are expected to have basic computer skills such as file maintenance, word processing, and conducting spreadsheet operations (e.g. Microsoft Excel). Attendance is required. All labs will be held in the Geomatics Lab A251/253. Each lab will explore unique aspects of remote sensing. Analysis and presentation of data, as well as preparation of synthesis reports, are valuable skills that will be developed as part of lab assignments. Time outside of regularly scheduled labs will be required to complete assignments, so plan accordingly.

Lab Website:

<http://labs.geog.uvic.ca/geog319/>

user: geog319

password: hyperspectral

LAB ACCESS

You will require a high-speed USB drive (32 GB or higher) for the lab portion of this course. There will be a limited number for purchase from the Department of Geography if you do not have your own. Your lab instructor will have details during the first lab session.

The Geomatics Teaching Laboratory (DTB A251/A253) is open daily from 08:30 to 16:30. Access to the Laboratory is restricted after 16:30 for security purposes. You are encouraged to purchase a key card, which will enable you to gain access to that facility after hours. The cost of the card is \$10.00 and you can keep it in case you take another course that uses the lab facilities. Contact Terri Evans at tevans@uvic.ca.

GEOGRAPHY DEPARTMENT INFO

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

TENTATIVE COURSE SCHEDULE

| WEEK | DATE | Lecture | Lab |
|------|--------|---|---|
| 1 | Jan 09 | Introduction, Review | No lab |
| 2 | Jan 16 | Electromagnetic Radiation | Lab 1 - Image Acquisition |
| 3 | Jan 23 | Radiometry, Radiometric Corrections | Lab 1 (continued) |
| 4 | Jan 30 | Atmospheric Corrections | Lab 1 (continued) |
| 5 | Feb 06 | Remote Sensing of Vegetation | Lab 2 - Vegetation Analysis (Lab 1 due) |
| 6 | Feb 13 | Mid-term Exam | Lab 2 (continued) |
| 7 | Feb 20 | Reading Break | No lab |
| 8 | Feb 27 | Remote Sensing of Vegetation | Lab 3 - Water Analysis (Lab 2 due) |
| 9 | Mar 06 | Remote Sensing of Water | Lab 3 (continued) |
| 10 | Mar 13 | Remote Sensing of Water | Lab 3 (continued) |
| 11 | Mar 20 | Thermal Remote Sensing | Lab 4 - Thermal Analysis (Lab 3 due) |
| 12 | Mar 27 | Remote Sensing of Soils, Minerals, Urban Landscapes | Lab 4 (continued) |
| 13 | Apr 03 | Course Review | Lab 4 (continued) |

Additional UVic important dates can be found here: uvic.ca/calendar/dates.

DISCLAIMER

The above schedule, policies, procedures, and assignments in this course are subject to change without prior notice.

POLICY ON LATE ASSIGNMENTS AND DEFERRALS (ACADEMIC CONCESSION)

Lab assignments are due at the beginning of the following week's lab. The penalty for assignments handed in late is 20% per day every day after. All lab assignments must be submitted to be allowed to sit the Final Exam. Failure to submit a lab assignment will result in a failing grade of incomplete (N). Exceptions will only be granted for medical reasons. In order to request an extension related to labs or exams, you must fill out the *Undergraduate Request for In-Course Extension* document and email to your lab instructor with supporting documentation before your lab is due. More information, as well as the request form, can be found here: <https://www.uvic.ca/students/academics/academic-concessions-accommodations/request-for-academic-concession/index.php>

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: 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 uvic.ca/learningandteaching/cac/index.php.

Students are expected to complete assignments independently unless otherwise instructed.

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 (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 environments for all its members.

SEXUALIZED VIOLENCE PREVENTION AND RESPONSE AT UVIC

UVic takes sexualized violence seriously and has raised the bar for what is considered acceptable behaviour. We encourage students to learn more about how the university defines sexualized violence and its overall approach by visiting uvic.ca/svp. If you or someone you know has been impacted by sexualized violence and needs information, advice, and/or support please contact the sexualized violence resource office in *Equity and Human Rights* (EQHR). Whether or not you have been directly impacted, if

you want to take part in the important prevention work taking place on campus, you can also reach out:

Where: Sexualized violence resource office in EQHR; Sedgewick C119

Phone: 250.721.8021

Email: svpcoordinator@uvic.ca

Web: uvic.ca/svp

RESOURCES FOR INTERNATIONAL STUDENTS

The University of Victoria offers a number of resources to support international students as they pursue their studies. UVic's [International Centre for Students](#) is the primary office supporting international students on campus at the university-wide level and provides various supportive program through the [UVic Global Community Initiative](#), including a Mentorship Program and Conversation Partner Program. For academic advising-related questions, students in the Geography Department are also encouraged to meet with the Geography Undergraduate Advisor (geogadvising@uvic.ca) as well as an academic advisor in the [Academic Advising Centre](#) early in their studies to help map out a plan to declare a major and complete university program requirements. Other resources include the [Centre for Academic Communication](#) and the [Math and Stats Assistance Centre](#). International students are also encouraged to contact the International Student Liaison in Geography (Prof. CindyAnn Rose-Redwood, cindyann@uvic.ca), who can assist in making connections with other international and domestic students in the Geography Department and share opportunities for getting involved in departmental activities more broadly.

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. 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 online and can be done on your laptop, tablet, or mobile device. I will remind you and provide you with more detailed information nearer the time but please be thinking about this important activity during the course.

NOTE:

Take care of yourself. Do your best to maintain a healthy lifestyle this semester by eating well, exercising, getting enough sleep, and taking some time to relax. This will help you achieve your goals and cope with stress. All of us benefit from support during times of struggle. You are not alone.

Counselling Services - *Counselling Services can help you make the most of your university experience. They offer free professional, confidential, inclusive support to currently registered UVic students.* uvic.ca/services/counselling/

Health Services - *University Health Services (UHS) provides a full-service primary health clinic for students and coordinates healthy student and campus initiatives.* uvic.ca/services/health/

Centre for Accessible Learning - *The CAL staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations* uvic.ca/services/cal/. *The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.*

Elders' Voices - *The Office of Indigenous Academic and Community Engagement (IACE) has the privilege of assembling a group of Elders from local communities to guide students, staff, faculty, and administration in Indigenous ways of knowing and being.*

uvic.ca/services/indigenous/students/programming/elders/index.php