

**Geog 319 –Remote Sensing of the Environment – Passive  
Sensors****September 2021****Territory acknowledgement**

We acknowledge with respect the Lekwungen peoples on whose traditional territory the University of Victoria stands, and the Songhees, Esquimalt and W̱SÁNEĆ peoples whose historical relationships with the land continue to this day.

**Course Objectives**

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, soil, water, rock/minerals, and how to obtain and interpret imagery acquired by different satellites. We focus on the optical and thermal part of the spectra. This course builds on the fundamentals of remote sensing and imagery processing introduced in GEOG228.

## LEARNING OUTCOMES

1. To obtain an understanding on how remote sensing can be used to extract information about the Earth's surface
2. To be able to explain how optical radiation interacts with the Earth's surface
3. To be able to find and download imagery acquired by different satellites
4. To learn modern remote sensing technology
5. To be able to explain how satellite imagery can be used for time-series analysis
6. To be able to explain how satellite imagery can be used to derive biogeophysical variables

**Instructor**

Maycira Costa (maycira@uvic.ca)

**Office Hours**

Wednesdays from 2:30 pm-3:30 pm

We can set-up personal appointments if this schedule does not work for you. Please, send me an email: [maycira@uvic.ca](mailto:maycira@uvic.ca)

**Lectures** Tuesday from 10:30am – 11:20am  
 Wednesday from 10:30am – 11:20am

CLE A208

HOW TO ACCESS THE MATERIAL FOR THIS COURSE?  
 In **Brightspace** (use your **Netlink ID**), select **Geog 319, Lecture Content**, the **week**, and click on the **link**.

**Lab coordinator** Terri Evans DTB A241 ([tevens@uvic.ca](mailto:tevens@uvic.ca))

**Lab Hours** Friday 8:30am – 10:20am  
 Friday 11:30am – 1:20pm

**Office Hours** Wednesday 10:00 – 11:00, and 1:00 – 2:00  
 (or by appointment)

**Late Assignment Policy** 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 examination. Failure to submit a lab assignment will result in a failing grade of incomplete (N).** Exceptions will only be granted for medical reasons (requiring a written report from a medical practitioner stating your inability to hand the lab assignment) or extreme personal crises. Only the course instructor can grant exceptions.

### Course Evaluations

|               | Component A |                 | Component B |
|---------------|-------------|-----------------|-------------|
| Mid-term Exam | <b>25%</b>  | Lab assignments | <b>40%</b>  |
| Final Exam    | <b>35%</b>  |                 |             |

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

**Midterm examination:** The midterm examination will cover all material up until and including October 19th (see course schedule below).

**Final examination:** The final examination will cover all the material of the course. The final examination will be held according to the UVic calendar.

## GRADING SYSTEM

As per the Academic Calendar:

| Grade | Grade point value | Grade scale | Description  |
|-------|-------------------|-------------|--|
| A+    | 9                 | 90-100%     | <b>Exceptional, outstanding and excellent</b> 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.         |
| A     | 8                 | 85-89%      |  |
| A-    | 7                 | 80-84%      |  |
| B+    | 6                 | 77-79%      | <b>Very good, good and solid</b> 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. |
| B     | 5                 | 73-76%      |  |
| B-    | 4                 | 70-72%      |  |
| C+    | 3                 | 65-69%      | <b>Satisfactory, or minimally satisfactory.</b> These grades indicate a satisfactory performance and knowledge of the subject matter.  |
| C     | 2                 | 60-64%      |  |
| D     | 1                 | 50-59%      | <b>Marginal</b> Performance. A student receiving this grade demonstrated a superficial grasp of the subject matter.  |
| F     | 0                 | 0-49%       | <b>Unsatisfactory</b> 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.  |

### Course Text

Jensen, J.R. (2013). Remote Sensing of the Environment: An Earth Resources Perspective.

### Lab Website:

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

Username: geog319

Password: hyperspectral

### Lab Computers

Username: your UVic Netlink-ID

Password: your Netlink-ID password

### Lecture Summaries

Lecture presentations can be downloaded from the Geog 319 Brightspace page

Username: your UVic Netlink-ID

Password: your UVic Netlink-ID password

These files are intended as a supplement to the lectures. They are not

---

intended to replace the lectures, although most of the material covered in the lectures is contained in the notes. I plan to post the pdf before the class starts.

**Lab Access**

The Geomatics Teaching Laboratory (Social Sciences & Math A251/A253) is open daily from 8.30 am to 4.30 pm. Access to the Laboratory is restricted after 4.30 pm for security purposes. You are encouraged to purchase a key fob, which will enable you to gain access to that facility after hours. The cost of a card is \$10.00 and you can keep it in case you take another course that uses the lab facilities.

You are strongly encouraged to have a 32GB high speed USB3 drive for the lab portion of this course. There will be some available for purchase for \$20.00.

**Academic Standards**

Plagiarism will be dealt with in accordance with university policy. Please review the calendar for details. Be sure to reference all material you use. If you have any questions, please contact me.

**Students with a Disability**

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a documented disability/health consideration that may require accommodations, please feel free to approach me and/or the Centre for Accessible Learning (CAL) as soon as possible. The CAL staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations <https://www.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.

Please Note: You are under no obligation to disclose your disability.

**Notes**

1. I reserve the right to make changes to the schedule.
2. The best way to reach me is to attend the office hours.
3. If you have ANY concerns related to lectures, labs, and/or exams, please come see me as soon as possible.

**Syllabus Copyright Statement:**

All course content and materials are made available by instructors for educational purposes and for the exclusive use of students registered in their class. The material is protected under copyright law, even if not marked with a ©. Any further use or distribution of materials to others requires the written permission of the instructor, except under fair dealing or another exception in the Copyright Act. Violations may result in disciplinary action under the Resolution of Non-Academic Misconduct Allegations policy (AC1300).

## Tentative Course Schedule

| WEEK | DATE          | Topic  |
|------|---------------|--|
| 1    | Sept 8        | Goals and structure of the course. Remote sensing of the environment; Electromagnetic radiation - principles |
| 2    | Sept 14, 15   | Image properties; Sensors/satellites review  |
| 3    | Sept 21, 22   | Atmospheric attenuation/Atmospheric correction   |
| 4    | Oct 28, 29    | Vegetation   |
| 5    | Oct 5, 6      | Vegetation   |
| 6    | Oct 12, 13    | Water  |
| 7    | Oct 19, 20    | <u>MIDTERM (19<sup>th</sup>)</u><br>Talk – kelp detection: UAV and satellite                                 |
| 8    | Oct 26, 27    | Water  |
| 9    | Nov 2, 3      | Thermal  |
| 10   | Nov 9, 10     | <i>Reading break – no classes</i>  |
| 11   | Nov 16, 17    | Thermal  |
| 12   | Nov 23, 24    | Soils, Minerals  |
| 13   | Nov 30, Dec 1 | Talk/Review  |

THE UNIVERSITY OF VICTORIA IS COMMITTED TO PROMOTING, PROVIDING AND PROTECTING A POSITIVE AND SAFE LEARNING AND WORKING ENVIRONMENT FOR ALL OF ITS MEMBERS.