

GEOG 480/580

Remote Sensing and Image Analysis

Course Delivery Method: hybrid (<https://www.pdx.edu/course-delivery-methods>)

Prerequisite: GEOG 488/588, or instructor approval

Course Objectives

GEOG 480/580 is an introduction to remote sensing and image analysis, covering concepts, methodologies, and techniques. Topics will include how remote sensing data are acquired and stored, visual image interpretation, photogrammetry, processing and transformation of image data to prepare it for interpretation or analysis, and a very brief introduction to methods of analysis. We will talk about active and passive sensor systems and the types of data they produce, as well as multispectral data and concepts.

Text and Readings

There is no required text for this course, but a number of readings will be provided.

Lectures

This course uses a “flipped classroom” model. Lectures will be delivered asynchronously in the form of pre-recorded videos and PDF copies of the lecture slides. You will view/read the lecture material on your own schedule prior to the scheduled synchronous class meetings, at which meetings we will address questions and discuss the lecture material.

Lecture Worksheets

There will be weekly worksheets that include questions and/or exercises related to each week’s lecture topics. You will submit your completed worksheets for credit.

Synchronous Class Meetings

Each week, there will be one in-person class meeting. At this class meetings, we will cover any questions you may have had while viewing the lecture material, we will discuss the lecture material, we will go over the answers to some of the lecture worksheet questions, and we will work through exercises intended to help solidify your understanding of the lecture material.

Computer Lab Exercises

There will be six lab assignments that reinforce concepts covered in lecture. You will be required to use ArcGIS Pro software for the lab assignments.

Lab section meetings will take place in-person at the scheduled day and time, and the instructor will be present to help you complete the lab exercises. It is to your benefit to attend these in-person lab sessions, but it is possible to complete the lab assignments at home using a personal computer.

Exams

There will be two midterms. Both will be open-book, take-home exams. There will be no final exam.

Project

Each student will complete a term project based on topics covered and skills learned in this course. The end product of the project will be a PDF poster. The topic of the poster may be informational, illustrating some aspect of remote sensing, or it may involve using remote sensing data and techniques to answer a geographical question. Term project requirements will be described in detail during our second class meeting.

Graduate Student Presentations

Graduate students will deliver a 10-minute presentation to the class on a topic related to remote sensing. Student presentations will occur each week starting with our third class meeting. Graduate student presentation requirements will be described in detail during our first class meeting.

Grading

480:

Lab Assignments 40%
Lecture Worksheets 15%
Exams 25% (12.5% each)
Project 20%

580:

Class Presentation 5%
Lab Assignments 30%
Lecture Worksheets 15%
Exams 25% (12.5% each)
Project 25%

Grading break points will be near 90% (A), 80% (B), and 70% (C). However, exact break points will depend on overall class results.

Academic Integrity

You are responsible for the content and integrity of the academic work you submit. The guiding principle of academic integrity shall be that your submitted work, examinations, and projects must be your own work. Note that cutting and pasting sources from the internet is considered plagiarism. Copying answers from a friend or fellow classmate is plagiarism. If you need help determining what is or is not plagiarism, please talk to the instructor. Plagiarism is a form of academic misconduct, and may result in academic sanctions as described in the PSU Code of Student Conduct (<https://www.pdx.edu/dos/psu-student-code-conduct>).

Access and Inclusion for Students with Disabilities

PSU values diversity and inclusion; we are committed to fostering mutual respect and full participation for all students. My goal is to create a learning environment that is equitable, useable, inclusive, and welcoming. If any aspects of instruction or course design result in barriers

to your inclusion or learning, please notify me. The Disability Resource Center (DRC) provides reasonable accommodations for students who encounter barriers in the learning environment.

If you have, or think you may have, a disability that may affect your work in this class and feel you need accommodations, contact the Disability Resource Center to schedule an appointment and initiate a conversation about reasonable accommodations. To contact the DRC, call 503-725-4150, email drc@pdx.edu, or visit the DRC virtual front desk between 12 PM and 4 PM Monday through Friday at <https://pdx.zoom.us/j/379914326>.

- If you already have accommodations, please contact me to make sure that I have received a faculty notification letter and to discuss your accommodations.
- Students who need accommodations for tests and quizzes are expected to schedule their tests to overlap with the time the class is taking the test.

Title IX Reporting Obligations related to Discrimination and Harassment

As an instructor, students at times come to me for assistance in matters that are not related to the course material. Please be aware that PSU's policies require faculty members to report any instance of sexual harassment, sexual violence and/or other forms of prohibited discrimination. If you would rather share information about these experiences with an employee who does not have these reporting responsibilities and can keep the information confidential, please contact one of the following campus resources (or visit <https://www.pdx.edu/sexual-assault/get-help>):

- Confidential Advocates (503-725-5672) or psuwrc.youcanbook.me (for matters regarding sexual harassment and interpersonal/sexual violence)
- Center for Student Health and Counseling (SHAC): 1880 SW 6th Ave, 503) 725-2800
- Student Legal Services: 1825 SW Broadway, (SMSU) M343, (503) 725-4556

For more information about Title IX, please complete the required student module, Creating a Safe Campus, in your D2L.

Flexibility Statement

The instructor reserves the right to modify course content and/or substitute assignments and learning activities in response to institutional, weather, or class situations.

Course Schedule

Week	Lecture/Worksheet Topics	Notes
1	Introduction to remote sensing	
2	EM spectrum and interactions with matter Term project info	
3	Image capture	
4	Image display & enhancement Photogrammetry	
5	Image interpretation & analysis	midterm 1 distributed
6	Passive sensor systems	
7	Thermal infrared sensor systems Active sensor systems	
8	Image processing	
9	Introduction to analysis of remote sensing data	midterm 2 distributed
10	no new content, work on finishing term projects and other assignments	
11	<i>poster session</i>	

Notes:

Lab Schedule

Week	Lab Topic	Due Date
1		
2	Lab 1: ArcGIS Review & Raster Datasets	
3		
4	Lab 2: Image Display and Enhancement	
5	Lab 3: Image Interpretation	
6	Lab 4: Working with Satellite Data	
7		
8	Lab 5: SAR and LIDAR	
9	Lab 6: Digital Image Analysis	
10		
11		