

GEOG 485/585

Remote Sensing I

LECTURE

9:00 - 9:50 Monday & Wednesday, 16 PAC
Instructor: Mark Fonstad
Office: 107F Condon Hall
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Phone: (541) 346-4208
Office Hours: Wednesday, 8:00a – 9:00a or by apt.

LAB

10:00 - 11:50 Monday OR Wednesday
SSIL - McKenzie 442
Instructor: Christina Shintani
Office: 217A Pacific Hall
Email: cshintan@uoregon.edu
Phone: (571) 230-0686
Office Hours: Thursdays 2:00p – 3:00p

COURSE DESCRIPTION

Introduction to remote sensing science including its physical basis, instruments, platforms, data, processing methods, and applications

The course will cover:

- the electromagnetic spectrum, interactions between light and matter (including atmospheric effects) and the resultant electromagnetic signals;
- the basic concepts behind the devices used to record (and sometimes project) electromagnetic signals, and their respective advantages and disadvantages;
- components of a digital image processing, including:
- sources of image distortion and techniques used for image restoration;
- techniques for enhancing images to better visualize spectral signals and patterns;
- the use of digital electromagnetic data for classification, mapping, and monitoring environmental processes and environmental change.

Lectures cover the topics above and related issues. Lab sessions focus on understanding how digital data can be translated into effective visualizations of the environment (image enhancement), on techniques for correcting problems with the imagery (image restoration), and on approaches for land cover mapping with remotely sensed imagery (image classification). Learning to navigate through the image processing software (Erdas Imagine) will be an important part of each lab.

Prerequisites: GEOG 181 or consent of instructor.

REQUIRED READINGS AND MATERIALS

Text - Introduction to Remote Sensing, 5th Edition. Campbell and Wynne, 2011. Guilford.

In addition to the class required text, on-line materials and research articles may be assigned. Labs and additional readings are provided on the course website at blackboard.uoregon.edu

GRADING

The final grade scale is as follows: A+: >98; A: 92-98; A-: 90-92; B+: 88-90; B: 82-88; B-: 80-82; C+: 78-80; C: 72-78; C-: 70-72%; D+: 68-70; D: 62-68; D-: 60-62; F: <60. For the pass/no pass option: a pass will be awarded for a C or above for undergraduate work, B (>80) or above for graduate work. Incompletes (I) will only be given in special situations.

Undergraduate Students (Geog 485)

Tests are 50% of the grade, with one in-class midterm and an in-class final. Labs make up the remaining 50% of the grade.

Graduate Students (Geog 585)

Tests are 50% of the grade, with one in-class midterm and an in-class final. Labs make up 30% of the grade for graduates. Graduate students will produce a small final project accompanied by a project write-up and short presentation that makes up 20% of their grade. This project will be comprised of a research question, digital image acquisition and processing to answer the research question, and a significant write-up of what was done, why it was done, and how well it worked.

LABS AND LAB GRADES

Labs provide practical experience that is typical of what you will encounter on most any remote sensing project. All labs will be done using ERDAS Imagine, one of the most widely used remote sensing software. Early labs will familiarize you with the basic structure of the software. Later labs will introduce you to subjects such as image enhancement (visualization) techniques, techniques for adding geographical coordinates to images, data transformation approaches to extract specific types of information, and classification approaches for mapping land cover.

Laboratory sessions will be in SSIL. I really want you to work with one another on these assignments in order to exchange knowledge with your partners. However, you should complete your own work and turn in your own work for grading. You are encouraged to collaborate on labs with other teams and help one another out, but do not copy each other's written answers. I expect all answers to be written in complete sentences with all words correctly spelled.

The dates below are the date each lab begins. Labs must be turned in digitally on Blackboard one week after they are assigned -- otherwise you will receive a ZERO on the assignment unless you have made arrangements with me beforehand. It is essential that you complete the labs because many of them are sequential and build on knowledge you have gained from the previous lab.

Always bring a USB flash drive to lab to back up your work at the end of class. The shared drives at SSIL will be available to you, but it is always good to have a backup nonetheless.

ACADEMIC DISHONESTY

I will not tolerate cheating or academic misconduct/dishonesty in my courses; examples of these behaviors include (but are not limited to):

- Plagiarism (passing off the work of another as that of your own)
- Copying answers from your neighbors during exams/activities
- Dishonesty concerning reasons for absence from class
- Any other actions that might give you an unfair advantage over your classmates.

All cases of academic dishonesty/misconduct will be referred immediately to the Student Judicial Affairs Office. The penalties for engaging in academic dishonesty and/or misconduct can range from a grade of "F" for an assignment to an automatic failure of the course. Please consult the university policy on the UO Dean of Students website <http://uodos.uoregon.edu>

LATE/MAKE-UP WORK

Late labs will not be accepted and make-up work will not be assigned, except in extreme circumstances and where you have documentation. If you must miss a lab section or exam due to illness or other unavoidable circumstances, you MUST notify the instructor and lab GTF prior to missing if at all possible.

ACCESSIBLE EDUCATION NOTICE

I work hard to ensure a quality learning experience for all students. If you need specific accommodations to get the most out of this class, please let me know by (1) informing me of your particular needs, and (2) providing the appropriate documentation from the Accessible Education Center. I will make every effort to accommodate your needs, but you must notify me by the first week of class if you need special arrangements.

NOTE: I consider this syllabus a contract between myself and the students in this course. In writing this syllabus, I have obligated myself to follow the policies and procedures contained herein. You are responsible for understanding and following these policies as well. I reserve the right to make changes to this syllabus. You will receive verbal and written notification of major changes to course policies, procedures and content.

TENTATIVE SCHEDULE

Date	Topic	Reading	Lab
Jan 5	Introduction, History of RS	Ch. 1	SSIL, Erdas Intro
Jan 7	Electromagnetic Radiation	Ch. 2	SSIL, Erdas Intro
Jan 12	Electromagnetic Radiation	Ch. 2	Image Type Comparisons
Jan 14	Mapping Cameras, Aerial	Ch. 3	Image Type Comparisons
Jan 19	NO CLASS – MLK DAY	---	NO LAB
Jan 21	Digital Imagery, Resolution	Ch. 4, 10	NO LAB
Jan 26	Satellite RS Platforms	Ch. 6	Subsetting, Mosaicing, Filters, Indices
Jan 28	Image Interpretation	Ch. 5	Subsetting, Mosaicing, Filters, Indices
Feb 2	Image Classification	Ch. 12	Image Interpretation & Enhancement
Feb 4	Image Classification	Ch. 12	Image Interpretation & Enhancement
Feb 9	MIDTERM EXAM	----	Classification 1: Unsupervised
Feb 11	Guest Lecture TBD	----	Classification 1: Unsupervised
Feb 16	Plant Sciences	Ch. 17	Classification 2: Supervised
Feb 18	Land Use / Land Cover	Ch. 20	Classification 2: Supervised
Feb 23	Land Use / Land Cover	Ch. 20	Change Detection
Feb 25	Change Detection	Ch. 16	Change Detection
Mar 2	Change Detection, Field Data	Ch. 16, 13	Change Detection
Mar 4	Guest Lecture TBD	---	Change Detection
Mar 9	Accuracy Assessment	Ch. 14	Accuracy Assessment
Mar 11	Graduate Student Presentations---		Accuracy Assessment
Mar 16	FINAL EXAM, 10:15am – 12:15pm, 16 PAC		

REMOTE SENSING II, SPRING 2015 TOPICS LIST

<i>Week 1</i>	<i>Review/Image Preprocessing</i>	<i>Ch. 11</i>
<i>Week 2</i>	<i>Plant Sciences</i>	<i>Ch. 17</i>
<i>Week 3</i>	<i>Hydrologic Sciences</i>	<i>Ch. 18</i>
<i>Week 4</i>	<i>Earth Sciences</i>	<i>Ch. 19</i>
<i>Week 5</i>	<i>Global Remote Sensing</i>	<i>Ch. 21</i>
<i>Week 6</i>	<i>Photogrammetry</i>	<i>TBD</i>
<i>Week 7</i>	<i>LiDAR</i>	<i>Ch. 8</i>
<i>Week 8</i>	<i>Hyperspectral Remote Sensing</i>	<i>Ch. 15</i>
<i>Week 9</i>	<i>Microwave/Radar</i>	<i>Ch. 7</i>
<i>Week 10</i>	<i>Thermal Remote Sensing</i>	<i>Ch. 9</i>