

GEOG 4830 Remote Sensing

Fall, 2008

Lecture: Tuesday 12:30-1:45 PM, Room 106
Lab: Thursday 12:30-1:45 PM, Room 107 (SPAM lab)

Instructor: Dr. Cuizhen (Susan) Wang

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Textbook

Jensen, J. R., 2006. Remote Sensing of the Environment: An Earth Resource Perspective. 2nd Edition. NJ: Prentice-Hall, Inc.

Course Description:

This course covers two primary techniques: photography/photogrammetry and electronic remote sensing. It explores the basic technical and methodological problems involved when airphotos or satellite images are used as a source of qualitative and quantitative information. Remote sensing is an interdisciplinary technique which can be applied in a number of areas including geography, forestry, agriculture, urban planning, landscape architecture, and rangeland management. The laboratory exercises will utilize both conventional aerial photographs and introductive digital image processing.

Grading Scheme:

	Lecture	Lab	
Quiz	5%		
Lab Exercises	----	20%	
Mid-term Lecture/Lab Exam:	25%	20%	
Final Lecture Exam:	25%	----	
Short essay (7830):			5%
Total score	55%	+ 40%	+ 5% = 100%

Geog7830 students are required to hand in a short essay at the end of this semester. Basic labwork is welcome but not required. The essay is 5% of the total score. Please refer to next page for details.

For example, if your average quiz = 90 points, lab grade = 80 points, Mid-exam = 95 points, Mid-term lab exam = 60 points, final exam = 93 points, and essay = 100 (always

100 for 4830), then your final score =
(90*0.05+80*0.2+95*0.25+60*0.2+93*0.25+100*0.05) = 84.5. **The blackboard automatically gives the weighted grades.**

The final grade is upon the histogram of total scores of all students. Different rule will be applied to 4830 and 7830.

Short Essay (7830 only)

The essay could relate to **one specific remote sensing application in environmental problems**. Any type of remote sensing topics/applications that we learn in this course will be OK. It could be application of airphoto or satellite imagery. During the class time please keep in mind what remote sensing can do in our everyday life. Your essay needs to outline the following:

- Problem: What environmental problem? Why do we need remote sensing in addressing this problem?
- Technique: in which way remote sensing can help? Image types, bands, dates, spatial resolutions, etc. The technical background that such data can help. No complex image processing needed.
- Give at least one figure to illuminate the problem and possible application of remote sensing image(s).
- Discussion: any comments on your study. advantages/disadvantages, improvement in the future, etc.
- Reference, if there is any.
- (size 12 Times New Roman, double spaced, 4-5 pages.)

Please focus on **one and only one** research problem. You are not required to give an introduction of RS applications on everything. Try to think that you have a big group of audience who want to know certain information (e.g. water quality, crop stress, illegal farming/logging, building height, etc) but know nothing about remote sensing. Write your essay in a simple but clear way.

Academic dishonesty:

Cheating, plagiarism, and other forms of academic dishonesty will not be tolerated. Please refer to pages 8-10 of the student handbook for details regarding the University's policies on academic dishonesty. (<http://www.missouri.edu/~mbookwww/M-Book2002.pdf>)

Plagiarism is a serious offense and can result in failure of the class and possible dismissal from the University. General review:

1. You must cite ideas and concepts that you have read in another source and are incorporating into your assignments and paper.
2. You must ALWAYS cite direct quotes from other sources whether they are long or short.
3. Direct quotes must be enclosed in quotation marks or in the case of a long quote, you should separate and indent the quoted block. If you have questions or concerns about

whether a part of your writing would constitute plagiarism, please consult me BEFORE submitting your paper or project.

Late Policy:

Lab Assignments handed in late (after the deadline in each of your lab exercise) will receive a 5% penalty for each day late up to five weekdays. Assignments turned in more than 5 weekdays late will not be accepted for grading.

Talk to your instructor or TA if you need an exam/lab make-up. A “fair” excuse is needed.

Support Services for Students with Disabilities (ADA):

If you need accommodations because of a disability, if you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please inform me immediately. Please see me privately after class, or at my office.

Office location: _10A Stewart Hall_____ Office hours : _____

To request academic accommodations (for example, a note taker or extended time on exams), students must also register with the Office of Disability Services (<http://disabilityservices.missouri.edu>), S5 Memorial Union, 882-4696. It is the campus office responsible for reviewing documentation provided by students requesting academic accommodations, and for accommodations planning in cooperation with students and instructors, as needed and consistent with course requirements. For other MU resources for students with disabilities, click on "Disability Resources" on the MU homepage.

Week	Date	Lecture/lab topic	Reading (2nd Edition)
1	Aug. 26	Introduction to Remote Sensing	Chapt.1: 3-8; Chapt.3
	Aug. 28	<i>(No lab)</i> Fundamentals of Remote Sensing	Chapt.2: 38-56
2	Sept. 2	Aerial photography (1)	Chapt.4: 91-103 Chapt.6: 149-154; 163-166
	Sept. 4	<i>Lab 1: Intro to stereo view and air photos</i>	
3	Sept. 9	Aerial photography (2)	Chapt.4: 122-125
	Sept. 11	<i>Lab 2: B/W and color photos</i>	
4	Sept. 16	Film technology	Chapt.4: 104-115
	Sept. 18	<i>Lab 2: cont.</i>	
5	Sept. 23	Photogrammetry (1)	Chapt.6: 155-162; 168-172; 189-192
	Sept. 25	<i>Lab 3: Measurement methods (1)</i>	
6	Sept. 30	Photogrammetry (2)	Notes
	Oct. 2	<i>Lab4: measurement methods (2)</i>	
7	Oct. 7	Elements of Visual Interpretation	Chapter 5
	Oct. 9	<i>Lab 5: Visual Interpretation</i>	
8	Oct. 14	LULC system and application in agriculture	Readings
	Oct. 16	<i>Lab6: LULC classification</i>	
9	Oct. 21	Photo Interpreting: Urban/Forest	Notes
	Oct. 23	<i>Lab6: cont.</i>	
10	Oct. 28	Mid-term exam	
	Oct. 30	Mid-term lab exam	
11	Nov. 4	Electronic remote sensing: physical basis, image format and display	Chapt.7: 193-195
	Nov. 6	<i>Lab 7: Introduction of ERDAS/IMAGINE: Characteristics of common types of images</i>	
12	Nov. 11	EO systems: Landsat/SPOT	Chapt.7: 195-211; 222-229
	Nov. 13	EO systems: high spatial/temporal res.	Chapt.7: 212-218; 233-237;244-246

13	Nov. 18	Thermal remote sensing	Chapter 8
	Nov. 20	<i>Homework (no hand-in)</i>	
14	Nov. 25	Thanksgiving week, No class	
	Nov. 27	No lab	
15	Dec. 2	Microwave remote sensing	Chapt.9: 291-299; 305-308; 313-330
	Dec. 4	<i>Lab8: thermal and radar remote sensing</i>	
16	Dec. 9	Introduction to DIP and RS applications	Chapter 11-14 (reference)
	Dec. 11	(No lab) 7830 essay due	
17	Dec. 16	Final Exam (all lectures covered)	Tuesday, December 16 1:00 – 3:00PM