

Geography 460/560 Remote Sensing of the Environment

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Lecture: MW 1:00-1:50 pm in DH 121
Lab: Sec. A: W 8:00-9:50 am; Sec. B: Th 9:30-11:20 am; all in DH 101
Text: Remote Sensing and Image Interpretation, 6th Edition, by T.M. Lillesand, R.W. Kiefer and J.W. Chipman, Wiley and Sons, 2008.
Web site: <http://webcourses.niu.edu> (if you haven't used BlackBoard website before, please go to the website and click on Student Help button for general information)

Course Goal and Objectives

The overall goal of this course is to introduce students to the basic principles of remote sensing and demonstrate its applicability to different fields.

After successful completion of this course, students should be able to

1. explain electromagnetic radiation of an object and its interaction with the atmosphere
2. interpret aerial photos and satellite imagery
3. apply basic techniques of image processing to obtain meaningful information
4. understand the components and orbits of meteorological satellites
5. interpret satellite imagery pertaining to weather analysis and forecasting

Laboratory

The labs are designed to help students understand concepts and principles covered in lectures. Attending labs and completing them on time are mandatory.

For the second half of the class, you will be required to complete several online modules pertaining to satellite meteorology. Quizzes administered throughout the modules will determine your lab grade as their results will be sent to the lab proctor. Instructions will be given concerning the second half labs after the midterm.

Grading and Exams

This course is co-taught by two professors. In the first half of the semester, Dr. Luo will cover the basic theories and principles behind remote sensing, image processing, and environment related applications. In the second half of the semester, Dr. Bentley will cover meteorological related issues and applications. There will be one midterm (which covers the first half of the semester) and one final (which covers the second half of the semester).

For Dr. Luo's part, there will be online warm-up exercises and online practice quizzes. The warm-up exercise is designed based on the "Just-in-time teaching" pedagogy and intended to engage students in active learning. The weekly warm-up exercise will be composed of 2-5 short questions related to the content that will be covered that week. It is **due 12:00 noon every Wednesday**. Lectures will be adjusted based on your answers and needs. Each warm-up will only take about 10-15 minutes to complete. The grading of the warm-up exercise will be based

more on your effort and less on the correctness of your answer. The warm-up exercises account for 5% of your course grade. The on-line practice quizzes are designed to help you understand the material and prepare for the midterm and will not be used to calculate your course grade.

Your course grade is based on the following breakdown:

1st half semester: 5% warm-up exercise + 20% lab + 25% midterm

2nd half semester: 20% lab + 30% final

The grading scale is as follows:

Grade	Percent Range
A	>90%
B	80%-89%
C	70%-79%
D	60%-69%
F	< 60%

There will be no make-up exams after the scheduled exams are given. Should you have a schedule conflict, please talk to the instructor well before the exam date.

Receiving Assistance: Students are urged to contact us should they have questions concerning course materials and procedures. If you have a disability or any other special circumstance that may have some impact on your course work and for which you may require accommodations, please contact us privately early in the semester so that arrangements can be made with the Center for Access-Ability Resources (CAAR).

Additional requirement for GEOG 560: graduate students may be asked to answer more challenging questions in lab and/or exams.

Tentative Schedule of General Lecture Topics

Wk	Dates	Lecture	Chapters	Lab
1	8/24,26	Introduction	1	Lab Introduction
2	8/31,9/2	Electromagnetic radiation principles	1	Lab 1
3	9/9	Remote Sensing Data Acquisition	2,6	Lab 2
4	9/14,16	Radiometric and geometric correction	7	Lab 3
5	9/21,23	Image enhancement	7	Lab 4
6	9/28,30	Image classification	7	Lab 5
7	10/5,7	Change detection	7	Lab 6
8	10/12,14	10/12 Review; 10/14 Midterm		
9	10/19,21	Introduction to satellite meteorology		No Lab
10	10/26,28	Satellite orbits/Meteorological satellites		COMET Module
11	11/2,4	Met. Satellites/Image interpretation		COMET (cont.)
12	11/9,11	Image interpretation/Synoptic-scale cloud patterns		COMET (cont.)
13	11/16,18	Synoptic-scale cloud patterns/Meso-scale cloud patterns		COMET (cont.)
14	11/23	Mesoscale cloud patterns		COMET (cont.)
15	11/30,12/2	Mesoscale cloud patterns		COMET (cont.)