SYLLABUS

Forest Resources 3262 / 5262

Remote Sensing of Natural Resources and Environment

Spring Semester 2009

Course Description: The course is designed to provide students with a working knowledge of the principles and applications of remote sensing. It provides a survey of the concepts and techniques of remote sensing and image analysis for mapping and monitoring natural resources, environment and land use. Both photographic and digital sensing approaches are considered. The laboratory provides hands-on experience in interpretation of aerial photographs and an introduction to digital image analysis techniques, along with a practical / team project using remote sensing.

Lecture: 9:35-10:25 MWF, 110 Green Hall

Lab Sections: (1) 8:30-10:25 Tuesday, (2) 10:40-12:35 Tuesday, 203 Green Hall

Instructor: Dr. Marvin Bauer
Department of Forest Resources, 220-B Green Hall
Phone: 612-624-3703
E-mail: mbauer@umn.edu

Office hours: 10:30 - noon, Monday or by appointment

Teaching Assistant: Don Kilberg
Department of Forest Resources, 210-C Green Hall
Phone: 612-624-3459
E-mail: kilbe008@umn.edu

Text: "*Introduction to Remote Sensing*," Campbell (4th Edition, 2007)

Supplemental Text "*Remote Sensing and Image Interpretation,*" Lillesand, Kiefer & Chipman (6th Edition, 2008)

Grading:

	3262	5262	
Exam 1	20	20	
Exam 2	20	20	*Plus and minus*
Exam 3	20	20	*grades are given*
Lab work and quizzes	15	15	
Special lab project	25	25	
5262 project	--	10	

Exam Format: Multiple choice questions (example / study questions will be on the web)

Lecture Notes: Copies of lecture notes, with diagrams and figures, will be available in advance of class at: **http://rsclass.gis.umn.edu/**. It is recommended that you print a copy and bring it to lecture. **They are provided to assist you in taking notes; they are NOT a substitute for skipping lectures.**

Course Goals: ***Understand...***

- •Concepts and principles of remote sensing
- •Advantages and limitations of remote sensing
- •Methods and techniques of remote sensing
- •Applications of remote sensing to resource inventory, monitoring and analysis
- Potential of contemporary image processing and analysis systems
- Choices of remote sensing data, analysis approaches and their relationship to applications
- Interface between remote sensing and other geospatial technologies
- •How to plan and implement a remote sensing project
- Prospects for future sensing systems and applications
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Reading Assignments

The reading assignments in the class schedule include material in the texts by Campbell and Lillesand, Kiefer & Chipman. The text by Lillesand, Kiefer & Chipman while considered supplemental, is also excellent and is recommended for additional insights into the material.

You may also find it useful to read related chapters/sections in one or more of the other supplemental books that are on reserve in the Forestry Library. The perspective of a different author will often complement that of the first and add to or reinforce your understanding. Although specific readings in Jensen or Avery and Berlin are not listed, the various topics can be easily found -- *if you want to look at additional texts*.

The materials listed in italics in the lecture schedule are on reserve in the Forestry Library.

It is highly recommended that you read the assigned material prior to the lecture. Key concepts and points will be emphasized in lecture. Material in lectures will supplement that in the reading assignments; you will be responsible for both on exams.

Books on reserve that could be useful additional references include:

Introduction to Remote Sensing, *Campbell (2007)*
Remote Sensing and Image Interpretation, *Lillesand, Kiefer & Chipman (2008)*
Remote Sensing for GIS Managers, *Aronoff (2005)*
Remote Sensing of the Environment: An Earth Resource Perspective, *Jensen (2006)*
Fundamentals of Remote Sensing and Image Interpretation, *Avery and Berlin (1992)*
Aerial Photography and Image Interpretation, *Paine & Kiser (2003)*
Our Changing Planet: The View from Space, *King et al., eds. (2007)*
Looking at Earth, *Strain & Engle (1992)*
Satellite Atlas of the World, *National Geographic (1998)*
Earth from Above, *Parkinson (1997)*
Manual of Photographic Interpretation, *ASPRS (1997)*
Elements of Photogrammetry, *Wolf (1983)*

Other Reference Materials

There will be several notebooks on reserve with collections of materials not completely covered in any of the texts or other books. Topics include:

Math Review (especially helpful for photo geometry problems)
Annotated examples of color infrared aerial photography
Applications of Landsat and SPOT data
AVHRR data and its applications
Geographic information systems
Global Positioning System
Applications of Landsat data to monitoring land and water resources in Minnesota
Applications of remote sensing to ecology and global change
Future satellite remote sensing systems

GRADES, ACADEMIC DISHONESTY, AND WORKLOAD EXPECTATIONS

Grades:

A -- achievement that is outstanding relative to the level necessary to meet course requirements.

B -- achievement that is significantly above the level necessary to meet course requirements.

C -- achievement that meets the course requirements in every respect.

D -- achievement that is worthy of credit even though it fails to meet fully the course requirements.

S -- achievement that is satisfactory, which is equivalent to a C- or better.

F (or N) -- Represents failure (or no credit) and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an Incomplete.

I -- (Incomplete) Assigned at the discretion of the instructor when, due to extraordinary circumstances, e.g., hospitalization, a student is prevented from completing the work of the course on time. Requires a written agreement between instructor and student.

Plus and minus grades will be given.

Academic dishonesty in any portion of the academic work of the course shall be grounds for awarding a grade of F or N for the entire course.

Workload: It is expected that in addition to the three hours in lecture and two hours of lab, students will need to spend an additional three to four hours a week on outside study and project work, or a total of eight to nine hours per week, to achieve an average or satisfactory grade in the course. While grades tend to be correlated with amount of time devoted to study and work, they are based on the quality of the work, not the hours of effort.