

**FNR 357: Fundamental Remote Sensing
Fall of 2011**

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Class Goals:

- ◆ Introduce the fundamental principles and methods of remote sensing technology.
- ◆ Demonstrate the applications of aerial photographs and satellite imagery in natural resource measurement and management.
- ◆ Introduce the concepts of digital processing and analyses of remotely sensed data.
- ◆ Practice the use of analog and digital remotely sensed data in computer mapping and problem solving.

Reference Books:

Fundamentals of Remote Sensing and Airphoto Interpretation. By Thomas E. Avery and Graddon L. Berlin. 1992. Prentice-Hall, Inc.
Remote Sensing and Image Interpretation (6th edition). By Thomas M. Lillesand and Ralph Kiefer. 2008. John Wiley & Sons, Inc.
Introductory Digital Image Processing (3rd edition). By John R. Jensen. 2004. Prentice-Hall, Inc.
Remote Sensing for Sustainable Forest Management. By Steven E. Franklin. 2001. Lewis Publishers.

Internet Source:

<http://rst.gsfc.nasa.gov/>

Lecture: Two lecture meetings per week: M. W. 10:30am – 11:20am, PFEN 203

Lab: One lab per week: T. 1:30am – 4:20pm, PFEN 202

Office Hours: Students may stop by instructors' offices any time, and instructors will see students as long as he/she is neither with someone nor rushing to finish something. You can also send an email for any questions, he/she will response ASAP.

<u>Grading:</u>	Exams	50+100 =	150 points
	Quizzes with irregular time intervals	20*5 =	100 points
	Projects	50+100	150 points
	Labs and Assignments		100 points
	Total		500 points

Deductions: 10 points for not turning in any lab or assignment on time.

Grading Scale: Total number of points for each student will be converted into a 100 scale.
Grade will be given according to this table:

Grade	GPA Value	Range
A+,A	4.0	93-100
A-	3.7	90.0 - 92.9
B+	3.3	87.0 - 89.9
B	3.0	83.0 - 86.9
B-	2.7	80.0 - 82.9
C+	2.3	77.0 - 79.9
C	2.0	73.0 – 76.9
C-	1.7	70.0 – 72.9
D+	1.3	67.0 – 69.9
D	1.0	63.0 – 66.9
D-	0.7	60.0 – 62.9
F	0.0	< 60.0

Policies:

1. Class discussion is encouraged. Please feel free to ask questions during class;
2. If you a student find it necessary to miss a class, it is his/her responsibility to arrange for obtaining the information covered;
3. Students are encouraged to read other books and reference papers.

Outline:

Week 1 (08/22 – 08/26)

Introduction to Remote Sensing and Aerial Photography

Lab – Getting to know remote sensing facilities

Week 2 (08/29 – 09/02)

Cameras, Films, Filters, and Photographs

Lab – Getting to know and use aerial photographs

Week 3 (09/05 – 09/09) (Labor Day: 09/06)

Electromagnetic Radiation (EMR) and Its Atmosphere Interactions

Lab – Generating stereograms

Week 4 (09/12 – 09/16)

Scale and Resolution

Lab – Display and Compare Satellite Remote Sensing Data

Week 5 (09/19 – 09/23)

Color Formation, Displacement, and Acquisition of Aerial Photographs

Lab – Handling Digital Remote Sensing Data

Week 6 (09/26 – 09/30)

Band Transformation and Satellite Data Acquisition

Lab – Band Transformation

Week 7 (10/03 – 10/07)

Class review (Mon) and Exam 1 (Wed) (100 points)

Lab – Working on Mid-Term Project

Week 8 (10/10 –10/14) (Fall break: 10/10-11)

Working on Mid-Term Project (no class meeting)

Week 9 (10/17 –10/21)

Satellite Data Characteristics and Vegetation Remote Sensing

Lab – Mid-Term Project Reporting (PPT Presentations) (50 points)

Week 10 (10/24 –10/28)

Image Statistics and Digital Classification

Lab – Computing Image Statistics

Week 11 (10/31 –11/04)

Accuracy Assessment and Change Detection Techniques

Lab – Examination of NLCD data and TM Data Classification

Week 12 (11/07 –11/11)

Advanced Classification Methods

Lab – Examination of NLCD data and TM Data Classification

Week 13 (11/14 –11/18)

Class Review and Final Project Introduction

Exam 2 (50 points)

Lab – Final Project

Week 14 (11/21 –11/25) (Thanksgiving vacation 11/23-25)

Remote Sensing Demonstration and Final Project Continues

Lab – Final Project Continues

Week 15 (11/28 – 12/02)

Working on Final Project

Lab – Work on Final Project

Week 16 (12/05 – 12/09)

Class Project Presentations (100 points)

Week 17

Class Ends