

**FNR 357: Fundamental Remote Sensing
Fall of 2008**

Instructor: Guofan Shao, Office: PFEN 221B, Phone: 43630,
E-mail: shao@purdue.edu
Yue Wu, Office: FORS 206, Phone: 48086,
E-mail: wu29@purdue.edu

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 Gradon L. Berlin. 1992. Prentice-Hall, Inc. ISBN: 0-02-305035-7.
Remote Sensing and Image Interpretation (3rd edition). By Thomas M. Lillesand and Ralph Kiefer. 1994. John Wiley & Sons, Inc. ISBN: 0-471-57783-9.
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. ISBN: 1-56670-394-8.

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. 11:30am – 2:20pm, 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 question, he/she will response ASAP.

Grading:

Exams	100 * 2 =	200 points
Quizzes with irregular time intervals	20 * 5 =	100 points
Final Project		100 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 (08/25 – 08/29)

Introduction to Remote Sensing and Aerial Photography
Lab – Getting to Know remote sensing facilities

Week 2 (09/01 – 09/05) (Labor Day: 09/01)

Electromagnetic Radiation (EMR) and Its Atmosphere Interactions
Lab – Getting to know and use aerial photographs

Week 3 (09/08 – 09/12)

Cameras, Films, Filters, and Photographs
Lab – Generating stereograms

Week 4 (09/15 – 09/19)

Scale and Resolution
Lab – Acquire and Use Topographic Maps

Week 5 (09/22 – 09/26)

Color Formation, Displacement, and Height Calculation
Lab – Determining Camera Height and Photo Scale

Week 6 (09/29 – 10/03)

Class Review and Exam 1

Lab – Display and Compare Airborne Remote Sensing Data

Week 7 (10/06 – 10/10)

Acquisition of Aerial Photographs and Basics of Cartography

Lab – Display and Compare Satellite Remote Sensing Data

Week 8 (10/13 –10/17) (October break: 10/13-14)

Digital-Format Remotely Sensed Data I

No Lab

Week 9 (10/20 –10/24)

Digital-Format Remotely Sensed Data II and Histogram, Image Statistics & Spectral Enhancement

Lab – Display and Compare Satellite Remote Sensing Data

Week 10 (10/27 –10/31)

Band Transformation and Geometric Corrections

Lab – Spectral Enhancement and Resolution Merge

Week 11 (11/03 –11/07)

Class Review and Exam 2

Lab – Perform Digital Classification

Week 12 (11/10 –11/14)

Digital Classification and Accuracy Assessment

Lab – Accuracy Assessment

Week 13 (11/17 –11/21)

Change Detection Techniques and Class Project

Lab – Change Detection

Week 14 (11/24 –11/28) (Thanksgiving vacation 11/26-28)

Remote Sensing Demonstration and Final Project Continues

Lab – Perform Change Detection

Week 15 (12/01 – 12/05)

Work on Final Project

Lab – Work on Final Project

Week 16 (12/08 – 12/12)

Class Project Presentations

Week 17

Class Ends