

## *Natural Resources 757/857, Geography 757* *Photo Interpretation and Photogrammetry*

Purpose of Course : To provide the student with a working knowledge and appreciation of the principles and practices of photogrammetry and photo interpretation, primarily for natural resource management.

Prerequisites: Strong working knowledge/practice of algebra with emphasis on word problems.

Instructor : Dr. Russell G. Congalton      Office: 217 James Hall  
Phone: 862-4644    868-3688 (home)  
Office Hours: MW 10-11 and T 9-11 or just knock

Examinations: 1. Monday, Oct. 8 -worth 125 points  
2. Wednesday, Nov. 14 -worth 125 points  
3. Final (cumulative) Dec. 18 (Tues.) 1 - 3 pm - worth 200 points

**FYI: ALL Labs and Homework available on Blackboard.**

Laboratories: 12 labs (10 labs @ 10 points each and 2 labs @ 20 points) - 140 points  
Unless otherwise specified, all labs are due at the beginning of the next lab period.  
Unless prior arrangements have been made with the instructor, no credit will be given for late labs. Please see me to make prior arrangements.  
(**NEATNESS COUNTS** - the instructor reserves the right to deduct 3 points on each lab for excessive sloppiness.)

Homework: Due at the beginning of class on the date specified on the assignment. Unless prior arrangements have been made with the instructor, a 1 point per day penalty will be imposed on all late homework.  
7 Homework assignments (6 @ 15 points each & 1 @ 20 points) - Total = 110

Grading (700 total points) Used as a general guide for you and me.  
635 - 700 = A (90.7%) (+ and - grades will be used)  
570 - 634 = B (81.4%)  
505 - 569 = C (72.1%)  
440 - 504 = D (62.9%)

Text: Paine, D and J. Riser. 2003. Aerial photography and image interpretation 2<sup>nd</sup> edition. John Wiley and Sons. New York. 632 pp.

Required Lab Supplies:

The student must bring the following to all labs (failure to bring necessary supplies results in 0 points for that lab)

- aerial photos (purchased from instructor; special fee)
- ruler graduated in mm and 0.1 inches
- calculator
- single matte acetate (3 mil, 10"x14", 4 sheets needed)

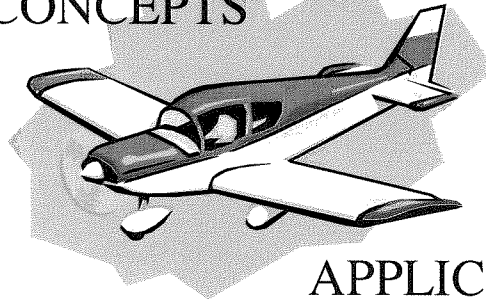
Academic Dishonesty Policy: You must do your own work on all homework and exams. Labs are a learning exercise and student interaction is expected. You must prepare your own individual lab reports. Academic dishonesty is unacceptable and will result in an automatic course grade of F. Please come see me if you need any help.

### **Course Objectives:**

1. To insure that each student has a working knowledge of the properties and characteristics of aerial photographs.
2. To insure that each student has knowledge of:
  - a. which characteristics of the forest can be mapped and/or measured from aerial photographs, and
  - b. the different techniques available for mapping and/or measuring these forest characteristics, and
  - c. how accurately and precisely these forest characteristics can be mapped and/or measured from aerial photographs.
3. To insure that each student has knowledge of:
  - a. how to define the type of photography needed to fulfill the user's stated objectives, and
  - b. where existing aerial photography which fulfills his/her objectives may be located, and
  - c. how to obtain new aerial photography, if necessary.
4. To insure that each student has knowledge of:
  - a. current applications of remote sensing to natural resource management and related fields,
  - b. future applications of remote sensing to natural resource management and related fields.

## **TEACHING/LEARNING PHILOSOPHY**

**CONCEPTS**



**APPLICATIONS**

## *Photo Interpretation and Photogrammetry*

### *Tentative Lecture Outline*

<u>LECTURE</u>	<u>TOPIC</u>	<u>READING (from text)</u>	<u>Homework</u>
1	Conduct and motivation of course		
2, 3	Intro to electromagnetic energy	pp. 1-10, Ch. 26	
4, 5	Cameras, color theory	Ch. 14, & color theory paper & color theory powerpoint	HW #1 Color Theory
6, 7	Films, filters	Ch. 13 & 14	HW #2 Practicals
8	Photointerpretation and Mapping	Ch 11 & 15 required Ch. 16, 17, 18, 19, 20, 21 – pick appropriate ones	
9	Photo geometry, stereo viewing	Ch. 3 & 8	
10	Exam #1 (Mon, Oct 8)		
11	Exam Review		
12, 13	Photo Scale	Ch. 4	HW #3 Scale
14, 15	Object heights	Ch. 6	HW #4 Heights
16	Area estimation	Ch. 5	HW #5 Area
17 - 19	Flight Planning	Ch. 7 & handout	HW #6, #7 Existing Imagery Flight Planning
20	No Class (Holiday)		
21	TUESDAY (but follow a Monday Schedule) Review for exam		
22	Exam #2 (Wed., Nov. 14)		
23	Exam Review		
24	No Class (Wed. of this week, Nov. 21 follows a Friday schedule)		
25	Introduction to GPS	Ch. 9	
26, 27	Digital Imagery	Ch. 28 & 23	
28, 29	Geographic Information Systems	ABC's of GIS paper	
30	Review for final exam		

*Photo Interpretation and Photogrammetry  
Tentative Lab Schedule*

<u>WEEK</u>	<u>LAB</u>	<u>TOPIC</u>
1		NO LAB (First week of classes)
2	1	Stereoscopy and Photo Interpretation
3	2	Preparation for Field Trip & Preliminary PI
4	3	Field Trip (be prepared rain or shine – Field Clothes)
5	4	Point Transfer, Photo Preparation, Initial Type Mapping
6	5	Additional PI & Demonstration of Advanced Equipment
7	6	Type Mapping
8	7	Scale Measurements (20 points)
9	8	Area Estimation
10	9	Vertical Measurements (20 points)
11		NO LAB (there is no Tuesday during this week)
12	9	Vertical Measurements continued
13	10	Quantitative Analysis of Final Type Map
14	11	GPS/Imagery Change Detection
15	12	Digital Imagery/ Image Classification