

GEOGRAPHY/NRES 460
Analysis and Interpretation of Aerial Photography
Spring 2016

Time: Monday 9 -9:50 a.m. Wednesday 9 – 10:50 a.m.

Place: 338 Davenport Hall

Instructor: Bruce L. Rhoads, Professor
131 Computer Applications Bldg.
brhoads@illinois.edu

Course Description: A review of methods for extracting quantitative and qualitative information from aerial photographs using GIS-based and visual techniques. The first part of the course will cover basic principles of photogrammetry. The second part will focus on mapping. The third part will develop skills related to interpretation of cultural and physical features.

Text: Aerial Photography and Image Interpretation (3rd ed.), by David Paine and James D. Kiser. Wiley. 2012.

Format: Generally, one class period per week will be devoted to lectures and the other will be used to work on lab exercises, although toward the end of the course more time will be devoted to lab work. .

Exams: Three exams will be given: 2 midterms and a final. The exams will include material from lectures and labs.

Project: Undergraduates will complete an individual mapping project using digital aerial photos. Graduates students are expected to conduct analysis related to their thesis or dissertation research, or a related topic. Detailed instructions will be provided after completion of the map exercise. Final projects must be typed; should include appropriate illustrations, diagrams, and maps; and are due May 4. **NO LATE ASSIGNMENTS WILL BE ACCEPTED.**

Grading:	Three exams (100 pts each)	52%
	Class Mapping Project (100 pts)	17%
	Individual Mapping Project (100 pts)	17%
	Lab Assignments (80 pts)	14%

Labs will be self-graded by you after the due date. I will check that you have turned in the lab on time and that you have self-graded it and then assign points accordingly (5 points for completing the lab and turning it in on time, 5 points for self-grading all of the questions once I give you the answer key).

Outline of Topics

- Jan. 20 Introduction: Hand out syllabus, Review course content
- Jan. 25 Lecture: Basic Photography, Film Types, Availability of Aerial Photography
Reading Assignment: Chapter 1, Chapter 14 pp. 262-277; Chapter 7, pp. 131-135.
- Jan. 27 ArcGIS Basics
- Feb. 1 Lecture: Geometry of Vertical Aerial Photographs
Reading Assignment: Chapter 2 and Chapter 4
- Feb. 3 Lab 1: Principal Points, Photo Scale, Topographic Displacement
- Feb. 8 Lecture: Horizontal and Vertical Measurements (**Lab 1 due**)
Reading Assignment: Chapter 5, Chapter 6 pp. 105-107
- Feb. 10 Lab 2: Measurement of distance, angles, areas, object heights (**Lab 1 grading due**)
- Feb. 15: Lecture: Theory of Stereoscopy (**Lab 2 due**)
Reading Assignment: Chapter 3
- Feb. 17: Lab 3: Preparation of Photos for Stereoscopic Viewing (**Lab 2 grading due**)
- Feb. 22 Lecture: Stereoscopic Parallax and Height Determinations (**Lab 3 due**)
Reading Assignment: Chapter 6, pp. 108-126
- Feb. 24 Lab 4: Height Determinations by Stereoscopic Methods (**Lab 3 grading due**)
- Feb. 29 Lecture: Planimetric Mapping - Introduction: steps in construction, coordinate systems (**Lab 4 due by class; Lab 4 grading due by 8 pm**)
Reading Assignment: Chapter 9
- Mar. 2 *Exam 1: Lecture and Lab*
- Mar. 7 Lecture: Planimetric Mapping - Horizontal Control and Transfer of Detail
Reading Assignment: Chapter 10, Chapter 11, pp. 211-222, Chapter 12.
- Mar. 9 Mapping Project: Part 1: Image Rectification
- Mar. 14 Lecture: Topographic Mapping, Orthophotos, Mosaics
Reading Assignment: Read Chapter 7, pp. 145-148, Chapter 8, Chapter 11 pp. 222-231, Chapter 18
- Mar. 16 Mapping Project: Part 2: Photo Mosaiking
- Spring Break**
- Mar. 28 Lecture: Principles of Photointerpretation
Reading Assignment: Read Chapter 15
- Mar. 30 Mapping Project: Part 3: Map Production

- Apr. 4 Lecture: Low-level Aerial Mapping with UAVs/Individual Mapping Project (**Mapping Exercise Due**)
- Apr. 6 *Exam 2: Lecture and Lab* (Also includes material from Chapters 27 and 28)
Rectification, Mosaicking
- Apr. 11 Lecture and Lab: Geologic Features
Reading Assignment: Chapters 16 and 17
- Apr. 13 Lab 5: Geologic Features
- Apr. 18 Lecture and Lab: Landforms (**Lab 5 due**)
Reading Assignment: Chapters 16 and 17
- Apr. 20 Lab 6: Landforms (**Lab 5 grading due**)
- Apr. 25 Lecture and Lab: Vegetation, Soils, Agriculture, and Urban Features (**Lab 6 due**)
Reading Assignment: Chapter 21; Chapter 20 pp. 397-400
- Apr. 27 Labs 7 & 8: Vegetation; Soils, Agriculture, and Urban Features (**Lab 6 grading due**)
- May 2 Lab: Vegetation, Soils, Agriculture, and Urban Features (**Lab 7 due**)
Assignment:
- May 4 Lab. 8: Soils, Agriculture, Cultural Features (**Lab 7 grading due, Lab 8 due, Individual Project Due**)
- May 6 **Lab 8 grading due**
- TBA: *Exam 3: Finals Week*