GIS 4021c Aerial Photo Interpretation
3 Credit Hours

Marco Island, Florida in 1940 and in 2003. Image on left from Open-File Report 02-327 - Historical Aerial Photography for the Greater Everglades of South Florida: The 1940, 1:40,000 Photoset

SYLLABUS as of 22 Aug 2017
Fall 2017
Section 1F82 & 1F83

Instructor: Dr. Michael W. Binford
Grader & Mentor: Dr. Yin-Hsuen Chen
Office: 3138 Turlington Hall
E-mail: eisen520@ufl.edu

Class Time and Place: UF Online; Web-based Class

Office Hours with Chen: Wednesday 9:30 – 12:30 AM EST or by Appointment

Course Website: Log in to Canvas at http://lss.at.ufl.edu

Course Communications: As discussed in 'Getting Started' you should post general course content questions to the discussion board. Personal questions should be sent via email on Canvas or Chen's ufl e-mail (eisen520@ufl.edu).

Description: Introduction to the analysis and interpretation of aerial photographs. Aerial photo interpretation is the art and science of obtaining reliable quantitative (measurements) and qualitative (thematic, e.g. land-cover classification) information from aerial photographs, and the determination of the nature and significance of objects on the surface of the earth.

Prerequisites: GEO 2200 (Physical Geography) or equivalent, College-level Statistics or Quantitative Analysis in Geography are required, and College-level Algebra, very basic Trigonometry are advised.

Required Textbooks:

- Paine, D.P. and J.D. Kiser. 2012. Aerial Photography and Image Interpretation. 3rd Ed. John Wiley & Sons, Hoboken, NJ.
- Wanless, H.R. 2002. Aerial Stereograms: An introduction to geology, geography, conservation, forestry, and surveying using stereo photographs. Hubbard Scientific. (can be found in following links:
    - http://www.ascscientific.com/stereos.html)
    - http://www.amazon.com/American-Educational-Aerial-Photographs-Individual/dp/B005QDR1MG
    - https://www.wardsci.com/store/catalog/product.jsp?catalog_number=320124
    - http://www.flinnsci.com/store/Scripts/prodView.asp?idproduct=15332

Required Equipment:

Pocket Stereoscope:

Students will purchase their own stereoscope. The stereoscope can be as elaborate as you wish. You have many options, from inexpensive ($6.25) to the very expensive (well over $4000). The more you pay, the better the optics, the easier to use, and the more comfortable you will be. See the following vendors for stereoscopes, but note that any vendor who sells stereoscopes will be OK:

- http://www.forestry-suppliers.com/search.asp?stext=Stereoscopes (This page has a selection of stereoscopes).
- http://www.ascscientific.com/stereos.html
- http://www.benmeadows.com/search/stereoscope

Purpose of Course: For students to learn the principles and practices of aerial photo interpretation for use in environmental science and monitoring, geography and other geosciences, Earth sciences, forestry, natural resource management, and other fields.

Course Goals/Objectives: By the end of this course you will have the ability to translate aerial photographs into useful descriptions of landscapes, e.g. reports, tables, figures, and maps. This ability includes 1. Acquiring analog and digital aerial photos, 2. Analyzing them with analog and digital tools, 3. and creating presentations and writing reports that communicate the analysis to others.

Teaching Philosophy: The University of Florida is a learning institution, not a teaching institution. Students are simultaneously raw material, investors, and builders of the "product," which is themselves. This means that the instructor's responsibility is to create an environment in which a student can learn in the most effective and useful way, and the student's responsibility to create his or her own learning by conducting all of the assignments, participating in all of the discussions, and generally using the learning environment. Instructors do not "give" grades; students learn by creating products, exams, quizzes, reports, discussion participation, workshops and laboratories that are evaluated by the instructor. Students earn their grades.

Instructional Methods: *Online format with* Textbooks Paine and Kiser (2012) $113 for ebook *and* Wanless (1998) $16.23

- Textbook reading, Reading and calculation quizzes, Video Lectures, Workshops, Semester Project. Web-site searching, reading, manipulating, finding and downloading images, analyzing and interpreting images.
- Workshops/Labs; Hands-on interpretative work with analog and digital maps, aerial photographs, some satellite images. All workshops have a short video introduction and written responses to questions.
- Semester-long project with milestones and final report (peer and faculty graded) or video presentation (peer and faculty graded).
- Instruments: ruler/straightedge, protractor, clear transparency pages, fine-point marking pens, masking tape, stereoscope
- Software: Access to UF APPS - ArcGIS

Grading Policy: Grades will be assigned as:

A	≥ 92%
A-	90 – 91.9%
B+	88 – 89.9%
B	82 – 87.9%
B-	80 – 81.9%
C+	78 – 79.9%
C	70 – 77.9%
C-	68 – 69.9%
D+	66 – 67.9%
D	60 – 65.9%
D-	58 – 59.9%
E	< 60%

See https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx for details.

Assignment	%
Laboratory Exercises	44%
Weekly Reading Comprehension Quizzes	15%
Semester Project	31%
Discussion Board Participation	10%

Make-up Policy: **No make-up quizzes will be given under any circumstances, and no late assignments will be accepted without very important reasons.** You must provide appropriate documentation and the instructor will decide whether a reason is important. You have at least a week to complete every assignment. If you have technical difficulties you must notify the help center: Learning-support@ufl.edu (352) 392-HELP - select option 2
https://lss.at.ufl.edu/help.shtml
Any requests for make-ups due to technical issues MUST be **accompanied by the ticket number** received from LSS when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail Chen within 24 hours of the technical difficulty if you wish to request a make-up.

Attendance Policy: This is an online course, so attendance is not required, but if you do not finish video lectures and workshops, you will miss both the information covered in discussions and quizzes.

Course Technology: Students will learn the basics of and use the software programs ArcGIS through the UF APPS Web site (https://info.apps.ufl.edu/), and will use an on-screen measurement system called MBRuler.

Semester Project: Students will conduct a semester-long project that consists of developing a research or project question, planning an analysis to answer the question, acquiring aerial photos appropriate for the analysis, interpreting and analyzing the aerial photos, and writing a short report with text, maps, data display with tables and figures. A model project may be a RFP from the Federal Business Opportunities (FBO) site for aerial photo interpretation, modified for use in the class project. Students with more well-developed interests, e.g. senior honors thesis, University Scholars award, or any research interest can come up with their own projects. There are two due dates related to final project:

1. A written proposal about defining the question (e.g. FBO RFP) and identifying available aerial photos. Proposal should be full 3-page with literature references. **Due date October 22, 11:59 PM EST**
2. Report writing {alternative is Presentation of Results by video} with text, maps, data display with tables and figures. **Completion date for December 10, 11:59 PM EST**.

Schedule:

This schedule represents our current plans and objectives. As we go through the semester, those plans may change to enhance the class learning opportunity. Such changes, communicated clearly and as early as possible, are not unusual and should be expected. We will try to make no changes at all. The milestone due dates for the Semester Project will not be changed.

Lecture/Workshops – Date is the Monday of the Week

- **August 21**
  - Module 1 - *Introduction, History and rudiments of aerial photography (Overview of Course)*
- **August 28**
  - Module 2: *Physics of Aerial Photography and sensor systems; coordinate systems and map reading*
  - Workshop: Reading Maps
- **September 5** (Note Monday is Labor Day)
  - Module 3: *acquisition programs, finding and acquiring aerial photographs*
  - Workshop: Aerial Photography Acquisition and Archive Programs
- **September 11**
  - Module 4: *Scale geometry and horizontal photo measurements:* Scale of Vertical Aerial Photographs; Horizontal Measurements--Distance, Bearings, and Areas
  - Workshop: Geometry and Horizontal Measurements

- **September 18**
  - Module 5: *Principles of stereoscopic vision & Parallax and vertical measurements*
  - Workshop: Stereovision and Aerial Photograph Interpretation.
- **September 25**
  - Module 6a: *introduction to arcgis and ENVI for digital aerial photography, making good maps and digital measurements with arcgis*
  - Workshop: Map making
- **October 2**
  - Module 6b: *introduction to ArcGIS for digital aerial photography, making good maps and digital measurements with ArcGIS*
  - Workshop: Digital Measurements and Change Analysis
- **October 9**
  - Module 7: *rectification and orthophotography*
  - Workshop: Ground Control Points, Rectification, Rectified Photograph Production
- **October 16**
  - Module 8: *aerial photo interpretation: landforms, rivers and drainage patterns, geology, soils*
  - Workshop: Landforms, rivers and drainage patterns, geology, soils
    - NOTE: **YOU WILL NEED THE WANLESS AERIAL STEREOGRAM BOOK** AND YOUR **STEREOSCOPE**

NOTE THAT the Three-page proposal for semester project due October 22, 11:59 PM EST

- **October 23**
  - Module 9a: *aerial photo interpretation: land-cover and vegetation classification*
  - Workshop: Land Cover Classification

NOTE THAT YOU SHOULD BE BEGINNING YOUR INTERPRETATION AND ANALYSIS OF THE AERIAL PHOTOS DURING THIS AND THE NEXT THREE TO FOUR WEEKS

- **October 30**
  - Module 9b: *aerial photo interpretation: land-cover and vegetation classification*.
  - Workshop: Vegetation analysis for natural resources inventories

- **November 6**
  - Module 10a *aerial photo interpretation: cultural landscapes: urbanization, environmental monitoring*
  - Workshop: Urbanization, Land-use Planning, Environmental Monitoring

- **November 13**
  - Module 10b *aerial photo interpretation: cultural landscapes: urbanization, environmental monitoring*
  - Workshop: Economic aerial photography: property tax assessor's office, crop subsidy compliance Workshop

- **November 22 – 25** THANKSGIVING BREAK

- **November 27**
  - Module 11: Drones and new developments in Aerial Photo Interpretation
- **November 4**
  - Module 12: Final report from students posted, discussed, evaluated

NOTE THAT THE PRESENTATIONS OR REPORTS ABOUT YOUR SEMESTER PROJECT ARE DUE December 10 AT 11:59 EST

Useful Links:

- U. F. Map and Imagery Library Aerial Photography Holdings http://web.uflib.ufl.edu/maps/Aerials/MAPNEWAERIAL.HTML
- Statewide Florida Aerial Photography Collections http://web.uflib.ufl.edu/digital/collections/FLAP/
- Florida Land Boundary Information System (LABINS: source of digital orthophoto imagery) http://data.labins.org/2003/index.cfm
- U.S. Geological Survey EarthExplorer - for all kinds of data including satellite remote sensing, national aerial photography programs, etc. Registration is free. https://earthexplorer.usgs.gov/

Fun Links:

GoogleEarth - Fly to anywhere in the world and look at the place with high spatial-resolution satellite imagery. Software is already installed on Geography machines.
TerraServer - Microsoft's version of aerial photography for the masses

Academic Honesty:

Students are required to do their own work on the exam and in the workshops. It is fine to consult with each other on how to make measurements, etc., but each of you must submit your own work separately except for the final project which is a group effort. The penalty for cheating is to receive zero points for that exam or paper, and the incident will be reported to the Student Honor Court.

University Policy on Academic Misconduct: Academic honesty and integrity are fundamental values of the University community. Students should be sure that they understand the UF Student Honor Code at http://www.dso.ufl.edu/students.php.

Students with Disabilities:
Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

University Policy on Accommodating Students with Disabilities: Students requesting accommodation for disabilities must first register with the Dean of Students Office (http://www.dso.ufl.edu/drc/). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the quizzes or exams. Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

****Netiquette: Communication Courtesy:** All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats.

Getting Help:
For issues with technical difficulties for E-learning in Canvas, please contact the UF Help Desk at:
Learning-support@ufl.edu
(352) 392-HELP - select option 2
https://lss.at.ufl.edu/help.shtml
** Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from LSS when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

Other resources are available at http://www.distance.ufl.edu/getting-help for:
Counseling and Wellness resources
Disability resources
Resources for handling student concerns and complaints
Library Help Desk support

Should you have any complaints with your experience in this course please visit http://www.distance.ufl.edu/student-complaints to submit a complaint.