

Forest Resource Information Systems

Summer 2019

FOR3434C : Undergraduate Section: 4102

FOR5435 : Graduate Section 4474

Dr. David A Fox

Forest Stewardship Cabin, [Bldg 844](#)

dafoxfl1@ufl.edu : (352) 846-0856

Office Hours: Tue & Wed 10:00 - Noon or email for appointment.

Joe Aufmuth

UF Marston Science Library, 301A

mapper@uflib.ufl.edu : (352) 273-0371



Lecture: Wednesday : Periods 5-6 (2:00p to 4:45p) [NZ 112](#)
Field Lab: Thursday : Periods 2-5 (9:30a to 3:15p) [Little Hall 0121](#) or Field
GIS Computer Lab: Friday : Periods 2-3 (9:30a to 12:15p) [MAEB 211](#)

“To develop a complete mind: Study the science of art; Study the art of science. Learn how to see. Realize that everything connects to everything else.” (Leonardo da Vinci)

Course Description

Nearly every topic imaginable associated with natural resource management has some spatial or geographic context. This course aims to develop spatial thinking through the use of geographic information system (GIS) tools. Understanding how the elements of geography, mapping, and database management connect to the physical world is key to answering questions related to “where” and “what”. The relative location of features (where) and their properties or attributes (what) can be overlain, combined, and analyzed to tell a richer story beyond simple facts.

Topics Covered will include: Map and compass use, introductory aerial photograph interpretation, Public Land Survey System of the US, map projections and coordinate systems, geospatial data sources and data collection, use of Global Positioning System (GPS) for data collection and navigation, basic database design, spatial and tabular data analysis, basic cartographic techniques and map layout, and examples of GIS use in the natural and physical sciences.

Course Essential Questions

- What are the building blocks of a geographic information system?
- How can different types of data be collected and displayed in a GIS to represent natural or human-built systems?
- How can GIS be used in natural resource management to ask questions and solve problems?

Course Objectives

Upon completing the course, students will be able to:

- Read maps and use a compass for field navigation;
- Understand the Public Land Survey System and use it to describe land parcels;
- Recognize map projections and their geodetic implications;
- Discover and use aerial and satellite imagery and other digital data sources;
- Create spatial data sets and organize them in a geodatabase;
- Practice basic vector and raster geospatial analyses;
- Create maps using appropriate cartographic standards.

Cornerstone Tasks

- **GIS Map and Summary Reports:** Written lab reports containing a map of activity results, a summary of activities, and answers to questions will be required. Assessment will be based on a report grading rubric.
- **Field Lab Reports:** Written lab reports describing field lab activities and synthesis of collected data. Assessment will be based on a report grading rubric.
- **Graduate Student GIS Project:** A narrated slide show will be presented live or recorded via Canvas Conferences during the last week of class. More information is available in Canvas Assignments.

Teaching Methods

- **Lectures:** Narrated PowerPoint lectures or live demonstrations will focus on presenting new information as well as that summarized from the assigned readings.
- **Assigned Readings:** Each week various book chapters, articles, and videos will be posted online prior to lecture. It is to your advantage to read these articles and view the videos as they will often reinforce information given in lecture, aid in field study, or contain information appearing on exams.
- **Field Labs:** Lab periods may happen in the classroom (LIT0121), on campus, or at a nearby location. Lab exercises are designed to provide students with hands-on experience with field methods, to reinforce lecture material, to observe a demonstration, or to hear from experts during guest lecture periods. Typically, a written lab report will be prepared based on the subject matter and instructions from the instructor.
- **GIS Activities:** Students will be supplied with step-by-step tutorials designed to demonstrate spatial information theory and familiarize them with ArcGIS software. Students will individually complete a summary report each week that includes a map, an activities summary, and answers to assigned questions. Prepare the reports to serve as personal tutorial notes for future reference.

- **Exams:** Two exams will be given covering lecture material, assigned readings, videos, and lab subjects. Feedback will be provided explaining answer insufficiencies.
- **Group Study:** Students will work in assigned groups to complete lab data collection, analysis, and certain reports. Students are encouraged to form small *ad hoc* study groups outside of class to reinforce concepts and to informally quiz each other on the course material presented.
- **Individual Study:** Each student will be expected to attend class and labs; detailed note-taking is encouraged. In addition, students should complete assigned readings, produce required lab reports, and spend individual time reviewing materials in advance of exams.

Grading

	<i>Undergrad</i>	<i>Grad</i>
<i>Exams (2):</i>	40%	40%
<i>GIS Lab Reports:</i>	30%	25%
<i>Field Lab Participation and Reports:</i>	25%	15%
<i>Class Participation:</i>	5%	5%
<i>Grad Student Project</i>	--	15%

- **Exams:** Timed comprehensive exams will be given at intervals during the semester. Students will complete the exam through the eLearning site Canvas. From the time you start the exam you will have 60 continuous minutes to complete the exam. The latest you can start the exam and have a full 60 minutes is 10:59pm. If you start after 10:59pm the exam will still end at 11:59pm. The exam is open book, notes, and lecture materials. You are under UF's Honor Code and must complete the exam on your own.
- **GIS Computer Labs:** GIS lab sessions will be conducted live and broadcast via Zoom Conferences on Fridays from 9:30a to 12:15p as well as be recorded for later viewing. These sessions will typically include a short lecture plus time to complete the exercise and receive in-class guidance. Students will be supplied with step-by-step tutorials designed to acquaint them with the features and functions of ArcGIS desktop software. We will use UF Apps to access ArcGIS software and all tutorial data. A laptop will be required to do the exercises in class.

Students will individually complete and submit a summary report each week that includes a map, an activities summary, and answers to assigned questions. Prepared reports can serve as personal tutorial notes for future reference. Evening help sessions will be arranged by appointment through Canvas Conferences.

- **Field Labs and Reports:** Field labs will be conducted live on Thursdays and attendance is required for all students. Each lab module posted in Canvas will contain the lab meeting location, topic, instructions, and deliverables specific to that lab session. Though data may be collected as a group, any required field lab reports shall be completed individually.
- **Participation:** Specific discussion topics will appear in Canvas under different weekly modules. In addition, you are encouraged to introduce new discussion topics that address issues you encountered and solutions devised, any software shortcuts you discover, relevant online content you find that helps explain a concept, or other resources you think might be helpful to course participants.

- **Graduate GIS Project:** All graduate students must complete a final project. Use this as an opportunity to explore the potential that GIS tools could bring to your research or professional interests. The deliverable will be a power point presentation illustrating, at the least, project objectives, methodology, data used and data created, analysis, results, and discussion. You will be expected to present your project to the class during the final Thursday lab session via Canvas conferencing software. Contact Dr. Fox early in the semester with your project ideas.

Final grading follows University standards based on the following scale (<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>):

Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
Course Score	93.0 - 100	90.0 - <93.0	87.0 - <90.0	83.0 - <87.0	80.0 - <83.0	77.0 - <80.0	73.0 - <70.0	70.0 - <73.0	67.0 - <70.0	63.0 - <67.0	60.0 - <63.0	0- <60.0
Grade Points	4	3.67	3.33	3	2.67	2.33	2	1.67	1.33	1	0.67	0

Resources

Required Text:

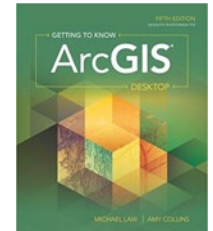
GIS Fundamentals (5th edition), Paul Bolstad (2016). Eider Press. ISBN: 9781506695877



Highly Recommended Workbook:

Getting to Know ArcGIS Desktop (5th Edition), Michael Law and Amy Collins (2018). ESRI Press. ISBN-13: 978-1589485105, ISBN-10: 1589485106

Note: *Getting to Know ArcGIS Desktop* serves as a reference text for exercises conducted in class. 4th or 5th edition is acceptable. New versions of the book come with a FREE 180-day version of ArcGIS (Windows only) although you will not need to install ArcGIS for this course.



Software: ArcGIS/ArcMAP is available on all computers in the Library system plus through UF Apps software portal.

Things you will need for this class:

- 1) A laptop with office software for written reports. You will need to bring your laptop to Friday computer lab.
- 2) **High-speed internet** to access the eLearning site Canvas and UF Apps from off-campus.. Exams are taken through Canvas and require access to a computer and the internet.
- 3) A way to take class and field notes.
- 4) **REQUIRED: Safety dictates appropriate outdoor clothing and footwear for field labs. Long pants and boots or closed-toed shoes are required. No shorts, leggings, flipflops or sandals will be permitted. You may be excluded from participating in field labs if**

inappropriately dressed. You may also get muddy, wet, and sweaty depending on the site conditions. Field labs happen rain or shine (nearby lightning or hail might send us scurrying to shelter).

- 5) A water bottle for field labs (a water cooler will be available for refills) plus sunscreen, long sleeves, and a hat to help prevent sunburn.

Additional Materials:

Use your GatorLink credentials to log into these web sites before our first meeting to make sure you can access the resources. Some software download and installation may be necessary to access UF Apps.

Contact the UF Help Desk (352) 392-4357 for assistance. <http://helpdesk.ufl.edu/>

Course Delivery Software: Canvas <http://elearning.ufl.edu>

Additional readings, videos, and recorded lectures will be available through Canvas modules.

GIS Software, and office software Access: UF Apps <https://apps.ufl.edu>

Canvas Conference Software:

Some class sessions and all GIS labs will be recorded using Canvas web conferencing software (Big Blue Button) for later student review. In addition, optional live evening software help sessions may be scheduled as needed or requested. Be sure to connect early and make sure your internet connection speed is sufficient. A headset or separate earphone and microphone are required for vocal participation. Otherwise, comments and questions can be entered into the included chat box if a headset is not available. Video camera is optional.

Attendance, Late Assignments and Make-Up Work

While class attendance is not part of your grade, the condensed nature of this course will require you to be focused, attentive, and taking notes during every class if you wish to be successful. Do not arrive late to class (let the instructor know early in the semester about any logistical issues that might result in habitual tardiness). If you must miss a lecture, get notes from other students

Attendance in field lab is mandatory and lab reports may only be turned in if you attend the field session as you will often be collecting data for use in GIS Lab. However, if there is a special circumstance covered by the UF attendance policy (<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>), please contact the instructor ahead of time.

It is your responsibility to keep track of assignment due dates and times as listed in Canvas. Most assignment due times will be 11:59pm or just before midnight. Assignments open and close based on the clock governing the Canvas server so submitting assignments at the last minute may prove troublesome for you – don't wait! A grace period, usually one day, will be added to each assignment due date during which late work will be accepted. Any late assignment scores will be reduced by 50% of the original point value and then be graded according to the rubric. No assignments will be accepted after the assignment closes so do not email them to an instructor.

Data storage/management and computer accessibility: The availability of inexpensive computer-connected storage devices (such as thumb drives) and pervasive online storage/backup

options (UF Apps, OneDrive, Google Drive, Dropbox, etc.) has made the loss of computer data nearly impossible. Use them! No excuses because of data loss! In the event of a personal computer crash, many computers are available for use in computer labs and libraries on campus. Start early and have a backup plan in mind so as to avert a missed assignment disaster.

Generally, no make-up assignments or exams will be offered other than for exceptional situations such as University-sanctioned absence, death of an immediate family member (pets not included), serious illness or injury (reported to the instructor with a physician's note within five days of the first absence), or extreme weather resulting in the closure of campus. Extra credit assignments are rarely, if ever, provided.

Potential Outdoor Environmental Hazards:

Field labs will be held outdoors. **If you are allergic to insect bites, or if you have other medical conditions for which emergency treatment may be required, it is your responsibility to inform the instructor before the course starts, about:** (1) your specific condition, (2) where you keep your medicine, and (3) how to administer emergency treatment should the situation arise.

Important information concerning certain hazards of working outside in Florida:

- Chiggers: <http://edis.ifas.ufl.edu/pdffiles/IG/IG08500.pdf> or <http://pherec.org/EntGuides/EntGuide6.pdf>
- Ticks & Lyme Disease: <http://edis.ifas.ufl.edu/pdffiles/MG/MG20400.pdf> or <http://fmeal.ifas.ufl.edu/buzz/clticks.shtml>
- Heat: http://solutionsforyourlife.ufl.edu/hot_topics/agriculture/heat_stress.html
- Dehydration: <http://fineinstitute.com/patient-education/?id=11913&lang=English&db=hlt&ebSCOType=static&widgetTitle=Spinal+Links>

Academic Honesty

In 1995 the UF student body enacted a new honor code and voluntarily committed itself to the highest standards of honesty and integrity. When students enroll at the university, they commit themselves to the standard drafted and enacted by students. The quality of a University of Florida education is dependent upon community acceptance and enforcement of the honor code.

***The Honor Code:* We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.**

On all work submitted for credit by students at the university, the following pledge is either required or implied: **“On my honor, I have neither given nor received unauthorized aid in doing this assignment.”**

It is assumed all work will be completed independently unless the assignment is defined as a group project, in writing by the instructor. This policy will be vigorously upheld at all times in this course.

Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>.

Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

University Counseling & Wellness Center

3190 Radio Road, (352) 392-1575, www.counseling.ufl.edu/cwc/

Counseling Services
Groups and Workshops
Outreach and Consultation
Self-Help Library
Training Programs
Community Provider Database

Office of Victim Services

1515 Museum Road, (352) 392-5648, <https://police.ufl.edu/about/divisions/office-of-victim-services/>

Career Resource Center

First Floor JWRU, (352) 392-1601, www.crc.ufl.edu/

Students with Disabilities

(352) 392-8565 www.dso.ufl.edu/drc/

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. **If you have registered with the Disability Resource Center and require academic accommodations, it is your responsibility to privately inform the instructor of your needs as soon as possible before the first class session.**

FOR3434C – 4102 / FOR5435 – 4474 : FRIS : 2019 Summer B Class Schedule

Week / Date / Loc		Topics
1	July 3 NZ 112	Lecture: Class Introduction, Field Lab Procedures, Mapping history, Intro to GIS, Spatial Data Models
	July 4 Canvas	Public Land Survey, Intro to Pacing, Map Reading, and Compass Use
	July 5 MAEB 211	GIS Computer Lab: Setting Up and Using UF APPS, Creating a Personal Work Directory, Intro to GIS Theory, Downloading and uncompressing GIS Data, Getting Started with ArcGIS/ArcMap, Creating a Map
2	July 10 NZ 112	Lecture: Intro to Coordinate Systems, Map projections, and Spatial Data Base Design
	July 11 NATL	Field Lab: Traverse a Course Using a Compass and Pacing at Natural Area Teaching Lab (NATL)
	July 12 MAEB 211	GIS Computer Lab: Creating Spatial Data – Points, Lines, and Polygons – from Georeferenced Aerial photographs, Managing Spatial Data – ArcGIS Geodatabases
3	July 17 NZ112	Lecture: Global Navigation Satellite Systems, Spatial Data Sources
	July 18 NATL	Field Lab: Area measurement at Natural Area Teaching Lab (NATL), and Capturing Coordinates with GPS for Use in GIS, Creating a Polygon from GPS Data.
	July 19 MAEB 211	GIS Computer Lab: Creating A Geodatabase, Creating Polygons from Field Lab GPS Data, GIS and Mission Planning for Field Lab Data Collection Using Aerial Photographs and Remotely Sensed Data
	July 19 Canvas	Mid Term Exam – ONLINE (covering weeks 1, 2, 3, not GIS Lab 3)
4	July 24 NZ112	Lecture: Aerial Photographs, Remotely Sensed Data, and Air Photo Interpretation
	July 25 ACF	Field Lab: Field Mapping with GPS
	July 26 MAEB 211	GIS Computer Lab: Prescribed Burn Areas Change Detection Analysis. Working with Remotely Sensed Data and Digitizing Polygons
5	July 31 NZ112	Lecture: Digital data, Basic spatial analysis
	August 1 NZ Breezeway	Field Lab: GPS Navigation (GeoCaching) Various Campus Locations
	August 2 MAEB 211	GIS Computer Lab: Austin Cary Timber Sale and Harvest: Spatial Overlay and Analysis, Buffer, Clip, Dissolve, Union, Intersect, Identity
6	August 7 NZ112	Lecture: Raster Analysis
	August 8 LIT 0121	Course wrap-up and Evaluation (9:30-10am), Graduate Project Presentation Brown Bag Lunch (10am to 1pm), Raster Analysis Demo (1pm-3:15pm)
	August 9 Canvas	Final Exam – ONLINE (covering weeks 4, 5, 6, and GIS Lab 3)
Subject to change – watch Canvas for updates and announcements		

ACF: Austin Cary Forest NATL: Natural Area Teaching Lab