UNIVERSITY OF CENTRAL ARKANSAS | Geography

Course Geography (GEOG) 3319: Geographic Field Techniques
Lecture: TR 2:40 pm- 3:55 pm
Location: Lewis Science Center 174

Instructor

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Office Location: Lewis 154
Office Hours: MW 10:00- 11:50 am

Course Description

Mobile and Web GIS have significantly enhanced how geospatial data are collected, managed, and shared. Data collection is no longer limited to specialized equipment; mobile devices now enable efficient, real-time field data acquisition. With mobile platforms serving as primary access points to cloud services, many industries have adopted a "mobile-first" approach in developing GIS-enabled applications.

Global Navigation Satellite Systems (GNSS) have greatly enhanced many aspects of daily life. This course introduces the fundamental concepts and theories of GNSS, including the use of GNSS receivers for positioning, navigation, tracking, and field data logging, as well as the integration of field data into GIS software. The course also covers the basics of Unmanned Aerial Vehicles (UAVs) and their combination with GNSS to collect high-resolution data. Finally, it explores various online mapping methods for visualizing and analyzing field-collected data.

Mobile GIS transforms fieldwork by integrating GPS, data capture, and cloud synchronization, making it a key component of modern GIS infrastructure. Web GIS, meanwhile, supports the full geospatial workflow – from data collection and storage to analysis and visualization – allowing users to create interactive web maps and applications accessible from anywhere.

This course introduces the foundations and applications of Mobile, GPS, drone and Web GIS, emphasizing their roles in streamlining spatial workflows and supporting data-driven decisions. Students will explore key tools such as ArcGIS Online, Field Maps, Survery123, and StoryMap. Through hands-on exercise and projects, students will learn how to design mobile GIS workflows and publish web-based mapping applications that effectively communicate geographic information.

Course Objectives

After completing this course, students will be able to:
1. explain Mobile GIS, and Web GIS principles and concepts
2. collect spatial data using cell phone through Field Map and Suvey123
3. implement field data into GIS software (Esri ArcGIS)
4. understand the integration of technology and teamwork in Mobile GIS operations
5. produce maps using ArcGIS online mapping technique
6. understand ArcGIS Living Atlas contents

7. Create multiple dynamic maps using ArcGIS StoryMaps and 3D Web Scene
8. Explain GNSS principles and concepts
9. fly UAV
10. process UAV image using GIS software

Course Framework

This course will use a combination of lectures, demonstrations, lab exercises, and field work. The instructor firmly believe that students learn via engagement and doing. As a result, large portions of the class time will be set for lad exercises and field work. It is important that you engage yourself during this class. The instructor will do her best to help you learn, however, it is imperative that you take ownership of your own education.

Recommended Text

1. *Getting to know Mobile GIS* by *Pinde Fu* (ISBN: 9781589487079)
2. *Getting to Know Web GIS, by Pinde Fu* (Esri Press, 5th Edition, ISBN: 9781589487079)
3. *Understanding GPS: Principles and Applications* edited by Elliott D. Kaplan and Christopher J. Hegarty (ISBN-10: 1580538940; ISBN-13: 9781580538947)
4. *Fundamentals of Capturing and Processing Drone Imagery and Data* edited by Amy E. Frazier and Kunwar K. Singh (ISBN 9780367245726)

Required software

1: ArcGIS online account, provided by Geography department
2: ArcGIS Pro 3.0, provided by Geography department

Table 1. Course Schedule

Week	Date	Tuesday	Thursday	Due Dates	Source Material
W1	Aug. 21-22	Summer Break	Course Introduction		
W2	Aug. 25-29	ArcGIS Online Accounts	Lab 01: ArcGIS Online	Sep 1	
W3	Sep. 1-5	ESRI Survey123	Lab 02: Data Collect with Survey123	Sep 8	Mobile Ch.3
W4	Sep. 8-12	Mapping with ArcGIS Field Maps	Lab 03: Data Collect with ArcGIS Field Maps	Sep 15	Mobile Ch.1
W5	Sep. 15-19	Responsive web maps in mobile	Lab 04: Dashboard	Sep 22	Mobile Ch.7
W6	Sep. 22-26	GPS Receivers & GPS Augmentation	Future and Application of GNSS	None	
W7	Sep 29-Oct. 3	GPS Practice in campus	Lab 05: GPS Practice	Oct 6	
W8	Oct. 6-10	Drone Overview	Lab 06: Drone Image Collection	Oct 13	

W9	Oct. 13-17	***Arkansas GIS User Forum: no class***	***Arkansas GIS User Forum: no class***		
W10	Oct. 20-24	Group Data Collection	Lab 07: Group Data Collection	Oct 27	Web Ch.1 & 2
W11	Oct. 27-31	Getting Started with Web GIS ArcGIS Story Maps	***SWAAG Conference: no class***	None	Web Ch.1 & 2
W12	Nov. 3-7	Spatial-temporal data	Lab 08: Real-time GIS	Nov 10	Web Ch.6
W13	Nov. 10-14	3D web scenes	Lab 09: Explore web scenes	Nov 17	Web Ch.7
W14	Nov. 17-21	Programming in Web GIS	Lab 10: Explore programming in web	Nov 24	Web Ch.10
W15	Nov. 24-28	***Thanksgiving Break***			
W16	Dec. 1-5	***Project Analysis***			
W17	Dec. 8-12	***Project Presentation***			

Grading

Grading for this course will consist of ten lab exercises, and a project. The detailed showed in the Table 2 and Table 3.

It is important that all lab exercises be completed in a timely manner. Some bonus exercises maybe provided. ***Labs and assignments that are not turned in by the due date can be turned in up to 2 days late with a 20% penalty.*** Labs will not be accepted after this 2-day period.

Table 2 Grade distribution

Item	Points	Description
Lab exercises	50 points each, 500 points total	10 lab exercises. Each will be provided with guidelines.
Project	50 points	Project data collection
	150 points	Project Presentation, peer-reviewed
	100 points	Project Report
Total	800 Points	

Table 3 Grade Scale

90%- 100%	A	> 720 points
80%- 90%	B	> 640 Points
70%- 80%	C	> 560 Points
60%- 70%	D	> 480 Points
0%- 60%	F	< 480 Points

This course does not have exams. It requires a final project. The project is a **individual project**. Decide the presentation topics and study area on your own. The project will include:

Project data collection: Use any software or tools you learned from this course to collect your project data.
Project presentation: Your will give a 15-minute (2-3 minutes for Q&A) presentation of your project to the class
Project report: A final report with at least 5 pages without references, and with a 12 font of Time New Roman and line spacing 1.5 lines.

The project report will be graded by the following criteria:

Table 4 Criteria

Structure	**Contents**
Title (& your affiliation)	Describe interestingly and succinctly the contents of the paper
Introduction	State motivation and objectives of the study. Include literature reviews if possible.
Study area	Describe your study area
Data & Methods	Describe how do you collect your data and how do you visualize and analysis your data
Results	Explain the major findings from the data analysis
Conclusions	Summarize major content and draw common themes
Reference	List cited papers/web sources/textbooks by the reference format in the sample paper*

Attendance Policy

1. Attendance is mandatory
2. Class will begin promptly, so please show up on time. ***If you are more than 20 minutes late for an exam or final presentation, it will not be completed, and you will receive a grade of zero on the examination.***
3. ***Consistent with University of Central Arkansas guidelines, excessive absences (up to 3 times) may jeopardize students' grades and the instructor reserves the right to remove you from the class permanently.***

Feedback Response Time

The instructor generally replies to email within 48 hours, except during holidays. Often the instructor replies much more quickly, but you should not count on a same-day reply. Please plan accordingly so that you don't miss deadlines.

Classroom Etiquette

1. Switch cell phones off and place them out of view. Do not use phones during class. Resist the impulse!
2. Computers are permitted for note-taking only.
3. Do not sleep in class or leave once a lecture has started
4. Do not pack up and prepare to leave until the instructor has indicated that class is over
5. No eCigarettes permitted in the classroom.
6. You are encouraged to think critically and ask stimulating questions, but always respect your fellow students and your instructor.

COVID-19 adaptation

According to the guidance of the University of Central Arkansas responding to COVID-19, this class in the Fall will be an in-person format. The class schedule has followed this guidance. However, the schedule maybe changed, and we will transfer to virtual format if face-to-face delivery is interrupted. All students are expected to know and comply with university policy related to Covid-19. For information and resources, see https://uca.edu/coronavirus/.

Please stay healthy. If you feel any symptoms of COVID-19 (e.g., fever of 100.4 degree last two days, a cough, difficulty breathing, a sore throat), please contact your healthcare provider or the Student Health Clinic (https://uca.edu/studenthealth/).

Academic Integrity Statement

The University of Central Arkansas affirms its commitment to academic integrity and expects all members of the university community to accept shared responsibility for maintaining academic integrity. Students in this course are subject to the provisions of the university's Academic Integrity Policy, approved by the Board of Trustees as Board Policy No. 709 on February 10, 2010, and published in the *Student Handbook*. Penalties for academic misconduct in this course may include a failing grade on an assignment, a failing grade in the course, or any other course-related sanction the instructor determines to be appropriate. Continued enrollment in this course affirms a student's acceptance of this university policy.

Accommodations

The University of Central Arkansas adheres to the requirements of the Americans with Disabilities Act. If you need an accommodation under this Act due to a disability, please contact the Office of Accessibility Resources and Services (OARS), 450-3613.

Building Emergency Plan statement

An Emergency Procedures Summary (EPS) for the building in which this class is held will be discussed during the first week of this course. EPS documents for most buildings on campus are available at http://uca.edu/mysafety/bep/. Every student should be familiar with emergency procedures for any campus building in which he/she spends time for classes or other purposes.

Diversity Statement

The University of Central Arkansas is dedicated to attracting and supporting a diverse student, faculty, and staff population and enhanced multicultural learning opportunities. We value the opportunity to work, learn, and develop in a community that embraces the diversity of individuals and ideas, including race, ethnicity, religion, spiritual beliefs, national origin, age, gender, marital

status, socioeconomic background, sexual orientation, physical ability, political affiliation, and intellectual perspective (https://uca.edu/diversity/institutional-diversity/).

Title IX disclosure

In furtherance of its core values— academic vitality, integrity, and diversity—UCA is dedicated to promoting a campus community free from discrimination. Title IX of the Education Amendments Act of 1972 requires all educational institutions to address gender-based discrimination on campus, and UCA implements these Federal requirements through a fair, consistent, and appropriate process of investigation and adjudication. Please see UCA's Title IX website (https://uca.edu/titleix/) for the university's policy, relevant forms, training opportunities, and related information.

Evaluations

Student evaluations of a course and its professor are a crucial element in helping faculty achieve excellence in the classroom and the institution in demonstrating that students are gaining knowledge. **Students will receive notification about evaluations from the university.**

*The instructor reserves the right to amend the syllabus, including assignments, schedules, and policies, at any time during the semester as deemed necessary.