UNIVERSITY OF CENTRAL ARKANSAS™ | Geography

Geography (GEOG) 3403: Geographic Information Systems II
Spring 2026
Lecture Time: TR: 9:25 am- 10:40 pm
Lab Time: R: 10:50 am- 12:05 pm
Location: Lecture: Burdick Hall 315; Lab: Burdick Hall 315

Instructor: Yanan Wu, PhD
Office: Burdick 318B
E-mail: ywu@uca.edu
Office Hours: MW 10:00- 11:45 am

Course Description

This course builds upon the foundation GIS knowledge and skills acquired in GIS I and guides students in the development of increasingly sophisticated spatial analysis capacity. This course is designed to provide introductions to visualization, surface analysis, spatial statistics, and building models. The theory includes detail of the concepts and principles that underpin the spatial modeling and analysis techniques employed in the practical exercises.

Course Outcomes

After completing this course, a student will be able to:

1. explain concepts and principles of various spatial analysis methods
2. work with a variety of raster datasets
3. perform sophisticated raster and vector analysis
4. perform network, terrain, hydrological, GWR, land cover and land use change analyses, and time-series
5. conduct and interpret spatial statistical results
6. produce spatial models using ArcGIS Model Builder
7. use the ArcGIS software package with a variety of data and methods to address a question with a spatial component

Course Framework

This course will use a combination of lectures, demonstrations, and lab exercises. The instructor firmly believes that students learn via engagement and doing. As a result, large portions of the class time will be set for demonstrations and lab exercises. 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. *GIS Fundamentals* by Paul Bolstad (ISBN-10: 978-0971764736; ISBN-13: 0971764735)
2. *Discovering GIS and ArcGIS Pro* by Bradley A. Shellito (ISBN-10: 131923075X; ISBN-13: 978-1319230753)
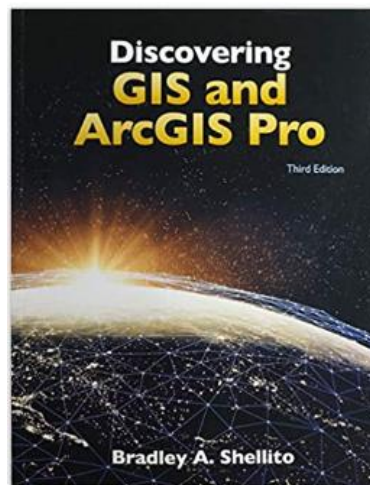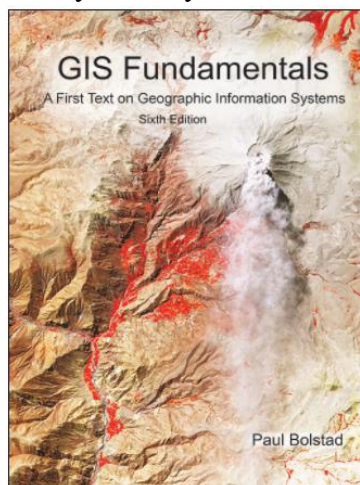
Required software
1: ArcGIS Pro 3.0/3.1, provided by Geography department

Course schedule
A tentative schedule. Ch is from Dr.Bolstad and Ch is from Dr. Shellito

Week	Date	Meeting	Tuesday	Thursday	Source Material
W1	Jan 8- 9	Lecture		Introductions, Syllabus, ArcGIS Online Accounts, ArcGIS Pro	Ch 1
		Lab		No Lab	

W2	**Jan 12 - 16**	Lecture	Syllabus Network Analysis	Network Analysis	Ch 9, Ch11
		Lab		Lab 1 Network Analysis	
W3	**Jan 19- 23**	Lecture	Digital Terrain and Hydrological Analysis	Digital Terrain and Hydrological Analysis	Ch 11, Ch15 & 22
		Lab		Lab 2: Digital Terrain & Hydrological Analysis	
W4	**Jan 26- 30**	Lecture	Remote Sensing Imagery	Remote Sensing Imagery	Ch 6, Ch 13
		Lab		Lab 3 Remote Sensing of Classification	
W5	**Feb 2- 6**	Lecture	Remote Sensing Imagery	Remote Sensing Imagery	Ch 6, Ch 13
		Lab		Lab 4 Land Cover and Land Use Change	
W6	**Feb 9- 13**	Lecture	Lidar and 3D Visualization	Lidar and 3D Visualization	Ch 17,18
		Lab		Lab 5 Lidar Data Analysis & 3D Visualization	
W7	**Feb 16- 20**	Lecture	Spatial Statistics	Spatial Statistics **Quiz #1**	Ch 12
		Lab		Lab 6 Spatial Pattern Analysis	
W8	**Feb 23- 27**	Lecture	Geographically Weighted Regression	Geographically Weighted Regression	*TBD*
		Lab		Lab 7 GWR model	
W9	**Mar 2- 6**	Lecture	Spatial Interpolation	Spatial Interpolation	Ch 12, Ch 14
		Lab		Lab 8 Spatial Interpolation	
W10	**Mar 9- 13**	Lecture	**Project Discussion**	**Project Discussion**	

		Lab	**No Lab**		
W11	**Mar 16- 20**	Lecture	**AAG Conference**		
		Lab	**No Lab**		
W12	**Mar23- 27**	Lecture	**Spring Break**		
		Lab	**No Lab**		
W13	**March 30- Apr 3**	Lecture	Time Series Analysis	Time Series Analysis	
		Lab		Lab 9 Time Series Analysis	
W 14	**Apr 6 - 10**	Lecture	Spatial Modeling	Spatial Modeling **Quiz #2**	
		Lab		Lab 10 Spatial Modeling	
W15	**Apr 13 - 17**	Lecture	**Project Analysis**	**Project Analysis**	
		Lab	**No Lab**		
W16	**Apr 20 - 24**		**Project Presentation**	**Project Presentation**	
W17	**Apr 27 – May 1**		**Project Report**	**Project Report**	

Grading

Grading for this course will consist of 10 labs, two quizzes, and one project. The details showed in Table 1 and Table 2.

It is important that all lab exercises be completed in a timely manner. Some bonus exercises may be provided. ***Labs 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 1 Grade distribution

Item	Points	Description
Lab exercises	50 points each, 500 points in total	10 lab exercises. Each will be provided with guidelines.
Quiz	50 points each, 100 points in total	Quiz will consist of multiple choice and true/false.
Project	50 points	Project topic
	50 points	Project Outline
	50 points	Project Data
	150 points	Project Presentation, Peer-reviewed
	100 points	Project Report
Total	1000 Points	

Table 2 Grade Scale

90%- 100%	A	> 900 points
80%- 90%	B	> 800 Points
70%- 80%	C	> 700 Points
60%- 70%	D	> 600 Points
0%- 60%	F	< 600 Points

This course requires a final project. The project is an **individual project**. *Students are responsible to determine the project topic and study area.* The project will include:

Project topic: A tentative title of the project should be submitted by the due date posted
Project outline: A tentative project outline to describe the project objectives
Project data: A tentative description of data that will be used in the project
Project presentation: Each student 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 Times New Roman and line spacing of 1.5 lines.

The project report will be graded by the following criteria:

Table 3. 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 you collect your data and how you visualize and analyze 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 10 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 emails 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 notetaking 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 response to COVID-19, this class will be in an in-person format. The class schedule has followed this guidance. However, the schedule may be changed, and we will transfer to a virtual format if face-to-face delivery is interrupted. All students are expected to know and comply with university policies 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., a fever of 100.4 degrees last two days, a cough, difficulty breathing, or 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 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 enhancing 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 may evaluate courses they are taking starting on Monday, April 8, 2024, through Sunday, May 5, 2024, by logging in to myUCA and clicking on the Course Evaluations task.**