

**Course** Geography (GEOG) 2475: Geographic Information Systems I

**Lecture:** TR 10:50 am - 12:05 pm

**Lab:** TR 12: 15 pm – 1: 30 pm

**Location:** Lewis Science Center 174

# Instructor

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Office Hours: TR 10:00- 11:50 am

# Course Contributions

Several people helped me to develop this course by providing advice, data, or materials. Specifically, I would like to acknowledge the contributions of Dr. Fang Fang from UIUC, Dr. Aaron Maxwell from WVU, and staff from the National Geospatial Technology Center of Excellence.

# Course Description

GIS is a computer-based system to aid in the collection, maintenance, storage, analysis, output, and distribution of spatial data and information. This course is designed to provide introductions to concepts, principles, and practices of acquiring, storing, analyzing, displaying, and use of geographic information. This course also explores the science behind GIS and software, techniques, and methods that are necessary to manipulate geographic data and produce good maps.

# Course Outcomes

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

1. explain GIS principles and concepts
2. acquire the knowledge of how computers store spatial data using vector and raster data structures
3. find geospatial data using the web
4. apply cartographic principles to symbolize and classify geographic data
5. produce audience-oriented maps using spatial data
6. build a geodatabase and query attribute table
7. geocode address
8. conduct basic spatial analyses
9. gain experience in GIS software (ESRI ArcGIS)

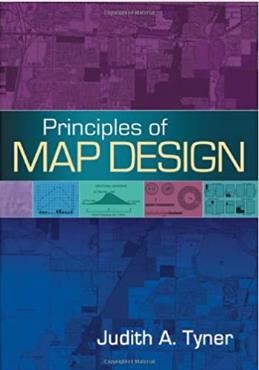
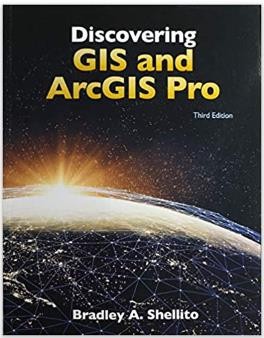
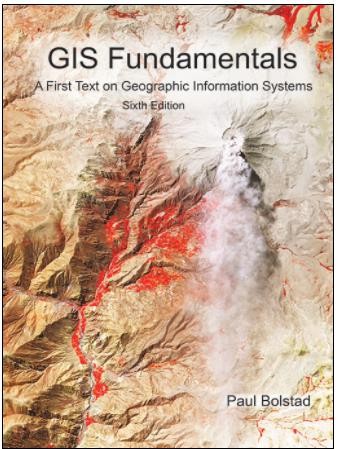
# Course Framework

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)
3. *Principles of Map Design* by Judith A. Tyner. (ISBN 978-1-60623-544-7, 978-1-4625-1712- 1)



# Required software

1: ArcGIS Pro 3.0, provided by the Geography department

2: Inkscape is free to download (https://inkscape.org/)

# Course Schedule

Ch is from Dr.Bolstad, *Ch is from Dr. Tyner*, and Ch is from Dr. Shellito

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Week** | **Date** | **Meeting** | **Tuesday** | **Thursday** | **Source Material** |
| **W1** | **Aug. 21-22** | Lecture | **Summer Break** | Introductions to Syllabus | Ch 1 |
| Lab | **Summer Break** | Q&A for lecture and lab |  |
| **W2** | **Aug. 25-29** | Lecture | ArcGIS Online Accounts | ArcGIS Pro | Ch 1/3, Ch 1 |
| Lab | Lab #1: ArcGIS Online Accounts | Lab #1: ArcGIS Pro |  |
| **W3** | **Sep. 1-5** | Lecture | Datums and Projections | Datums and Projections | Ch 3 |
| Lab | Lab #2: Datums and Projections | Lab #2: Datums and Projections |  |
| **W4** | **Sep. 8-12** | Lecture | Geospatial Data | Geospatial Data | Ch 3/2, Ch 1/12 |
| Lab | Lab #3: Exploring Spatial Data | Lab #3: Exploring Spatial Data |  |
| **W5** | **Sep. 15-19** | Lecture | Attribute Tables and Geodatabases | Attribute Tables and Geodatabases | Ch 8, Ch 2 |
| Lab | Lab #4: Queries | Lab #4: Queries |  |
| **W6** | **Sep. 22-26** | Lecture | Cartography I:  Data Standardization  Classification | Cartography II:  Symbolization | *Ch 7/8,* Ch 3 |
| Lab | Lab #5: Standardized Map | Lab #5: Standardized Map |  |
| **W7** | **Sep 29-Oct. 3** | Lecture | Cartography III: Map Elements | Cartography III: Map Elements | *Ch 2,* Ch 3 |
| Lab | Lab #6: Dot Density Map | Lab #6: Dot Density Map |  |
| **W8** | **Oct. 6-10** | Lecture | Cartography IV:  Color and Typography | Cartography IV:  Color and Typography | *Ch 3/4*, Ch 3 |
| Lab | Lab #7: Inset Map | Lab #7: Inset Map |  |
| **W9** | **Oct. 13-17** | Lecture | ***Mid Exam*** | ***Arkansas GIS User Forum: no class*** |  |
| Lab | ***No Lab*** | ***No Lab*** |  |
| **W10** | **Oct. 20-24** | Lecture | Digitizing, Georeferencing, Resampling | ***Fall Break: No class*** | Ch 4, Ch 6/7 |
| Lab | Lab #8: Digitizing | ***Fall Break: No class*** |  |
| **W11** | **Oct. 27-31** | Lecture | Data Accuracy and Precision | Data Accuracy and Precision Vector Analysis | Ch 14/9,  Ch 8 |
| Lab | Lab #9: Georeferencing and Resampling | Lab #9: Georeferencing and Resampling |  |
| **W12** | **Nov. 3-7** | Lecture | Vector Analysis | Geocoding | Ch 9/10,  Ch 8/10 |
| Lab | Lab #10: Vector Analysis | Lab #10: Vector Analysis |  |
| **W13** | **Nov. 10-14** | Lecture | Raster Analysis | Raster Analysis | Ch 10/7, Ch 12 |
| Lab | Lab #12: Raster Analysis | Lab #12: Raster Analysis |  |
| **W14** | **Nov. 17-21** |  | Finding GIS Data | Project Analysis/Catch-up Session | Ch 7 |
| **W15** | **Nov. 24-28** |  | ***Thanksgiving Break*** | |  |
| **W16** | **Dec. 1-5** |  | ***Catch-up Section*** | |  |
| **W17** | **Dec. 8-12** |  | **Final Exam (11:00- 1:00 pm)** |  |  |

# Grading

This course includes 4-credit and 3-credit versions. For the 4-credit version, grading will consist of 12 labs, one project, and two exams. The details are shown in Table 1 and Table 2. For the 3- credit version, grading will consist of 12 labs and two exams. The details are shown in Table 3 and Table 4.

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.

Exams will focus on the key concepts and methods discussed in the lecture. The goal of exams will be for you to demonstrate an understanding of the key concepts discussed in class. Being able to execute an analysis is of little benefit if you do not understand the underlying concepts. The exams are not cumulative. *Make-up exams for absences due to any other reason will be at the discretion of the instructor. You must notify the instructor beforehand if you need to miss an exam, the instructor will not let you make up an exam without prior notification. However, the final exam cannot be rescheduled. You are expected to take the final at the time specified.*

**Table 1 Grade distribution for 4-credit version**

|  |  |  |
| --- | --- | --- |
| **Item** | **Points** | **Description** |
| Lab exercises | 50 points each, 600 points in total | 12 lab exercises. Each will be provided with guidelines. In each lab, there are ~10-30 questions to answer. |
| Project | 100 points | 1: Project Data (30 points)   1. Include spatial data (15 points) 2. Include non-spatial data (15 points) 2: Project report (70 points) 3. Objective (10 points) 4. Project map (40 points) 5. Interpretation of the map (20 points) Detailed requirements will be provided. |
| Midterm Exam | 100 points | Exam will consist of multiple choice, true/false, and short answers. |
| Final Exam | 100 points | Exam will consist of multiple choice, true/false, and short answers. |
| Total | 900 Points |  |

**Table 2 Grade Scale for 4-credit version**

|  |  |  |
| --- | --- | --- |
| 90%- 100% | A | > 810 points |
| 80%- 90% | B | > 720 Points |
| 70%- 80% | C | > 630 Points |
| 60%- 70% | D | > 540 Points |
| 0%- 60% | F | < 540 Points |

**Table 3 Grade distribution for 3-credit version**

|  |  |  |
| --- | --- | --- |
| **Item** | **Points** | **Description** |
| Lab exercises | 50 points each, 600 points in total | 12 lab exercises. Each will be provided with guidelines. In each lab, there are ~10-30 questions to answer. |
| Midterm Exam | 100 points | Exam will consist of multiple choice, true/false, and short answers. |
| Final Exam | 100 points | Exam will consist of multiple choice, true/false, and short answers. |
| Total | 800 Points |  |

**Table 4 Grade Scale for 3-credit version**

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

**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, 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 in the Fall 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), 501-450-3613.

# 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 may evaluate courses they are taking starting on Monday, Nov 20 2023, through Sunday, Dec 17 2023 by logging in to myUCA and clicking on the Course Evaluations task.**