

University of Arkansas - Fort Smith

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General Syllabus

GEOS 11003 - Introduction to Geographic Information Systems

Credit Hours: 3

Lecture Hours: 2

Lab Hours: 2

Effective Catalog: 2021-2022

I. Course Information

A. Catalog Description

Basic knowledge of Geographic Information Systems (GIS) to include GIS applications, fundamentals of GIS capabilities, electronic cartography, database development, and management perspectives for GIS.

B. Additional Information

GIS (Geographic Information Systems) is a computer-based tool that uses spatial (geographic) data to analyze and solve real-world problems. This course is designed to introduce the student to the basic principles and techniques of GIS. The lab material will emphasize GIS data collection, entry, storage, analysis, and output using GIS applications.

II. Student Learning Outcomes

A. Subject Matter

Upon successful completion of this course, the student will be able to:

1. Define and describe the purpose of GIS and project analysis.
2. Articulate the importance of scale, projections, and coordinate systems.
3. Discuss and describe hardware and software components of GIS.
4. Describe vector and raster data structures and the appropriate use of each.
5. Describe and evaluate methods of data capture and sources for data.
6. Demonstrate the basics of data capture, storage, analysis, and output in a GIS.
7. Design and develop maps and digital products with GIS.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills

Critical Thinking: Students will identify problems/issues when conducting GIS analysis and develop solutions. Students will research, evaluate, and compare information from varying sources in order to evaluate authority, accuracy, and relevance to the analysis conducted.

Quantitative Reasoning: Students will apply mathematical and scientific reasoning when reading and analyzing models for GIS analysis.

Communication Skills (written and oral)

Students will communicate proficiently and compose coherent professional GIS map documents appropriate to the intended audience.

Global & Cultural Perspectives

Students will reflect upon cultural differences and their implications for interacting with people from cultures other than their own when developing GIS analysis and map projects.

III. Major Course Topics

- A. Concepts and terminology associated with GIS
- B. Vector-based and raster-based GIS
- C. Data acquisition and input, graphic output design, and GIS map presentation of data analysis
- D. Fundamental elements of geodatabases
- E. Analytical functions on GIS data
- F. Utilization of GIS and web applications
- G. Map views and digital products with GIS
- H. Various GIS technologies used in industry