

University of Arkansas - Fort Smith
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General Syllabus

GEOS 35503 GIS Spatial Analysis

Credit Hours: 3

Lecture Hours: 2

Laboratory Hours: 2

Prerequisite: GEOS 11003 Introduction to Geographic Information Systems

Prerequisite or corequisite: GEOS 32104 Principles of Remote Sensing

Effective [Catalog](#): 2026 - 2027

I. Course Information

A. Catalog Description

Explores GIS analysis and presentation using remotely sensed data, covering the electromagnetic spectrum and data interpretation. This course also focuses on 3D spatial analysis and practical applications of ArcGIS tools for tasks like map design, geodatabases, and spatial analysis, including basic statistics and 3D applications.

B. Additional Information

This course is a core requirement for the B.S. degree in Geoscience

II. Student Learning Outcomes

A. Subject Matter

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

1. Use concepts and terminology associated with remote sensing.
2. Illustrate appropriate uses of various analysis technology.
3. Prepare data associated with remote sensing concerning raster and 3D spatial acquisition.
4. Use the analytical functions of ArcGIS and digital image processing.
5. Design and develop maps and digital products resulting from image analysis techniques.
6. Examine three-dimensional visualization of GIS data for data exploration and synthesis.
7. Create and analyze surface data for sophisticated modeling, viewing, and analysis.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills

Quantitative Reasoning - The student will develop spatial analysis and georeferencing to apply appropriate solutions to outcomes.

Global and Cultural Perspectives

Students will demonstrate how their discipline impacts or is impacted by different global perspectives when creating and presenting data and information.

III. Major Course Topics

- A. History of aerial photography and aerial platforms
- B. Visual image interpretation and Photogrammetry
- C. Multispectral and Thermal infrared remote sensing
- D. Active & passive microwave remote sensing
- E. LiDAR remote sensing data
- F. Remote sensing of soils, vegetation, water, and urban landscape
- G. Remote sensing of soils, minerals & geomorphology
- H. Spectral reflectance measurement
- I. Creation and analysis of three-dimensional views and data