University of Arkansas - Fort Smith
5210 Grand Avenue
P. O. Box 3649
Fort Smith, AR 72913-3649
479-788-7000

General Syllabus

GEOS 20103 GIS Analysis

Credit Hours: 3 Lecture Hours: 2 Lab Hours: 2

Prerequisite(s): GEOS 11003 Introduction to Geographic Information Systems
Prerequisite(s) or Corequisite(s): MATH 11103 College Math and Quantitative Literacy or MATH 11003 College Algebra

Effective Catalog: 2021-2022

I. Course Information

A. Catalog Description

Introduces problem-solving aspects of GIS through data and spatial analysis. Concepts developed include map outputs for GIS projects, fundamentals of raster and 3D data, working with spatial data and analysis, and creating real-world applications. Provides hands-on experience with various GIS analysis techniques.

B. Additional Information

Extends student's knowledge and skills in the area of GIS Analysis to address issues of relevance to local communities, the nation and the world. This course will provide a theoretical foundation upon which more advanced concepts can be learned using applied skills for spatial analysis.

II. Student Learning Outcomes

A. Subject Matter

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

1. Discuss the concepts and define terminology associated with advanced GIS analysis.
2. Analyze datasets using the appropriate types of tools and technology.
3. Demonstrate the use of data preparation for spatial analysis.
4. Examine elements of spatial databases for projections and mapping.
5. Determine appropriate 3D data for use in the creation of 3D maps.
6. Assemble and prepare geoprocessing tools to develop analysis for real-world data.

7. Construct maps and online digital products for presentation.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills

Critical Thinking - Students will identify problems/issues and develop solutions for GIS analysis.

Quantitative Reasoning - The student will develop spatial analysis and geo-referencing to apply appropriate solutions to spatial measurements and geostatistics.

Global & Cultural Perspectives

Students will reflect upon cultural differences and their implications concerning GIS analysis with people from cultures other than their own.

III. Major Course Topics

A. Online GIS applications for publishing data and maps
B. Elements of map design and advanced labeling of features
C. Creation of custom scales, density maps and quantitative attributes
D. Map outputs for GIS projects and building story maps
E. Data importing and modification for geodatabases
F. Introduction to Python expressions and SQL query criteria
G. Spatial data projections, vector data formats and geoprocessing
H. Feature digitization and working with CAD drawings
I. Buffers and cluster analysis for spatial data
J. Hillshades and kernel density for raster GIS
K. 3D GIS including Z-enabled features and TIN surfaces
L. Fundamentals of Operations Management involving Graffiti Mapping and Removal Systems