NorthWest Arkansas Community College
Division of Science & Mathematics

GEOS 2943 Introduction to Geographic Information Systems I

Catalog Description: Introduction to Geographical Information Science I: Introduces students to the basic spatial data manipulation skill set necessary for utilizing GIS in the workplace. Topics of study will come from fields such as environmental and regulatory, landscape design, land use planning, and mapping. Class time will divided into lecture, computer lab, and field work.

Prerequisites: None, but the instructor will assume you possess the following computer skills:

- Turning the computer on and logging in as a user
- Proficiency with a mouse, including left, right, and double-click.
- Navigating the file system to find folders, applications, and files
- Launching applications and opening files
- Opening, closing, moving, and resizing windows
- Using tools, buttons, menus, and dialog boxes

Credit hours/Load hours/Contact hours: 3/4/4

Target Audience/Transferability: This course is designed as an introduction to Geographic Information Sciences for students who wish to improve their technical skill set to enhance employability in the marketplace. Students who have had little to no exposure to GIS will feel comfortable with the content and demands of the course. In addition, *Intro to GIS* is part of the updated curriculum for the Environmental Management option in the Environmental and Regulatory Science A.A.S. degree program. Students should check with their transfer institutions to confirm how this course would be counted as part of their specific degree plan.

Student Learning Outcomes: Students completing this course will:

- Explain basic GIS terminology such as raster, vector, layer, shapefiles, etc.
- Import, store, and manage geographical data from a variety of sources.
- Organize layers, including such tasks as layer activation, hierarchy, and manipulation of layer display properties to optimize visual effect.
- Find and query spatial data by location and non-spatial data by attribute.
- Create and analyze new data by creating spatial relationships between multiple datasets.
- Display results in a variety of formats, including map, report, and graph.
- Utilize skills to create a GIS product for analysis of local problems, as a final group project.

Required Text:

Mastering ArcGIS 3rd ed., Price, McGraw-Hill, 2008

Topics:

- Map projections and coordinate systems.
- Raster and vector data and the essential differences between the two.
- Symbolizing and classifying features for optimum map display and analysis.
- Creating subsets from the database through attribute and location queries.
- Building geodatabases via creation and organization of shapefiles and feature classes.
- Generating new data sets through combining existing data layers (geoprocessing).
- Digitizing and editing new map features and their attributes.
- Producing quality presentation maps from templates and other resources.
- Geocoding addresses.

Required Methods of Instruction: Lecture on essential GIS concepts

The bulk of student learning will be in the computer laboratory via step-by-step exercises from the textbook. Laboratory will consist of first-time GIS users learning how to perform rudimentary tasks in data manipulation, analysis, and interpretation through hands-on exercises from the manual. This will involve 1) manipulation of spatial data such as map layers and their attributes, and, 2) manipulation, through querying, buffering, and other tools, of non-spatial attributes, such as population statistics, which are linked to the spatial map data. Students should expect to spend a certain amount of time working on projects in the open computer labs.

Assignments:

Students are required to complete a community GIS project as a component of the course. Requirements of the project include:

- Students will work in groups of 3-4
- Students will acquire and manipulate available metadata.
- Manipulated data will be presented in a map format suitable for printing
- Final oral presentation summarizing results of the study

Forms of Assessment:

- Final project in addition to exams and homework.