ArcGIS Desktop III: GIS Workflows and Analysis

Overview

This 2-day course builds on the skills and knowledge taught in ArcGIS Desktop II: Tools and Functionality. The focus is on working with data stored in a geodatabase and performing geoprocessing and analysis. While doing hands-on exercises, students will organize and edit data stored in a geodatabase, prepare data for analysis, create and edit geoprocessing models using ModelBuilder, and work through a challenging analysis project.

Audience

This course is for experienced ArcGIS users who want to learn more about the ArcGIS tools for creating and editing data, as well as GIS analysis.

Goals

Students completing this course will be able to:

- Add data from different sources to a geodatabase.
- Work with subtypes to edit data.
- Edit and validate feature geometry and attributes using geodatabase topology.
- Run analysis tools using dialog boxes and models.
- Build a complex model using ModelBuilder.

Topics

- **Getting data into the geodatabase**: Advantages of migrating data to the geodatabase; File and personal geodatabases; Loading and importing data; Data sources available for conversion; ArcToolbox conversion tools; Importing and exporting data in ArcCatalog; Importing and exporting data using XML; Copying and pasting data between geodatabases; Batch and single conversions; Loading data into existing feature classes using the Simple Data Loader; Displaying x,y coordinate data from a table; Accessing tabular data using an OLE DB connection; Adding data from a GIS server; Working with map projections and datums.

- **Geodatabase behavior**: What is behavior?; Advantages of using behaviors; Default values; Subtypes; Domains; Geodatabase topology.

- **Editing GIS data**: Creating new data (digitizing, copying and pasting features, Editor menu commands); Constructing an edit sketch using constraints (direction, length, parallel); Creating adjacent polygons using the Auto-Complete Polygon task; Modifying existing features; Reshaping existing features and boundaries; Exploding multipart features; Editing using domains, subtypes, and topology.

- **Aligning spatial data**: Common data alignment problems; Georeferencing CAD data; Matching layer boundaries; Transformation; Rubber sheeting; RMS error.

- **Managing geoprocessing tools and settings**: Types of toolboxes and how they are stored; Types of tools (system tools, models, scripts); Locating tools in ArcToolbox; Executing tools; Tool parameters; Parameter error detection; Environment settings; Tool layers; Geoprocessing results.

- **Analyzing GIS data**: Review of common analysis tools (Buffer, Clip, Intersect, Select, Union); Working with feature proximity tools (Near, Spatial Join, Multiple Ring Buffer, Create Thiessen Polygons); Analyzing tabular data; Creating a raster subset; Analysis options outside of core ArcGIS Desktop; Typical analysis workflow.

- **Using ModelBuilder for analysis**: Working with ModelBuilder; Creating and designing models; Model elements (tools and variables); Setting general model properties; Setting model parameters; Environment settings; Intermediate data; Running and troubleshooting a model; Creating model documentation.

- **GIS analysis projects**: Real-world GIS analysis projects (Find the best site for a new shelter, Find the mileage of flooded roads); The analytical process for each project.
Prerequisites and recommendations

Students should have completed one of the following or have equivalent knowledge: *Introduction to ArcGIS I, ArcGIS Desktop II: Tools and Functionality,* or *Learning ArcGIS Desktop.*

Location

The Center for Geographic Information Science, located within the Brewster Building at East Carolina University, provides an organizational structure and a central facility for the purposes of enhancing research, instructional, and outreach activities that deal with creation and use of geographically referenced data. The Center is dedicated to serving ECU faculty and students and off-campus constituents. The Center provides educational opportunities that reflect the community’s GIScience needs. This course will be taught in Brewster Building, C-Wing, room 201.

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