

# **ArcGIS<sup>®</sup> Desktop I: Getting Started with GIS**

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## Introduction

- Introduction
- Course goals
- Using the course workbook
- Additional resources
- Installing the course data

## 1 The big picture of GIS

- Lesson introduction
- Explore the meaning of GIS
- GIS functions
- Lesson review
  - Answers to Lesson 1 questions

## 2 GIS maps

- Lesson introduction
- Layers have...
- Features and layers
- Map scale
- Exercise 2A: Explore GIS map basics
  - Start ArcMap and open a blank map document
  - Connect to a folder
  - Open an existing map document
  - Reorder layers in the table of contents
  - Turn layers on and off
  - Symbolize a layer
  - Explore scale
  - Identify features
  - Find features
  - Determine feature location
  - Save the map document
- Exercise 2B: Practice using GIS maps
  - Open a map document
  - Use the Identify tool to answer questions
  - Use the Hyperlink tool to determine country name
  - Navigate to a new location
  - Use the Find tool to search countries
  - Identify one layer at a time
  - Use Zoom and Pan tools
  - Navigate your way home
  - Save your map document
  - (Optional) Challenge
- Lesson review
  - Answers to Lesson 2 questions

### 3 GIS power: The data behind the map

- Lesson introduction
- Layer attribute table
- Categorical and quantitative data
- Identify the correct data type
- Exercise 3A: Explore the feature-attribute relationship
  - Start ArcMap and open a map document
  - Explore map features and the attribute table
  - Enable MapTips
  - Symbolize Peaks features based on elevation
  - Label Peaks features with peak names
- Exercise 3B: Explore benefits of the feature-attribute relationship
  - Open a map document
  - Rename a data frame
  - Add and symbolize data
  - Label features
  - Insert and rename a data frame
  - Add data to the data frame
  - Symbolize the Cabins layer
  - Label the Campgrounds layer
  - Enable MapTips
- Lesson review
  - Answers to Lesson 3 questions

### 4 Creating a map layout

- Lesson introduction
- Map content considerations
- Thinking about map content
- Data view and layout view
- Exercise 4A: Create a map layout
  - Start ArcMap and open a map document
  - Work with Hawaii and Alaska data frames
  - Compare data view and layout view
  - Work with bookmarks
  - Apply a template to the map layout
  - Edit a map element
  - Save and export the map layout
- Exercise 4B: Make a map layout in reverse
  - Open a map document
  - Save your map
  - Symbolize layers
  - Label features
  - Set page properties
  - Switch to layout view
  - Add map elements
  - Save and export a map layout

Lesson review  
Answers to Lesson 4 questions

## 5 Pinning down geographic data

Lesson introduction  
What is a coordinate system?  
Cartesian coordinate system  
Spatial reference lines  
Location system: Latitude-longitude  
Measuring latitude and longitude  
Flattening the earth with map projections  
Map projections and distortion  
Platt Carrée  
Robinson  
Mercator  
Polar stereographic  
Exercise 5A: Use coordinate to find places  
    Start ArcMap and open a map document  
    Identify the coordinates of a city  
    Identify the coordinates of another city  
    Change the display of coordinates  
    Find cities by their coordinates  
    Use the Go To XY tool to find cities by coordinates  
    Find the coordinates of your city  
Exercise 5B: Make measurements on maps  
    Open a map document  
    Measure area in the Mercator projection  
    Measure distance in the Mercator projection  
    Measure area and distance in the Mollweide projection  
    Measure area and distance in the Winkel Tripel projection  
    Compare the measurements  
Lesson review  
Answers to Lesson 5 questions

## 6 Geography meets geometry

Lesson introduction  
Vector data: A shape-based view  
Raster data: A cell-based view  
Vector or raster?  
The geodatabase  
Exercise 6: Use vector and raster data in ArcMap  
    Start ArcMap and open a map document  
    Add an elevation raster  
    Symbolize the Study Area Elevation raster  
    Identify elevation values  
    Zoom in to see the raster cell structure  
    Add an aerial photo raster

Identify elevation at backcountry campsites  
Lesson review  
Answers to Lesson 6 questions

## 7 Geographic data: A bird's-eye view

Lesson introduction  
Where does geographic data come from?  
Using tabular data  
Item Description  
Exercise 7: Work with Item Description  
Start ArcMap and open a map document  
Index your data  
View thumbnail graphics of feature classes  
Search Item Descriptions to find data  
Rename and symbolize a new layer  
Explore the South America data  
Find a more detailed feature class  
Examine the new layer of countries  
Change layer symbology  
Edit Item Description and re-index  
Optional: Search for data online  
Lesson review  
Answers to Lesson 7 questions

## 8 Querying data: Asking questions, getting answers

Lesson introduction  
Practice querying attributes  
Practice using location queries  
Exercise 8: Query data based on attributes and locations  
Open a map document  
Find counties based on population  
Refine your selection by age  
Find cities within selected countries  
Find cities near colleges and universities  
Create a layer from selected features  
Save your map and close ArcMap  
Lesson review  
Answers to Lesson 8 questions

## 9 Analyzing spatial relationships

Lesson introduction  
What is spatial analysis?  
Buffering features  
Overlaying features  
Exercise 9: Analyze data using Buffer and Overlay  
Open a map document

- Buffer parks and forests
- Clip rivers to the study area
- Buffer the rivers
- Overlay parks and rivers buffers
- Overlay protected and urban areas
- Save your results
- Lesson review
- Answers to Lesson 9 questions

## 10 Solving problems with GIS

- Lesson introduction
- GIS analysis process
- Exercise 10A: Apply the GIS analysis process
  - Ask a question
  - Acquire data
- Exercise 10B: Apply the GIS analysis process
  - Explore geographic data
  - Analyze data using tools
  - Analyze data using query
  - Analyze data by combining queries
  - Act on geographic knowledge
- Lesson review
- Answers to Lesson 10 questions

## Appendixes

- Appendix A: ESRI data license agreement