**GeoData**

**Introduction to ArcGIS 10**

**COURSE OUTLINE**

This course introduces the underlying principles and methods of Geographical Information Systems (GIS). It examines the processes involved in the capture, storage, manipulation, analysis, presentation and output of digital geographical data in a GIS and provides opportunities for the development of practical skills in processing data using an industry standard GIS software package.

The course comprises a series of presentations and computer-based practical sessions using ESRI’s ArcGIS software with example data sets taken from a variety of fields. The three main elements of ArcGIS (ArcMap, ArcCatalog and ArcToolbox/Geoprocessing) are introduced and topics covered include: data management; data visualisation; data quality and analysis; georeferencing; data presentation and reporting.

This course is intended for those who have little or no GIS knowledge or who wish to undertake some formalized training in ArcGIS having been largely self-taught in the past.

**ANTICIPATED COURSE OUTCOMES / ACHIEVEMENTS**

**Aims and objectives**

- To provide delegates with an appreciation of the fundamental concepts of GIS including its strengths and limitations.
- To introduce the core functionality of ESRI’s ArcGIS software package.
- To teach the fundamental skills needed to obtain, import, manipulate, analyse, interpret, manage and output spatial data in order to investigate topics in the delegate’s area of interest.
- To demonstrate real-world uses of GIS.

**Learning outcomes - by the end of the course, delegates will have a knowledge and understanding of:**

- What a GIS is; what spatial data is; raster and vector data models
- The core tasks involved in a GIS analysis e.g. data acquisition and input; data storage and management; data manipulation and analysis; and data presentation and output
- The core functionality of ArcMap, ArcCatalog and the embedded ArcToolbox
- Importing data from various sources, including scanned paper maps
- Handling tables including selections and queries
- Georeferencing raster images
- Creating and editing spatial data
- The steps required to produce paper maps from base data
- Basic geoprocessing tasks e.g. buffering and clipping
# Introduction to ArcGIS

## Day 1

### 1 - Introduction to GIS
- What is GIS?
- What is Spatial Data?
- Types of questions a GIS can answer
- GIS Tasks
- GIS Data Types
- Mapping in Layers
- Coordinate Systems
- GIS Applications

### 2 - Introduction to ArcGIS
- ArcGIS - Some History
- ArcGIS Family
- What is ArcView
- ArcCatalog
- ArcMap
- ArcToolbox
- ArcGIS.com
- GeoDatabases
- Map Documents
- Help!

**Exercise 2 - Getting Started**

### 3 - Using ArcMap
- ArcMap Components
- Navigating around ArcMap
- Spatial Bookmarks
- Data Frame Properties
- Feature Types
- Identifying Features
- Layer Tables
- Layer Properties
- Map Documents

**Exercise 3a - ArcMap Basics**
**Exercise 3b - Handling Spatial Data**

### 4 - Using ArcCatalog
- Overview
- Metadata (and Finding Data)
- Data Management

**Exercise 4 - ArcCatalog Basics**

### 5 - Using Tables
- Table Types
- Creating Tables
- Adding fields and records
- Editing values in a table
- Selecting and sorting table records
- Generating Field Statistics and Table Summaries
- Joining and Relating tables

**Exercise 5a - Using Tables**
**Exercise 5b - Joining Tables**

## Day 2

### 6 - Selections and Queries
- Identifying Features
- Map Tips
- Hyperlinks
- Select Features Interactively
- Selection by Criteria - Query Builder
- Location-based Selections

**Exercise 6 - Selections and Queries**

### 7 - Georeferencing
- What is georeferencing?
- Data types requiring georeferencing
- The georeferencing tool bar
- Aligning rasters using XY coordinates
- Transforming the image
- Rectifying the image

**Exercise 7a & 7b - Georeferencing**

### 8 - Creating and Editing Layers
- Creating new data
- Shapefiles
- Geodatabases
- Editor Toolbar
- Adding Attributes
- Editing Shapefiles
- Snapping

**Exercise 8 - Creating and Editing Layers**

### 9 - Producing Maps
- What is a Map layout?
- Creating a Map layout
- Map Elements
- Graphic Elements
- Modify Map Elements
- Grouping Map Elements
- Using Templates
- Printing the Map

**Exercise 9a & 9b - Creating Layouts**

### 10 - Geoprocessing & Other Tools
- Toolbars
- GeoProcessing
- Spatial Join
- Customisation and Extensions

**Exercise 10a, 10b & 10c - GIS Processing and Analysis**

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