

GEODATABASE DESIGN CONCEPTS

COURSE OUTLINE

OVERVIEW

This two-day course applies object-oriented analysis and design (OOAD) methodologies in modeling the geodatabase. It focuses on identifying the objects stored in the geodatabase and the relationships between them. Participants learn UML and use its notation and diagrams during the modeling process. A review of the geodatabase as well as a discussion of geographic data concepts (projections, coordinates, coding schemes, etc.) is included. This course does not address programming or database administration. Users interested in these topics may enroll in *Advanced ArcObjects Component Development I* and *Introduction to ArcSDE using ArcInfo 8*. This course is an excellent precursor to *Modeling Geodatabases using CASE Tools (for ArcEditor 8 and ArcInfo 8)*.

DURATION

2 Days

TOPICS COVERED

- **Overview of design:** Overview of an OOAD process and GIS considerations
- **Introduction to object-oriented concepts, UML, and COM:** Background information on object-oriented concepts; Introduction to UML; Notes on COM; Reading ArcObjects OMDs
- **Developing use cases:** Identifying system actors and use cases; Writing and formatting use cases; Levels of use cases; Use case scenarios; Developing use case and activity diagrams
- **Building the conceptual model:** Decomposing concepts from use cases; Diagramming concepts using UML class diagram notation; Modeling concepts, concept attributes, and concept associations
- **Designing classes:** Conceptual model to design model; Analyzing classes; Superclasses, subclasses, inheritance, and subtypes; Abstract, concrete, and leaf classes; Diagramming classes and subtypes; Documenting classes; Linking classes to ArcObjects
- **Designing attributes:** Analyzing classes for attributes; Documenting and diagramming attributes; Attribute rules and normalization; ESRI data types and DBMS fields; Documenting and diagramming domains; Domains and subtypes
- **Designing relationships:** Types of associations; Implementing associations; Relationship classes; Modeling relationships; Relationship keys; Degrees of relationships; Relationship properties and cardinality; Attributed relationships; Simple vs. composite relationships; Messaging and relationships; Relationships and subtypes; Modeling relationship rules; Modeling network connectivity rules with relationships; Diagramming relationships
- **Choosing a spatial abstraction:** Projection design considerations; Scale and resolution design considerations; Types of topology; Vector and raster representations; Geodatabase vector geometry model; Network model, edges, and junctions; Annotation
- **Geodatabase considerations:** Object classes, feature classes, and feature datasets; Supporting coincident features; Geodatabase coordinate storage; Computing coordinate precision and domains; ArcSDE vs. personal geodatabase; Managing security; Geodatabase clients
- **Automation plan and pilot project:** Sources of data; Evaluating data sources; Loading coverages and shapefiles; Scanning; Digitizing; Automation management and staffing; Pilot project guidelines; Metadata

OBJECTIVES

Class participants learn how to

- Write and analyze use cases
- Capture system architecture in a UML use case diagram
- Diagram a use case with a UML activity diagram
- Decompose use cases into concepts and associations
- Diagram the conceptual model using a UML class diagram
- Design classes, attributes, and relationships based on the conceptual model
- Diagram the design model using a UML class diagram
- Define an appropriate geodatabase structure for a model
- Build a geodatabase schema using ArcCatalog
- Load data into the geodatabase
- Define an appropriate spatial reference for feature classes and feature datasets

Prerequisites

This is an intermediate course. Participants should be familiar with geodatabase concepts (feature classes, domains, etc.) and the software that interacts with the geodatabase (ArcMap, ArcCatalog, and ArcToolbox). Prerequisite skills may be obtained in *Introduction to ArcGIS II (for ArcView 8, ArcEditor 8, and ArcInfo 8)* or *What's New in ArcInfo 8*.

