

Object-Oriented Analysis and Design with UML

Length

3 Days

Description:

Using a balanced blend of lecture and exercises this course teaches essential object-oriented concepts and their application within a practical analysis and design process. The most common analysis and design methods are presented, including use case analysis, problem domain analysis, activity diagramming, interaction diagramming, and the application of design heuristics and patterns. Using the Unified Modeling Language (UML) to produce analysis and design modeling deliverables is also covered. The course also provides a brief introduction to object database technologies and distributed objects. Throughout the course emphasis is placed on techniques that improve system adaptability and component reuse.

Course Objectives:

After completing this course, you will be able to:

- Describe the concepts that define object-oriented systems
- Think about systems using objects
- Apply new tools including class diagrams, object interaction diagrams and design patterns
- Express your thoughts with the industry standard Unified Modeling Language (UML)

Audience:

This course is for people that want to learn the language independent process of designing an object-oriented application. It demonstrates how to transition seamlessly from analyzing user requirements to producing object-oriented code.

Prerequisites:

Familiarity with the software development process and the basic concepts of systems analysis and software design.

Course Content:

Chapter 1 - Concepts

- Encapsulation and Localization
- Objects
- Classes
- Messages and Methods
- Relationships
- Inheritance
- Polymorphism

Chapter 2 - The OO Development Process

- OO Development Objectives

- Roadmap of Phases, tasks and deliverables
- Review and Iteration

Chapter 3 - Requirements Gathering

- Introduction
- Use Cases
- Process Modeling
- Process Summary
- Exercise

Chapter 4 - Creating on Object Modeling

- Introduction
- Creating the model
- **Exploring Behavior**
- Finding Operations
- Object vs. Value Semantics
- Class Stereotypes
- Sequence Diagrams
- Collections
- Process Summary

Chapter 5 - Advanced Modeling Techniques

- Relationships
- Role Names
- Association classes
- Class Scope
- Visibility
- Navigability
- Qualified Associations
- Interfaces
- Abstract classes
- Collaboration Diagrams
- State Transition Modeling

Chapter 6 - Architectural Design

- Introduction
- Architectural Choices
- Process Summary

Chapter 7 - Object Design

- Introduction
- Design Guidelines
- Design Patterns

Chapter 8 - Storage and Distribution

- Storing Objects - OODBs
- Storing objects using a relational database
- Serialization
- Object Request Brokers
- Component Systems

Chapter 9 - Review of OO Development Methodology

- Modeling
- Phases
- Tasks
- Deliverables
- Iteration
- Prototyping
- Validation and Quality
- Project Roles
- Addressing Risk
- Maximizing OO Development Benefits