

**Introduction to Object-Oriented Analysis and Design with UML using Java**

**Course Number:** JAV-200  
**Duration:** 4 days

**Overview**

This OOAD with UML training teaches learners proven, real-world techniques to address the biggest challenge in software development: delivering quality systems that meet requirements – on time and within budget. This hands-on course focuses on practical skills, giving learners the knowledge and confidence to design well-structured software systems.

**Prerequisites**

Some programming experience is required.

**Materials**

All attendees receive comprehensive courseware covering all topics in the course.

**Software Needed on Each Student PC**

* Windows, macOS, or Linux with at least 8GB RAM
* A recent JDK version installed
* The Java tool the students are likely to use after the class (Eclipse or IntelliJ IDEA)
* Microsoft Access, SQL Server, or another relational database accessible via JDBC or ODBC

**Objectives**

* Define object-oriented programming and its role in software development
* Utilize UML diagrams to model software systems
* Compare iterative and agile software development processes
* Analyze use cases to capture system requirements
* Design and implement class diagrams using design patterns
* Evaluate and select appropriate design patterns for specific problems
* Explain the role of frameworks and tiers in software architecture

**Outline**

* Introduction to OOAD
  + Intro: Fields of Study
  + Object Orientation Overview
  + Object-Oriented Concepts
  + Stating the Case for Object Orientation
* Unified Modeling Language (UML)
  + Unified Modeling Language Defined
  + Static Diagrams: Use Case, Class, Package, Component, Deployment
  + Dynamic Diagrams: Collaboration, Sequence, State Chart, Activity
* The Software Development Process
  + Software Development Process Overview
  + Iterative Processes
  + Agile Processes
  + Unified Software Development Process
    - Phases
    - Iterations
    - Disciplines (Workflows)
    - Models
    - Use Case Driven, Architecture Centric, Iterative and Incremental
* The Inception Phase
  + Initial Planning
  + Business Modeling
  + Requirements Overview
* Introduction to Use Cases
  + Overview
  + Actors
  + Use Case Details
  + Create Initial Use Case Model
* Additional Modeling
  + Domain Modeling
  + Discovering Your Types
  + Technology Modeling
  + Non-functional Requirements
* Elaboration Phase
  + Initial Planning
  + Detailing Use Cases
  + Elaborating Use Cases
  + Refining Analysis Model
  + Architectural Use Cases, Detailing Use Cases, Elaborating Use Cases, Identify Analysis Classes
* Elaboration - Design
  + Dynamic Modeling
  + Frameworks and Tiers
  + OO Design Principles
  + Collaboration Modeling Object Refinement
* Introduction to Design Patterns
  + Introduction
  + Exploring a Simple Pattern - Iterator
  + Design Pattern Background
  + Examining Collection Traversal, Examining the Iterator Pattern
* Design Patterns: A More Formal Approach
  + The Gang of Four Description
  + The GOF Patterns
  + Discussing the GOF Patterns
* Moving Deeper Into Patterns
  + Factory Method Pattern
  + Strategy Pattern
  + Decorator Pattern
  + Template Method Pattern
  + Using Factory Method, Using Strategy, Considering Decorator
* Conclusion