

# **Enterprise System Architecture and Solution Design with UML**

## **Day 1 – Software Architecture Foundations and Enterprise Architecture**

### **1.1 Introduction to Software Architecture**

- What is Software Architecture?
- Importance of Architecture
- Role of Software Architect
- Characteristics of Good Architecture
- Architecture vs Design
- Architecture Documentation

### **1.2 SDLC and Architecture**

- Traditional SDLC
- Agile SDLC
- DevOps Lifecycle
- Architecture within SDLC

### **1.3 Architecture Principles**

- SOLID Principles
- DRY
- KISS
- YAGNI
- Separation of Concerns
- High Cohesion and Low Coupling

### **1.4 Architecture Quality Attributes**

- Scalability
- Availability
- Reliability
- Security
- Maintainability
- Extensibility
- Performance

### **1.5 Introduction to Enterprise Architecture**

- Business Architecture
  - Application Architecture
  - Data Architecture
  - Technology Architecture
- 

## **Day 2 – Architecture Patterns and Architectural Decision Making**

### **2.1 Traditional Architecture Patterns**

- Layered Architecture
- Client-Server Architecture
- Three-Tier Architecture
- N-Tier Architecture
- Event-Driven Architecture
- Service-Oriented Architecture (SOA)

### **2.2 Modern Architecture Patterns**

- Microservices Architecture
- Serverless Architecture
- Hexagonal Architecture
- Clean Architecture
- CQRS
- Event Sourcing

### **2.3 Architecture Evaluation and Selection**

- Architecture Decision Matrix
  - Requirement Analysis
  - Architectural Decisions
  - Technology Selection
- 

## **Day 3 – High-Level Design (HLD) and Enterprise Solution Design**

### **3.1 High-Level Design Fundamentals**

- Introduction to HLD
- Functional Requirements
- Non-Functional Requirements
- Architecture Diagram

- Module Design
- Integration Overview

## **3.2 Advanced HLD Concepts**

- Capacity Planning
- Infrastructure Planning
- Infrastructure Architecture Design
- API Identification
- Integration Architecture
- HLD Documentation Standards

## **3.3 Enterprise Integration Architecture**

- Designing Enterprise Applications
  - API Gateway Design
  - REST APIs
  - SOAP Services
  - Message Queues
    - Kafka
    - RabbitMQ
- 

# **Day 4 – Low-Level Design (LLD) and Secure Architecture**

## **4.1 Low-Level Design Fundamentals**

- Introduction to LLD
- Detailed Module Design
- Class Design
- Database Design
- Interface Design

## **4.2 Advanced LLD Concepts**

- Error Handling Strategy
- Logging Framework
- Exception Management
- Coding Standards

## **4.3 Security Architecture and Secure Design**

- Security Design
- Secure Coding Practices
- OAuth
- JWT

- Single Sign-On (SSO)
  - Multi-Factor Authentication (MFA)
- 

## **Day 5 – UML Modeling and Enterprise Documentation**

### **5.1 UML Fundamentals**

- Introduction to UML
- UML Building Blocks
- UML Relationships
  - Association
  - Aggregation
  - Composition
  - Dependency
  - Generalization
  - Realization
- UML Best Practices

### **5.2 UML Tools**

- Draw.io
- Lucidchart
- StarUML
- Visual Paradigm

### **5.3 Structural UML Diagrams**

- Class Diagram
- Object Diagram
- Package Diagram
- Component Diagram
- Composite Structure Diagram
- Deployment Diagram
- Profile Diagram

### **5.4 Behavioral UML Diagrams**

- Use Case Diagram
  - Activity Diagram
  - Sequence Diagram
  - Communication Diagram
  - State Machine Diagram
  - Timing Diagram
  - Interaction Overview Diagram
-

# **Day 6 – Cloud Architecture, Industry Case Studies and End-to-End Enterprise Architecture**

## **6.1 Cloud Architecture**

- Software as a Service (SaaS)
- Platform as a Service (PaaS)
- Infrastructure as a Service (IaaS)
- Cloud-Native Architecture Principles

## **6.2 Industry Architecture Case Studies**

- Banking System Architecture
- Insurance System Architecture
- Healthcare Architecture
- Retail Architecture
- ERP Architecture

## **6.3 End-to-End Enterprise Architecture Project**

- Requirement Gathering
  - Architecture Design
  - High-Level Design (HLD)
  - Low-Level Design (LLD)
  - UML Documentation
  - API Specifications
  - Database Design
  - Deployment Architecture
  - Security Review
  - Performance Review
  - High Availability Design
  - Disaster Recovery Planning
  - Architecture Governance
  - Architecture Review and Presentation
-