



Computer Society of India

Mumbai Chapter

Java Course Content

Advanced Java

Day 1

Servlet

Software development life cycle
Introduction To Java Servlets
Servlet API
Servlet Life-Cycle.
Working With Apache Tomcat
GenericServlets
HttpServlet
HttpSession
Session Binding/Tracking
Inter-Servlet Communication

Day 2

JSP

Software development life cycle
JSP SYNTAX.
Implicit Objects.
Custom Tags.
JSP Actions
JSP Expression

Day 3 & 4

Securing Web Applications

Software development life cycle
Injection
Broken authentication
Sensitive data exposure
XML external entities (XXE)
Broken access control
Security misconfiguration
Cross-site scripting (XSS)
Insecure deserialization.
Using components with known vulnerabilities
Insufficient logging & monitoring

Day 5

Spring

Software development life cycle
What is Spring?

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Business Focus
The Solution

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Sample App Intro
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Prerequisites
Sample App Setup
Sample App pom.xml Demo
Sample App Add Model Demo
Sample App Add Repository Demo
Sample App Add Service Demo
Sample App Run Application Demo
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Spring Download Maven Demo

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Application Context Demo
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XML Declaration
Beans
Bean Demo
Setter Injection
Setter Injection Demo
Constructor Injection
Constructor Injection Demo
Autowire
Autowire by Constructor Demo
Autowire by Name and Type Demo

Spring Annotation Configuration Using XML

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Application Context Demo
Component Scanner
Component Scanner Demo
Stereotype Annotations
Stereotype Annotations Demo

- Autowired
- Autowire Member
- Member Injection Demo
- Setter Injection
- Setter Injection Demo
- Constructor Injection
- Constructor Injection Demo
- JSR-330

Spring Configuration Using Java

- Java Configuration Introduction
- AppConfig
- AppConfig Demo
- @Configuration
- @Configuration Demo
- Setter Injection
- Setter Injection Demo
- Constructor Injection
- Constructor Injectio Demo
- Autowired
- Autowired Setup Demo
- Autowired Configuration Demo

Bean Scopes

- Bean Scope Introduction
- Patterns
- Scopes
- Singleton
- Singleton Java Config
- Singleton Java Config Demo
- Singleton Java Config Using a Constant Demo
- Singleton XML Config
- Singleton XML Config Demo
- Prototype
- Prototype XML Config Demo
- Prototype Java Config Demo
- Web Scopes

Properties

- Properties Introduction
- XML Config
- XML Config Demo
- XML Config Injection Demo
- Java Config
- Java Config Demo

Day 6

Configuring Your Environment for Spring MVC Application Development

Software development life cycle
Understanding Spring MVC Architecture
Spring MVC Configuration Overview
Demo: Spring MVC Configuration

Creating Controllers and Views

Introduction
Creating a Spring Controller and View
Demo: Creating a Spring Controller and View
Demo: Reading Form Data
Adding Data to the Spring Model
Demo: Adding Data to the Spring Model

Handling Spring Tags and Data Bindings

Introduction
Spring Form Tags Equivalent to HTML Tags
Demo: Using Spring Forms

Handling Request Parameters and Request Mappings

Introduction
Binding Request Parameters
Demo: Binding Request Parameters
Controller Level Request Mapping
Demo: Controller Level Request Mapping
Demo: @RequestMapping with Multiple URLs
Demo: @RequestMapping with @RequestParam
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Applying Built-in Validation Rules

Introduction
Spring MVC Form Validations Overview
Setting up Development Environment for Form Validations
Demo: Applying Validation Rules
Demo: Applying Validation Rules Size, Min, Max, Pattern, and Past
Pre-processing Code Validation Using @InitBinder
Creating Custom Validation Rules
Demo: Creating Custom Validation Rules

Performing CRUD Operations with Hibernate

Introduction
Overview of Hibernate
Setting up Development Environment for Supporting Hibernate Framework
Configuring Hibernate Properties Using XML File

Demo: Creating ORM Entity
Demo: Inserting a Record
Demo: Using HQL for Retrieving the Records
Demo: Updating the Record
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Creating REST Services

Introduction
Understanding REST API
Creating REST API Using @ResponseBody
Creating REST API Using @RestController
Consuming REST API Service

Day 7

Introducing Spring Boot and Its Benefits

Software development life cycle
Spring Boot Overview
Features of Spring Boot
Bootstrapping a Simple Application
Demo: Spring Initializr
Demo: Spring Boot CLI
Demo: Auto Configuration

Spring Boot Annotations
Spring Boot Properties
Spring Boot Profiles

Building a RESTful Web Application with Spring Boot

REST Architecture
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Demo: Testing with cURL
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Introducing Test-driven Development in Spring

Introduction
Test-driven Development in Spring

Testing a Spring Service with a SQL Backend

Review of the Controller
Testing the Controller
Adding DELETE functionality to the Controller using TDD
Testing the Service
Review of the Repository
Testing the Repository

Spring Security OAuth2

Introduction
The challenges with Authentication / Authorization in modern applications
Why tokens
Introducing Json Web Tokens (JWT)
A journey into OAuth2
Authorization Code Grant
OAuth2 is not Authentication
Why we need OpenId Connect
What makes OIDC great for Authentication
OIDC Authorization Code Grant Flow
Spring Security 5 the new direction

Day 8

ES6 Overview

Software development life cycle
Classes & Modules
De-structuring Objects & Arrays
Template String
Spread & Rest operators
Arrow Functions
Optional and Named Parameters
Generators and Iterators

Webpack and Babel.js

Module Bundling Overview
Installation
Basic Webpack Configurations
Create-React-App

Introduction to ReactJS

What is ReactJS?
Need for React – Why React?
ReactJS vs other JS libraries and frameworks
Introduction to Virtual DOM

Introduction to JSX

JSX Syntax
Using JSX to create React elements
JSX Pre-compilation
Working with Bootstrap.css
JSX Expressions
propTypes (Validation)
Re-using React components
props vs state
Debugging React

Event Handling in React

Event Delegation Model

Day 9

Software development life cycle

Two Way data binding in React

Working with React Plugins

Component Life cycle

componentWillMount

componentDidMount

componentWillReceiveProps

shouldComponentUpdate

componentDidUpdate

componentWillUnmount

Best practices with Component Life cycle

Mixin role in Component Life Cycle

Forms

Controlled Components

Uncontrolled Components

Principle of One-Way and Two-Way Data Binding

Models

Advantages of Immutability

Using Immutable.js

Advanced Webpack

Setting up webpack-dev-server

Configure automatic browser refresh

Loading Modules

Optimizing re-bundling of react components

Hot loading components

Day 10

Redux

Software development life cycle

Introduction to Redux

Overview of Reactive Programming

Benefits of Uni-directional data flow

Building Blocks of Redux

Views

Store

Reducer

Dispatcher

State Tree

Actions

Pure / Impure functions

State Mutations

CombineReducer