

Mastering JEE 7 Web Application Development

Course Overview

This is a 5-day class

This is a course geared for experienced Java developers new to JEE, who need to get up and running with essential dynamic web development skills.

Who Should Attend

Experienced Java developers, new to Java EE (JEE) 7

Course Objectives

Students who attend Mastering JEE 7 Web Application Development will leave the course armed with the required skills to design and build scalable, secure, maintainable web applications; leveraging our extensive experience in the delivery of scalable enterprise applications with complex web interfaces based on JEE technologies.

Throughout this training, you will be confronted with common web application design problems and given the tools you will need to solve them, such as JEE design patterns. You will also be exposed to a range of JEE and web technologies such as Servlets, JSPs, JSF, JNDI, CDI and advice on when and how to use them. Students will also learn about the capabilities of servlets, their advantages, servlet architecture, and session management. Developers will also learn about managing resources, deployment, and application models, how to use custom tags, and how to build robust and capable web applications using servlets and other components.

The course begins with a discussion of web application architecture. A major part of the course is spent on the various web components that are used to implement dynamic web applications. Students will learn not only specific topics and APIs but also how to fit the pieces together into a complete application.

Course Outline

1 ENTERPRISE DEVELOPMENT

Enterprise Application Software
Requirements of Enterprise applications
Scalability, Load Balancing, Fail Over
Resource pooling

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2 JAVA EE CORE COMPONENTS

Overview of Java EE Core Components
Web Tier Components
Application Tier
Deployable Units
Deployment Descriptors
The Java Naming and Directory Interface (JNDI)
Tutorial: Working with Eclipse Neon (JEE Version) and Tomcat 8.5
Tutorial: Setup the Tomcat 8.5 Manager Application

3 INTRODUCTION TO SERVLETS

The Servlet Interface
The Web Container
Creating HTML Output Using Servlets
The @WebServlet Annotation
Interaction Between web.xml and Annotations
The @WebInitParam Annotation
Exercise: A First Servlet

4 FORM PROCESSING USING SERVLETS

Using HTML5 Forms with Servlets
Processing Request Parameters
HttpServletRequest Methods
HttpServletResponse Methods
Exercise: Form Processing

5 JAVA SERVER PAGES

Java Server Pages (JSPs)
The Relationship Between JSPs and Servlets
The JSP lifecycle
The role of JSPs in Java EE 7
Exercise: A First JSP

6 IMPLEMENTING MVC IN JEE

Model View Control
Using the RequestDispatcher
Handling Requests
The Request Scope
Handling Request Attributes
The Expression Language (JSR 341)
EL in Template text
Exercise: Implementing MVC

7 SESSION MANAGEMENT

Sessions in Web Applications
The HttpSession object
Session Management in Java EE
Handling Cookies
URL-Rewriting
Exercise: Managing Sessions

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8 SERVLET FILTERS

- Introduce Servlet Filters
- Modify the request data
- Modify the response data
- The @WebFilter annotation
- Define Filter Mappings
- Move functionality out into a decorator pattern
- Exercise: Adding Filters

9 OVERVIEW OF EL

- The Expression Language (JSR 341)
- Value and Method Expressions
- Immediate and Deferred Evaluation Syntax
- Read and Read/Write expressions

10 THE EL LANGUAGE

- EL Operators
- EL Reserved Words
- EL Implicit objects
- Referencing Objects using EL
- Exercise: Working with EL

11 INTRODUCTION TO CUSTOM TAGS

- Custom tags
- Using the taglib Page Directive
- The TLD File
- The Tag Implementation Class

12 THE JAVA STANDARD TAG LIBRARY

- JSTL Overview
- Use JSTL to Iterate Over Collections of Data
- JSTL functions
- Exercise: Using JSTL

13 INTRODUCTION TO CDI

- Context Dependency Injection (CDI)
- The @Inject Annotation
- The @Default Annotation
- The @Alternative Annotation
- The @Named Annotation
- Exercise: Using CDI

14 USING CDI

- Qualifiers
- @PostConstruct and @PreDestroy
- The @Produces Annotation
- Exercise: Using Qualifiers

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15 CDI AND JAVA EE

CDIs Relationship to Java EE
The @Model annotation
Built-in CDI scopes
Exercise: Using CDI and Servlets

16 JEE DATASOURCES

DataSources in JEE
Setup a DataSource
Using CDI to inject a DataSource
Exercise: Using DataSources

17 OVERVIEW OF JPA

Introduce the Java Persistence API (JPA)
Benefits of Using an ORM framework
Hibernate and JPA
Exercise: Using JPA

18 INTRODUCTION TO WEBSOCKET

Java API for WebSocket Overview
Using WebSocket in Java EE
Endpoint Instances

19 IMPLEMENTING WEBSOCKET ENDPOINT

Annotated Endpoints
Receiving messages
Send Response to Client(s)
JavaScript to Setup a WebSocket Connection
Exercise: Implementing a WebSocket

20 EXTENDING WEBSOCKETS

Manage Client State
Encoding and Decoding Messages
Handling Errors
Exercise: Encoding and Decoding Messages

21 INTRODUCTION TO BEAN VALIDATION

Bean Validation
Define Constraints on Object Models
Core Validation Annotations
Validate Objects and Object Graphs
Exercise: Bean Validation

22 BEAN VALIDATION

Validate Parameters and Return Values
Develop Custom Constraints
Exercise: Creating Constraints

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23 WEB FRAGMENTS

Need for Web Fragments
The web-fragment Element
Fragment Ordering
Exercise: Fragments

24 ERROR HANDLING

Handling HTTP Errors Codes
Handling Exceptions

25 ASYNCHRONOUS SERVLETS

Invoking a Long Running Process
The asyncSupported Attribute
Using the AsyncContext Class
Handling AsyncEvent Objects
Nonblocking I/O in Servlets
Exercise: ASync Servlets

26 WEB SECURITY

Specify the Servlet Security Model
Roles in the Web Application
Access Control and Authentication Requirements
Security-Related Annotations
Servlet 3.1 Predefined Roles
The deny-uncovered-http-methods XML Element
Exercise: Web Security

27 INTRODUCTION TO JSF

JSF Overview
The JSF Components
Configuring a JSF Application
MVC using JSF
Exercise: First JSF

28 JSF COMPONENTS

Understand the component architecture of JSF
Explain the use of the RenderKit
User Interface Component Model
Introduce the JSF Custom Tags
Explain the functionality of the various input tags
Panels and tables in JSF
Exercise: JSF HTML Tags

29 FACELETS

Facelets as View Handlers
Custom Tags Used in Facelets
The @Named Annotation
The @RequestScoped and @SessionScoped Annotations
Using the dataTable Custom Tag
Exercise: Working With Facelets

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30 FACELETS TEMPLATING AND RESOURCES

Creating a Consistent Look and Feel

Templating and Placeholders

JSF resource management

Exercise: Facelets Templating