



Module Presenter's Manual *for* **Web Component Development (Java)**

***Effective from: September 2017
Ver. 1.0***



Amendment Record

Version No.	Effective Date	Change	Replaced Pages
1.0	September 2017	New	-

For Aptech Centre Use Only

Table of Contents

Sr. No.	Details	Page No.
1.	Introduction	1
2.	Information on Session Allocation	1
3.	Module Deliverables available on OnlineVarsity	2
4.	Week-wise Session Schedule	4
5.	Session Coverage	5
6.	Library References	16

1. Introduction

At the end of this course, students will be able to:

- Explain Servlets and its lifecycle.
- Understand and create robust web applications using MVC architecture, session management, filters, and database integration.
- Explain JSP and develop JSP pages.
- Understand and create easy to maintain view components using JSP pages, the Expression Language, and elements of the JSP Standard Tag Library (JSTL)
- Create secure Web applications using the features of the Java EE web container.

2. Information on Session Allocation

Module	Online (No. of Hrs)
Web Component Development	40

Throughout this Presenter's Manual, the module **Web Component Development** will be referred to as **SERVJSP**.


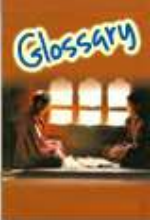





3. Module Deliverables available on OnlineVarsity



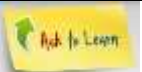
To aid the learning process, following are the deliverables

Student Deliverables:

1. Learner's Guide (eBook)

Resources available on OnlineVarsity for Students:

Icons	Feature - Description/Functionality
	Download Book - Student has the option to download the subject related e-book and read offline.
	Glossary - Student can access a list of subject related specialized words with their definitions.
	FAQ - Student can access frequently asked questions and their answers.
	Show Me How - Student can view a step-wise simulation/demonstration of the module related topics.
	Practice 4 Me - Student can test and evaluate their understanding of module related topics.
	Work Assignments - Student can solve scenario based lab assignments (Hands-on). The faculty will evaluate and give their feedbacks.
	Download Source code/Files – Student can download courseware related source files.

	References - Student can access additional subject related material for reading.
	Feedback - Student can provide feedback on the course material.
	Ask to Learn – Student can submit subject related technical queries. Queries submitted will be directed to the particular course coordinator/head.

4. Week-wise Session Schedule

- A Session has duration of 2 hours.

➤ Week-Wise Schedule

Wk	Day 1	Day 2	Day 3	Day 4
1	Session 1 SERVJSP- TL1	Session 2 SERVJSP- TL2	Session 3 SERVJSP- TL3	Session 4 SERVJSP- TL4
2	Session 5 SERVJSP- TL5	Session 6 SERVJSP- TL6	Session 7 SERVJSP- TL7	Session 8 SERVJSP- TL8
3	Session 9 SERVJSP- TL9	Session 10 SERVJSP- TL10	Session 11 SERVJSP- TL11	Session 12 SERVJSP - TL12
4	Session 13 SERVJSP- TL13	Session 14 SERVJSP- TL14	Session 15 SERVJSP- TL15	Session 16 SERVJSP- TL16
5	Session 17 SERVJSP- TL17	Session 18 SERVJSP- TL18	Session 19 SERVJSP- TL19	Session 20 SERVJSP- TL20

SERVJSP: Web Component Development

TL: Online Session

5. Session Coverage

Session No.	Session Title	Session Details	Deliverables' Mapping
1	SERVJSP-TL1	<p>All the topics as listed below from Session 1 and Session 2 of <i>Web Component Development using Java</i> book should be covered in this session.</p> <p><u>Session 1 – Introduction to Web Applications</u></p> <ul style="list-style-type: none"> ➤ Explain the purpose of different applications ➤ Explain Web applications and their advantages ➤ Describe the architecture and components of Web application ➤ Describe the role of HTTP protocol and its methods used for accessing Web pages ➤ Explain the use of Common Gateway Interface (CGI) language ➤ Explain the different types of components used in developing Web application ➤ Explain the advantages and disadvantages of Servlets ➤ Explain the services provided by a Web container ➤ Describe the life cycle and directory structure of a Web application ➤ Explain how to package Web application ➤ Develop a Web application in NetBeans Integrated Development Environment (IDE) <p><u>Session 2 – Java Servlet</u></p> <ul style="list-style-type: none"> ➤ Explain the Servlet API ➤ Explain the servlet architecture and life cycle of Servlet ➤ Explain the methods of ServletRequest and 	<p><u>Web Component Development using Java</u></p> <p>SG - Session 1 & 2 XP - Session 1 & 2 TG- Session 1 & 2</p>

Session No.	Session Title	Session Details	Deliverables' Mapping
		<p>HttpServletRequest interfaces</p> <ul style="list-style-type: none"> ➤ Explain the methods of ServletResponse and HttpServletResponse interfaces ➤ Describe the use of response headers ➤ Explain how to read text and binary data from a request ➤ Explain the ServletConfig and ServletContext interface ➤ Explain redirection of client requests ➤ Explain RequestDispatcher interface ➤ Explain error handling in Servlet 	
2	SERVJSP-TL2	<p>The workshop lessons of Session 1 and Session 2 of <i>Web Component Development using Java</i> course should be covered in this session.</p>	<p><u>Web Component Development using Java</u></p> <p>(OnlineVarsity)</p> <p>Session 1 Session 2</p>
3	SERVJSP-TL3	<p>All the topics as listed below from Session 3 and Session 4 of <i>Web Component Development using Java</i> book should be covered in this session.</p> <p><u>Session 3 – Session Tracking</u></p> <ul style="list-style-type: none"> ➤ Describe the stateless nature of HTTP protocol ➤ Explain the need of tracking client identity and state ➤ Explain the URL rewriting method for session tracking ➤ Explain how to use hidden form fields ➤ Explain the use of Cookie class and its methods ➤ Explain how to store and retrieve information in a session 	<p><u>Web Component Development using Java</u></p> <p>SG - Session 3 & 4 XP - Session 3 & 4 TG - Session 3 & 4</p>

Session No.	Session Title	Session Details	Deliverables' Mapping
		<ul style="list-style-type: none"> ➤ Describe the use of HttpSession interface and its methods ➤ Explain how to invalidate a session <p><u>Session 4 – Filters and Annotations</u></p> <ul style="list-style-type: none"> ➤ Explain the concept and working of filters ➤ List the benefits of filters ➤ Explain the Filter API interfaces and there methods ➤ Explain the use of wrapper classes in managing Servlets ➤ Explain how to alter a request and response using filters ➤ Describe the basic concept of annotations ➤ Explain the different types of annotations supported in Servlet API ➤ Explain the steps to upload the file using HTML form elements ➤ Explain the mechanism to upload files on the server using Servlet 	
4	SERVJSP-TL4	The workshop lessons of Session 3 and Session 4 of <i>Web Component Development using Java</i> course should be covered in this session.	<p><u>Web Component Development using Java</u></p> <p>(Onlinevarsity)</p> <p>Session 3 Session 4</p>
5	SERVJSP-TL5	<p>All the topics as listed below from Session 5 and Session 6 of <i>Web Component Development using Javabook</i> should be covered in this session.</p> <p><u>Session 5 – Database Access and Event Handling</u></p> <ul style="list-style-type: none"> ➤ Explain database handling using JDBC ➤ Describe JDBC and its role ➤ Explain connecting database 	<p><u>Web Component Development using Java</u></p> <p>SG - Session 5 & 6 XP - Session 5 & 6 TG - Session 5 & 6</p>

Session No.	Session Title	Session Details	Deliverables' Mapping
		<p>using JDBC</p> <ul style="list-style-type: none"> ➤ Describe JPA and its role ➤ Describe connecting database using JPA ➤ Explain the significance of session handling and session events ➤ Explain different types of listener interfaces used in Servlets <p><u>Session 6 – Asynchronous Servlet Communication</u></p> <ul style="list-style-type: none"> ➤ Explain the need of Asynchronous Servlet ➤ Explain how to create Asynchronous Servlet and Asynchronous Listener ➤ Explain the concept of server push mechanism ➤ Explain how to create an asynchronous JavaScript client using XMLHttpRequest object ➤ Explain the need of non-blocking I/O support in Servlet ➤ Explain how to implement non-blocking I/O in asynchronous Servlet ➤ Explain the need for protocol upgrade ➤ Explain the process of protocol upgrade in a Servlet 	
6	SERVJSP-TL6	The workshop lessons of Session 5 and Session 6 of <i>Web Component Development using Java</i> course should be covered in this session.	<p><u>Web Component Development using Java</u></p> <p><u>(OnlineVarsity)</u></p> <p>Session 5 Session 6</p>

Session No.	Session Title	Session Details	Deliverables' Mapping
7	SERVJSP-TL7	<p>All the topics as listed below from Session 7 and Session 8 of <i>Web Component Development using Java</i> book should be covered in this session.</p> <p><u>Session 7 – JavaServer Pages</u></p> <ul style="list-style-type: none"> ➤ Explain the need of JSP ➤ List the benefits of JSP ➤ Identify the situations where to use JSP and servlets ➤ Explain JSP architecture ➤ Identify various phases in the life cycle of a JSP page ➤ Explain the various scriptlet elements in JSP ➤ List and explain the use of various directives in JSP <p><u>Session 8 –JSP Implicit Objects</u></p> <ul style="list-style-type: none"> ➤ Explain the concept of implicit objects in JSP ➤ List various types of implicit objects in JSP ➤ Explain how to use the request object ➤ Explain how to use the response object ➤ Explain how to use the out object ➤ Explain how to use the session object ➤ Explain how to use the application object ➤ Explain how to use the pageContext object ➤ Explain how to use the page object ➤ Explain how to use the config object ➤ Explain how to use the exception object application 	<p><u>Web Component Development using Java</u></p> <p>SG - Session 7 & 8 XP – Session 7 & 8 TG - Session 7 & 8</p>

Session No.	Session Title	Session Details	Deliverables' Mapping
8	SERVJSP-TL8	The workshop lessons of Session 7 and Session 8 of <i>Web Component Development using Java course</i> should be covered in this session.	<p><u>Web Component Development using Java</u></p> <p>(OnlineVarsity)</p> <p>Session 7 Session 8</p>
9	SERVJSP-TL9	<p>All the topics as listed below from Session 9 and Session 10 of <i>Web Component Development using Java book</i> should be covered in this session.</p> <p><u>Session 9 – Standard Actions and JavaBeans</u></p> <ul style="list-style-type: none"> ➤ Explain the concept of standard actions in JSP ➤ Explain how to use the <jsp:include> element ➤ Explain how to use the <jsp:forward> element ➤ Explain how to use the <jsp:param> element ➤ Explain how to use the <jsp:plugin> element ➤ Explain how to use the <jsp:fallback> element ➤ Explain how to use the <jsp:text> element ➤ Explain the concept of JavaBeans ➤ Explain how to declare and access JavaBeans components in JSP ➤ Explain accessing JavaBean properties from scripting elements ➤ Explain how to access non-string data type properties from scripting elements ➤ Explain how to access indexed properties from scripting elements 	<p><u>Web Component Development using Java</u></p> <p>SG - Session 9 & 10 XP - Session 9 & 10 TG - Session 9 & 10</p>

Session No.	Session Title	Session Details	Deliverables' Mapping
		<p><u>Session 10 – Model-View-Controller Architecture</u></p> <ul style="list-style-type: none"> ➤ Describe the use of JSP models in Web applications ➤ Explain JSP Model 1 ➤ Explain JSP Model 2 ➤ Explain the Model-View-Controller architecture ➤ Explain the relationship between the components of MVC ➤ Explain Controller and its purpose in MVC ➤ Explain View and its purpose in MVC ➤ Explain Model and its purpose in MVC ➤ Develop a Web application based on MVC architecture 	
10	SERVJSP-TL10	The workshop lessons of Session 9 and Session 10 of <i>Web Component Development using Java</i> course should be covered in this session.	<p><u>Web Component Development using Java</u></p> <p>(OnlineVarsity)</p> <p>Session 9 Session 10</p>
11	SERVJSP-TL11	<p>All the topics as listed below from Session 11 of <i>Web Component Development using Java</i> book should be covered in this session.</p> <p><u>Session 11 – JSP Expression Language</u></p> <ul style="list-style-type: none"> ➤ Explain how to use script expressions in JSP ➤ Describe the implicit objects used in EL ➤ Describe the various operators used in EL ➤ Explain how to create static method and tag library descriptor using EL 	<p><u>Web Component Development using Java</u></p> <p>SG - Session 11 XP - Session 11 TG - Session 11</p>

Session No.	Session Title	Session Details	Deliverables' Mapping
		<ul style="list-style-type: none"> ➤ Explain how to modify deployment descriptor using EL ➤ Explain how to access EL functions within JSP ➤ Explain the concept of boxing and unboxing ➤ Explain how to coerce a value to string or number type 	
12	SERVJSP-TL12	<p>The workshop lessons of Session 11 of <i>Web Component Development using Java</i> course should be covered in this session.</p>	<p><u>Web Component Development using Java</u> <u>(OnlineVarsity)</u></p> <p>Session 11</p>
13	SERVJSP-TL13	<p>All the topics as listed below from Session 12 of <i>Web Component Development using Java</i> book should be covered in this session.</p> <p><u>Session 12 – JavaServer Pages Standard Tag Library</u></p> <ul style="list-style-type: none"> ➤ Explain the concept and need for JSTL ➤ List the advantages of using JSTL ➤ Describe the different tag libraries available in JSTL ➤ Explain how to configure JSTL library in NetBeans ➤ Explain general purpose tags ➤ Explain decision-making in the tags ➤ Explain iteration tags in the core tag library ➤ Explain the different tags available in the SQL tag library 	<p><u>Web Component Development using Java</u></p> <p>SG - Session 12 XP - Session 12 TG - Session 12</p>
14	SERVJSP-TL14	<p>The workshop lessons of Session 12 of <i>Web Component Development using Java</i> course should be covered in this session.</p>	<p><u>Web Component Development using Java</u> <u>(OnlineVarsity)</u></p> <p>Session 12</p>

Session No.	Session Title	Session Details	Deliverables' Mapping
15	SERVJSP-TL15	<p>All the topics as listed below from Session 13 of <i>Web Component Development using Java book</i> should be covered in this session.</p> <p><u>Session 13 – JSP Custom Tags</u></p> <ul style="list-style-type: none"> ➤ Explain JSP custom tags in JSP ➤ Describe the common terminology used in JSP custom tags ➤ Explain the working of custom tag libraries ➤ Explain the different types of custom tags available in JSP ➤ Explain how to create classic custom tags ➤ Explain use of Tag Extension API ➤ Explain Simple Tags API 	<p><u>Web Component Development using Java</u></p> <p>SG - Session 13 XP - Session 13 TG - Session 13</p>
16	SERVJSP-TL16	<p>The workshop lessons of Session 13 of <i>Web Component Development using Java course</i> should be covered in this session.</p>	<p><u>Web Component Development using Java</u></p> <p>(OnlineVarsity)</p> <p>Session 13</p>
17	SERVJSP-TL17	<p>All the topics as listed below from Session 14 and Session 15 of <i>Web Component Development using Java book</i> should be covered in this session.</p> <p><u>Session 14 – Internationalization</u></p> <ul style="list-style-type: none"> ➤ Explain the concept of internationalization ➤ Explain the concept of localization ➤ Explain the role of Unicode character set in internationalization ➤ Explain the resource bundling mechanism and resource 	<p><u>Web Component Development using Java</u></p> <p>SG - Session 14 & 15 XP - Session 14 & 15 TG - Session 14 & 15</p>

Session No.	Session Title	Session Details	Deliverables' Mapping
		<p>bundle for various locales</p> <ul style="list-style-type: none"> ➤ Explain how to format dates in servlets for internationalization ➤ Explain how to format currency in servlets for internationalization ➤ Explain how to format numbers in servlets for internationalization ➤ Explain how to format percentages in servlets for internationalization ➤ Explain how to format messages in servlets for internationalization ➤ Explain various tags available in the JSTL internationalization tag library ➤ Explain how to format dates and currencies using JSTL I18N tags ➤ Explain how to format percentages and messages using JSTL I18N tags <p><u>Session 15 – Securing Web Applications</u></p> <ul style="list-style-type: none"> ➤ Explain the need and features of securing Web applications ➤ Describe the HTTP basic, digest, client, and form-based authentication method of ensuring security ➤ Explain how to configure users in Tomcat ➤ Explain how to specify authentication mechanisms using web.xml ➤ Describe the seven steps to implement declarative security ➤ Explain the concept and five steps to implement programmatic security ➤ Describe the HttpServletRequest methods 	

Session No.	Session Title	Session Details	Deliverables' Mapping
		for identifying users	
18	SERVJSP-TL18	The workshop lessons of Session 14 of <i>Web Component Development using Java</i> course should be covered in this session.	<u>Web Component Development using Java</u> <u>(OnlineVarsity)</u> Session 14
19	SERVJSP-TL19	All the topics as listed below from Session 15 of <i>Web Component Development using Java</i> book should be covered in this session. <u>Session 15 – Securing Web Applications</u> <ul style="list-style-type: none"> ➤ Explain the need and features of securing Web applications ➤ Describe the HTTP basic, digest, client, and form-based authentication method of ensuring security ➤ Explain how to configure users in Tomcat ➤ Explain how to specify authentication mechanisms using web.xml ➤ Describe the seven steps to implement declarative security ➤ Explain the concept and five steps to implement programmatic security ➤ Describe the HttpServletRequest methods for identifying users 	<u>Web Component Development using Java</u> SG - Session 15 XP - Session 15 TG - Session 15
20	SERVJSP-TL20	The workshop lessons of Session 15 of <i>Web Component Development using Java</i> course should be covered in this session.	<u>Web Component Development using Java</u> <u>(OnlineVarsity)</u> Session 15

6. Library References

➤	Java EE 7 Developer Handbook by Peter A. Pilgrim
➤	Java Server Programming Java EE7 (J2EE 1.7): Black Book by Kogent Learning Solutions Inc.
➤	Murachs Java Servlets & JSP (Murach: Training & Reference) by Joel Murach, Michael Urban

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