

ITP246

Java Server-Side Programming

COURSE OUTLINE

Prerequisites:

ITP 220 or the divisional approval.

Course Description:

Catalog description: ITP 246 Java Server-Side Programming (4 CR) Prerequisite: ITP 220 or divisional approval. Provides instruction in application and integration of web-based clients and server-side Java to three-tier business applications. Includes use of tools UML, XML, Java servlets, JSPs and JDBC database access. Lecture 4 hours per week.

ITP 246 is the third semester of Java programming. The Java programming language is one of the most important computer languages for both client-side and server-side applications. Java allows you write intranet applications and other e-business solutions that are the foundation of corporate computing. It also is integral to the development of client-side applications for everything from games to Droid applications.

This course builds on the fundamentals of the first two Java programming classes (ITP120 and ITP220). Server-side applications are the main focus, looking at tools that will aid in web application development.

Topics included allow the student to prepare for the Oracle Certified Professional, Java Enterprise Edition 5 Web Component Developer Certified Professional Exam. The actual certification test is not a required part of the course.

Semester Credits: 4 Lecture Hours: 4 Lab/Recitation Hours:0 *Select Hours*

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Course Outcomes

At the completion of this course, the student should be able to:

1. Understand the concepts of server-side programming
2. Understand web servers and web application servers.
3. Be able to write server-side applications utilizing servlets and JSPs
4. Understand how to make script-free JSP code
5. Be able to work with the JSTL
6. Understand MVC, Conversational States, Sessions, and JavaBeans
7. Be able to program for database access from your applications
8. Understand how to connect Java to databases with both raw code and tools such as JPA
9. Understand how Java handles web security
10. Understand the advanced concepts of frameworks in server-side Java applications
11. Be able to work with JavaServer Faces
12. Understand the concepts of threading, especially their server-side applications.

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Required Materials:

NetBeans Software (free download from the Internet)

Textbook:

Required (note – the last book can be read on Safari Online):

Murach's JavaServlets and JSPs, 3rd edition by Murach and Urban (Murach)
ISBN 978-1890774783 (referred in the syllabus as Murach)

Core JavaServer Faces, 2nd ed by Geary and Horstmann (Prentice Hall) ISBN
978-0137012893

The following supplementary materials are available:

1. Safari Online is available for students to view other Java text and reference books online for free
2. Internet searches are a fundamental source for auxiliary materials on Java
3. Materials from the Oracle Academy of which Virginia Western is a member
4. Video movies provided by the instructor.

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Topical Description: (Outline chapters and sections to be covered in the book – may include timeline)

Tomcat Project: Install an external Tomcat server and deploy an application to the server

Module 1: Introduction to JSPs, Servlets, and Web apps- Overview

Learning objectives:

1. Understand what a Web app server is
2. Review (or learn) basic XHTML5 and CSS3
3. Understand the difference between a static and dynamic app
4. Describe the role of containers in server-side Java
5. Be introduced to servlet/JSP development
6. Understand the concepts of MVC
7. Build a simple MVC application
8. Understand how to use NetBeans for server-side Java apps
9. Understand how to work with web.xml and other XML files

Reading Assignment:

1. Textbook – **Murach** – Chapters 1-4 as follows
 - a. Chapter 1 – do the whole thing
 - b. Chapter 2 – do the whole thing
 - c. Chapter 3 – use as a reference on how to use NetBeans for server side applications. Scan the Tomcat material but do not install – it will be installed as a part of NetBeans so you do not have to do it separately.
 - d. Chapter 4 – review of HTML5 and CSS3

Laboratory Assignment:

1. See Blackboard

Module 2: Introduction to Servlets and JSP

Learning objectives:

1. Understand the anatomy of a servlet
2. Be able to describe what happens in each phase of the lifecycle of a servlet
3. Describe servlet containers
4. Understand what is included in the deployment descriptor (the web.xml file)
5. Understand how to code JSPs
6. Understand JSP expressions, and scriptlets
7. Understand JSP variables, and declarations
8. Be able to declare the implicit objects in JSPs

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9. Understand the life cycle and initialization of a JSP
10. Understand JSP directives
11. Understand how to forward requests and redirect responses
12. Be able to include a file in a JSP

Reading Assignment:

1. Textbook **Murach** Chapters 4-5

Laboratory Assignment:

1. See Blackboard

Module 3: Conversational States, Cookies, Sessions, and Working with HTTP Requests and Responses

Learning objectives:

1. Understand why session tracking is hard with HTTP
2. Understand how session tracking works in Java
3. Be able to work with session tracking and cookies
4. Understand URL rewriting
5. Be able to work with the request and response headers
6. Understand how to return a spreadsheet
7. Be able to compress a response with GZIP

Reading Assignment:

1. Textbook **Murach** – Chapters 7 and 18

Laboratory Assignment

1. See Blackboard

Module 4: Script-free Pages, Custom Tags, and JSTL

Learning Objectives:

1. Be able to use the expression language (EL)
2. Understand the various ways to map values
3. Be able to describe the implicit objects
4. Be able to distinguish the two types of “include”
5. Be able to work with the JSTL core library
6. Be able to use the <jsp:forward> tag
7. Understand what is available in the JSTL
8. Know how to use the set and remove tags
9. Understand the param and import tags
10. Be able to do conditional control with the if and choose tags

Reading Assignment

1. Textbook – **Murach** – Ch 8-9

Laboratory Assignment



1. See Blackboard

Module 5: Database Access and Security Issues

Learning Objectives:

1. Understand how to add database access to your projects
2. Understand what a DataSource is and the advantages of using one
3. Understand the SQL tags available in the JSTL
4. Recognize the limitations of using the JSTL SQL tags
5. Understand what stored procedures are and the advantages of using these
6. Understand authentication
7. Be able to restrict your web resources
8. Understand how to implement a security realm
9. Be able to use security in your applications

Reading Assignment

1. Textbook – **Murach** - Chapter 11-12, 16
2. Handouts and extra reading

Laboratory Assignment

1. See Blackboard

Module 6: How to use JPA and Threading topics

Learning Objectives:

1. Be able to understand the concept of and need for ORMs
2. Understand JPA entities
3. Understand how to retrieve data with JPAs
4. Understand how to modify data with JPAs
5. Become fluent in threading concepts in Java

Reading Assignment

1. Textbook – **Murach** - Ch 13
2. Handouts on threading

Laboratory Assignment

1. See Blackboard

Module 7: Intro to the Music Store Web Site

Learning Objectives:

1. Be able to work through a complete data driven server-side e-commerce application

Reading Assignment

1. Textbook – **Murach** – Ch 22-23

Laboratory Assignment

1. see Blackboard



Mod 8: Continue JavaServer Faces

Learning Objectives:

1. Understand the concept of a managed bean
2. Be able to work with message bundles
3. Understand the expression language syntax
4. Be able to implement dynamic navigation and redirection
5. Understand RESTful navigation
6. Be able to work with the JSF core tags
7. Understand how to interact with HTML form element through JSF
8. Learn how to integrate PrimeFace plugins into JSF applications

Reading Assignments:

1. Textbook – **Murach** - 21
2. Textbook – **core JSF** - Ch 1-6 or as assigned
3. See references at primefaces.org

Laboratory Assignment

1. see Blackboard

Project: Complete the e-commerce tutorial at

<https://netbeans.org/kb/docs/javaee/ecommerce/intro.html>



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Notes to Instructors

(List information about optional topics, departmental exams, etc.)

1. Each module is two weeks long and requires both a quiz and a laboratory assignment submitted through Blackboard
2. A half-semester long project may be included.
3. A comprehensive final exam may replace the project.
4. Preparation for the Oracle Certified Professional, Java Enterprise Edition 5 Web Component Developer Certified Professional Exam. The actual exam is optional.

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