



DESCRIPTOR SYSTEMS

"We Bring You Up To Speed"

JEE Web Application Programming

Description: This class covers how to develop JEE Web applications that use servlets and JSPs. This class combines the standalone Servlet and JSP Programming workshops into a single, five-day course.

Audience: Experienced Java developers that wish to learn how to program JEE Web applications.

Prerequisites: Prior Java programming experience is required.

Length: 5 days

Format: Lecture with hands-on lab exercises.

Objectives: After taking this course, you will be able to:

- Write Java servlets that respond to HTTP forms
- Write JavaServer Pages that display dynamic content
- Use the JSP Standard Tag Library in JSPs
- Write JSP custom tag libraries
- Create J2EE Web applications in the standard structure
- Use HTTP sessions in servlets and JSPs
- Access relational data from J2EE Web applications
- Write a simple Apache Struts application

Detailed Topic List:

1. Introduction to the Course

- J2EE Web Applications
- Legal Information
- J2EE Web Applications
- Introductions
- Course Description

- Course Objectives
- Sample Agenda
- Sample Agenda, cont'd
- Sample Agenda, cont'd

2. Web Architecture Review

- Web Architecture Review
- What is HTML?
- What is HTTP?
- Common HTTP Methods
- What is a URL?
- HTML Forms
- HTML Forms, cont'd
- What is CGI?
- A Sample Perl CGI Script
- What's Wrong with CGI?
- CGI Enhancements and Alternatives
- Microsoft's ASP
- A Sample ASP
- What is Java2 Enterprise Edition?
- Chapter Summary

3. Introduction to Servlets

- Introduction to Servlets
- What is a Servlet?
- Why Use Servlets?
- Servlet Containers
- The Servlet API
- Writing a Servlet
- A Sample Servlet
- Chapter Summary

4. Installing and Configuring a Servlet Container

- Installing and Configuring a Container
- Basic Requirements
- Additional Support
- Basic Installation
- Configuring the Container
- Logging Console Output
- Developing Servlets
- Deploying Servlets
- Introduction to Web Applications
- Chapter Summary

5. Programming Servlets

- Programming Servlets
- Servlet Lifecycle
- Servlet Lifecycle, cont'd
- Servlet Lifecycle, cont'd
- Servlet Class Diagram
- The Servlet Interface
- The ServletConfig Interface
- The GenericServlet Abstract Class
- The HttpServlet Abstract Class
- Initialization
- Termination
- Processing Requests
- The HttpServletRequest Interface
- Get versus Post
- Accessing Client Arguments
- Accessing Client Arguments, cont'd
- Accessing Client Arguments, cont'd
- Accessing Client Arguments, cont'd
- The HttpServletResponse Class
- Setting the Content Type
- Obtaining an Output Stream

- Generating Output
- Using HTML Forms
- Servlet Example: The HTML Form
- Servlet Example: The Desired Output
- Servlet Example: The Servlet
- Servlet Example: The Servlet, cont'd
- Accessing the Request Headers
- Accessing Headers: Example
- Access Headers: Example, cont'd
- User Agent Strings
- Output Buffering
- Using StringBuffer instead of Strings
- Servlet Instances and Multithreading
- Servlet Multithreading, cont'd
- Chapter Summary

6. Web Applications

- Web Applications
- What is a Web Application?
- Web Application Directory Structure
- The URL for the Web Application
- The Deployment Descriptor
- Packaging the Web App into a .war File
- Deploying the Web Application
- The Servlet Context
- Chapter Summary

7. Sessions

- Sessions
- HTTP is a Stateless Protocol
- What is a Session?
- Remembering State
- The Servlet Session API

- How Does the Session API Work?
- The Servlet Session API, cont'd
- The Servlet Session API, cont'd
- Creating or Retrieving a Session
- Saving State in a Session
- Retrieving State from a Session
- Configuring Sessions
- Using URL Rewriting
- Using URL Rewriting, cont'd
- Using Cookies Explicitly
- Cookie Example: Setting a Cookie
- Cookie Example: Retrieving a Cookie
- Chapter Summary

8. JDBC Programming

- JDBC Programming
- Database Fundamentals
- Introduction to ODBC
- Introduction to JDBC
- What Can You Do with JDBC?
- JDBC History
- Connection Pools
- JDBC URLs
- SQL Exceptions
- The JDBC API for Data Sources
- Configuring a Datasource, JDBC 2.x
- Locating a Datasource, JDBC 2.x
- Opening a Connection, JDBC 2.x
- The JDBC API for Connections
- The JDBC API for Statements
- Executing a Simple Query
- Processing a ResultSet
- SQL Types and Java Types

- Processing a ResultSet, cont'd
- Closing a Connection
- Inserting a Record
- Updating a Record
- Removing a Record
- Using Prepared Statements
- Using Prepared Statements, cont'd
- Chapter Summary

9. Introduction to JavaServer Pages

- Introduction to JavaServer Pages
- What is CGI?
- A Sample Perl CGI Script
- What's Wrong with CGI?
- CGI Enhancements and Alternatives
- Microsoft's ASP
- A Sample ASP
- What is Java2 Enterprise Edition?
- Introduction to Servlets
- Why Use Servlets?
- Writing a Servlet
- A Simple Servlet
- A Simple Servlet, cont'd
- Generating HTML in a Servlet
- Introduction to JavaServer Pages
- Why Use JSPs?
- JSP Compilation
- JSP Version History
- Model 1 versus Model 2
- Intro to the JSP Expression Language
- Chapter Summary

10. JSP Syntax

- JSP Syntax
- Introduction to Web Applications
- Introduction to Model-View-Controller
- A JSP Consists Of...
- Quoting and Escapes
- Template Data
- A JSP Consists Of...
- JSP Comments
- A JSP Consists Of...
- Element Syntax
- What is a Directive?
- The page Directive
- The page Directive, cont'd
- The page Directive, cont'd
- The include Directive
- The taglib Directive
- A JSP Consists Of...
- Writing Scriptlets
- JSP Expressions
- A JSP Consists Of...
- What is an Action Element?
- Standard Action Elements
- Exceptions and Error Pages
- Exceptions and Error Pages, cont'd
- Chapter Summary

11. JavaBeans and JSPs

- JavaBeans and JSPs
- Separating Content from Presentation
- The Model-View-Controller Architecture
- What is a JavaBean?
- Using JavaBeans with JSPs
- JavaBeans vs Enterprise JavaBeans

- JavaBean Requirements
- JavaBean Features
- What are Reflection and Introspection?
- What is a Property?
- What is a JavaBean Method?
- A Sample JavaBean
- A Sample JavaBean, cont'd
- A Sample JavaBean, cont'd
- A Sample JavaBean, cont'd
- Using a JavaBean from a JSP
- Bean Scopes
- Referencing a Bean
- The useBean Action Syntax
- The useBean Action Flowchart
- Setting Properties
- Setting Properties from the Request
- Setting Properties from the Request, cont'd
- Retrieving Properties
- Property Type Conversion
- Calling Methods
- Chapter Summary

12. Databases and JSPs

- Databases and JSPs
- JSPs and Databases
- Introduction to JDBC
- JSP Database Strategies
- JDBC and MVC
- Using a JavaBean for Database Access
- JDBC Basics
- Loading the JDBC Driver
- Connecting to a Data Source
- Executing a Query

- Processing a ResultSet
- Cleaning Up
- JDBC Performance Issues
- Connection Pooling
- Chapter Summary

13. Sessions and JSPs

- Sessions and JSPs
- HTTP is a Stateless Protocol
- What is a Session?
- Remembering State
- The Session API
- Sessions and the JSP Expression Language
- The useBean Tag and Sessions
- The useBean Tag and Sessions, cont'd
- The useBean Action Flowchart
- The session Implicit Variable
- Configuring Sessions
- Using URL Rewriting
- Using URL Rewriting, cont'd
- JSTL c:url Action
- Chapter Summary

14. Java Standard Tag Library

- JSP Standard Tag Library
- Custom JSP Actions - Tag Libraries
- Uses of Custom Actions
- Custom Actions vs JavaBeans
- Using a Tag Library
- The JSP Standard Tag Library
- Categories of JSTL Tags
- Introduction to Expression Languages
- JSTL Expression Syntax

- JSTL Operators
- Accessing Variables
- JSTL EL Implicit Objects
- Example: Accessing Form Data
- Core Tags
- Core Tags: The c:out Tag
- Core Tags: The c:if Tag
- c:if Tag Example
- Core Tags: c:choose, c:when, c:otherwise
- c:choose Example
- Core Tags: The c:forEach Tag
- c:forEach Tag Example
- c:forEach Tag Example 2
- Core Tags: The c:set Tag
- c:set Example
- Other Core Tags
- Formatting Tags Overview
- Database Tags Overview
- Database Tag Example
- XML Tags Overview
- XML Tags Example
- Chapter Summary

15. Custom Tag Libraries

- Custom Tag Libraries
- Custom JSP Actions - Tag Libraries
- Custom Actions vs JavaBeans
- Categories of Custom Actions
- Developing a Custom Action
- Processing for a Simple Custom Action
- Tag Interface Hierarchy
- Tag Class Hierarchy
- Sample Tag #1: Hello, World

- Sample Tag #1 Java Class
- Sample Tag #1 Java Class, cont'd
- Sample Tag #1 Java Class, cont'd
- Sample Tag #1 TLD
- Sample Tag #2: Using Tag Attributes
- Sample Tag #2 Java Class
- Sample Tag #2 Java Class, cont'd
- Sample Tag #2 TLD
- The PageContext Class
- Chapter Summary

16. Combining Servlets and JSPs

- Combining Servlets and JSPs
- Servlets versus JSPs
- Combining Servlets and JSPs
- What is the MVC Architecture?
- MVC and Web Applications
- MVC Tradeoffs
- Transferring Control
- Forwarding Requests
- Forwarding Requests, cont'd
- Redirecting Requests
- Redirecting Requests, cont'd
- MVC Example: Student Information System
- MVC Example User Interface
- MVC Example User Interface, cont'd
- The Find Student HTML
- The List All Students HTML
- The Controller Servlet
- The Display Student JSP
- Deploying the Web Application
- Chapter Summary

17. Introduction to Struts

- Introduction to Struts
- What is Apache Struts?
- Struts Architecture Highlights
- A Simple Request
- A Closer Look at ActionForm and Action
- ActionForm and Action Inheritance
- Development Steps
- Struts Custom Actions for HTML Forms
- Writing a Struts HTML Form
- Writing an ActionForm Class
- ActionForm Example
- ActionForm Example, cont'd
- Writing an Action
- Forwarding After an Action
- Action Example
- Action Example, cont'd
- The struts-config.xml File
- struts-config.xml Example
- struts-config.xml Example, cont'd
- Chapter Summary