Advanced Java Programming and Web Technologies

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical /Practice		
Advanced Java Programming and Web Technologies	4	3	0	1	Class XII Pass	NA

COURSE OBJECTIVE

- To provide an in-depth understanding of Swing and MVC architecture for building user interfaces in Java applications.
- To enable students to perform database connectivity and network programming using Java's java.sql and java.net packages.
- To introduce concepts of distributed systems with RMI and JNDI, including object serialization and internationalization.
- To familiarize students with J2EE architecture, enterprise applications, and server-side technologies such as Servlets.
- To equip students with the skills to develop dynamic web applications using JSP, Expression Language, and JSTL.

COURSE OUTCOMES

- On successful completion of the course, students will be able to
- Design and implement user interfaces using Swing and MVC architecture.
- They will demonstrate the ability to connect Java applications to databases and create network-based programs.
- Develop distributed applications using RMI and effectively use JNDI for naming services.
- They will gain proficiency in building enterprise-level web applications using J2EE, Servlets, and related technologies.
- To create dynamic, interactive web pages using JSP, Expression Language, and JSTL for real-world applications.

SYLLABUS

Unit 1: Introduction to Swing and MVC Architecture (6 Hours)
Swing, MVC Architecture, Text Fields, Buttons, Toggle Buttons, Checkboxes, Radio Buttons, Applets, Applications

Unit 2: Java Database Programming and Networking (7 Hours)
`java.sql` Package, JDBC Driver, Database Connectivity, `java.net` Package, Client Programs, Server Programs, Content Handlers, Protocol Handlers

Unit 3: Distributed Applications with RMI and JNDI **(7 Hours)**
RMI Architecture, RMI Registry, Distributed Applications with RMI, Naming Services, JNDI Overview, Object Serialization, Internationalization

Unit 4: J2EE Architecture and Web Applications **(6 Hours)**
J2EE Architecture, Enterprise Applications, n-Tier Applications, HTTP Protocol, Web Applications, Web Containers, Application Servers

Unit 5: Server-Side Programming with Java Servlet **(10 Hours)**
Java Servlet, HTTP Protocol, Servlet API, Servlet Life Cycle, Configuration and Context, Request and Response Objects, Session Handling, Event Handling, Filters, Writing Simple Filter Applications

Unit 6: JSP Programming **(9 Hours)**
JSP Architecture, JSP Life Cycle, JSP Elements, Expression Language, Tag Extensions, Core Tag Library (JSTL), XML Tag Library, SQL Tag Library, Functions Tag Library, JSP Fragments, Tag Files

REFERENCE BOOKS

1. Java6Programming,BlackBook,Dreamtech
2. JavaServerProgramming,JavaEE6(J2EE1.6),BlackBook,Dreamtech
3. AdvancedJavaTechnology,ByM.T.Savaliya,Dreamtech

PRACTICAL COMPONENT (IF ANY)

Practicals are based on any Java Compiler.

LIST OF PRACTICALS (30 Hours)

1. Design a simple Java application with Swing components like Text Fields, Buttons, Checkboxes, and Radio Buttons.
2. Implement a To-Do List application using the Model-View-Controller (MVC) pattern with Swing.
3. Create a Java program to connect to a MySQL database, perform basic CRUD operations (Create, Read, Update, Delete).
4. Develop a client-server program using Java's `java.net` package to create a simple chat application.
5. Write a Java RMI application where a client communicates with a remote server to fetch data and display it.
6. Implement RMI-based object serialization to transmit complex objects between a client and a server.
7. Create a basic web application using J2EE architecture and demonstrate interaction between the web browser and server.
8. Build a Java Servlet-based web application to manage user sessions (login/logout functionality).
9. Write a simple Java Servlet Filter to intercept HTTP requests and modify the request/response flow for logging or security purposes.
10. Design a dynamic web page using JSP, including the use of JSTL and Expression Language to display dynamic content from a database.