4. Handle HTML form, store the data in JSON object, pass them to another page and display it there using jQuery/Javascript

Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course
		Lecture	Tutorial	Practical/ Practice		
GE5c: Java Based Web App Development	**4**	**3**	**0**	**1**	Pass in Class XII	DSC 04 Object Oriented Programming with C++/ GE 1a Programming using C++ / GE1b Programming with Python/ DSC 01 Programming using Python/ GE 3b: Java Programming / A programming course at class XII level

Learning Objectives

The course aims to familiarize the students with the concepts and techniques of web app development based on Java. The students will learn about database connectivity, use of HTTP protocol, client side programming, and use of servlets and JSP for server side programming.

Learning outcomes

On successful completion of this course, students will be able to:

- develop an understand of client-server architecture, HTTP protocol, and web application components.
- connect an application to database and perform basic database operations.
- create servlets and JSP for web applications
- deploy web applications

SYLLABUS OF GE-5c

Unit 1 (8 hours)

Review of Programming Language: Programming Constructs, Data types, Operators, Concepts of Class, Interface, Inheritance, Exception Handling, Util package, Multithreading, event handling.

Unit 2 (10 hours)

Java Database Connections: Database connectivity, Connection, statement, result set object, Metadata, Connection pooling, CRUD operations, Prepared and callable statements

Unit 3 (15 hours)

Introduction to servlets: Concepts of Streams, events and listener, recap of HTML, CSS, XML, Servlet package and interface, life cycle of servlet, deployment descriptor, Filters, HHTP and Generic servlet, request dispatcher, Request Response classes, Dynamic page designing using servlet.

Unit 4 (12 hours)

Introduction to JSP: JSP Life cycle, tags in JSP, custom tags, Expression Language, Introduction to Struts Framework, Implicit objects, database access using JSP

Essential/recommended readings

1. Herbert Schildt, *Java : The Complete Reference*, 12th edition, McGraw-Hill Education, 2021.
2. Hans Bergsten, *Java Server Pages*, 3rd edition, O′Reilly, 2003.
3. Jim Keogh, *The Complete Reference J2EE*, 1st edition, McGraw-Hill Education, 2017.

Suggested Practical List : (30 Hours)

Practical exercises such as

1. Setting up the development environment: Install Java Development Kit (JDK), Eclipse IDE, and Apache Tomcat web server. Create a new web project in Eclipse.
2. Writing and deploying a "Hello World" servlet: Create a simple servlet that prints "Hello World" on the web page. Deploy the servlet on Tomcat and test it in a web browser.
3. Handling HTTP requests and responses: Write a servlet that reads input from HTTP requests and sends output as HTTP responses.
4. Creating a JSP page: Create a JSP page that displays dynamic.
5. Write a servlet that handles form submissions and saves the data to a database using JDBC.
6. Write a servlet that implements user authentication and authorization using a database.
7. Creating a web application using MVC architecture: Create a web application using Model-View-Controller (MVC) architecture. Use servlets as controllers, JSP pages as views.
8. Deploying a web application to a server: Configure and deploy a web application to a server using Apache Tomcat Manager or other deployment tools.