

20PECE 501LB Java Full Stack Technologies Laboratory

Teaching Scheme

Practical: 2 Hrs/week

Examination Scheme

In Semester: 25 Marks

Oral : 25 Marks

Credits: 1

Course Objectives:

To facilitate the learners to -

1. Understand the Installation and Configuration setting related aspects of web server, integrated development environments and various frameworks, in the development of web applications.
2. Understand the role of various technologies used for real-life application development.
3. Get exposure to full stack development in Java which includes client side and server side technologies, web services and database development technologies.
4. Gain practical knowledge about the various client side and Java server side technologies for application development in practice.

Course Outcomes:

By taking this course, the learner will be able to -

1. Make use of suitable client side Java technologies.
2. Experiment with various Java server side technologies like Java Servlets, Java Server Pages, Web services and JPA for web application development.
3. Make use of Java Sockets library and Java RMI framework for the development of sample client-server applications.
4. Build a sample web application using suitable technologies at various tiers.

Preamble:

Development of web applications need technologies at various levels, which play different roles in the overall web architecture. The intent of Java Full Stack Technologies Laboratory is to enable the understanding of the role of various technologies in full stack development and implementation of some real world application scenarios using these technologies. Assignment statements are in brief and should be implemented with Java web technologies. Motivation here is that students should be able to develop the user interface, business logic and the database programming parts of a typical web application, using the APIs/libraries provided by various client side and server side Java technologies. Faculty members are encouraged to expand problem statements with variations. Assignments can be framed and expanded in such a way that it explores concepts, logic of solution and simple application. Students will be encouraged to build solutions for real world business scenarios in different domains, to fulfil the end-user requirements. Faculty will appropriately adopt assignments on similar lines as the examples shown here. Group A assignments are on applying

various client side technologies and basic server side technologies. Group B assignments are on exploring the use of technologies like EJB, Web services and Hibernate. Group C assignment is on the development of sample web application.

Suggestive List of Assignments:

Group A: (Mandatory)

1. Develop dynamic and interactive web client using HTML, CSS and JavaScript technologies. Make use of these technologies to develop suitable web forms, layout and to perform validation of form data, for this web client.

Sample application scenario:

Consider that a student needs to register for an online course portal. For this scenario, develop an HTML form for "Course Registration", make use of CSS for layout design of this form and perform validation on various fields of this form using JavaScript.

2. Develop dynamic and interactive web client using XML and AJAX technologies, to enable rich user experience.

Sample application scenario for AJAX:

Consider a web form for an administrator of an "Online Shopping Application". An administrator can select the name of a customer from the drop down list box on the web form. Then on the same page, the details of the customer such as shipping address should get displayed.

3. Develop dynamic and interactive web client using jQuery as a client side JavaScript library. For this web client, implement event handling and animation effects using jQuery.
4. Develop dynamic and interactive web client using ReactJS as a client side library. Make use of various features of ReactJS such as components, APIs etc.
5. Implement a simple client-server application like echo server or chat server using Java Sockets. Make use of multithreading in Java for handling the requests from multiple clients.
6. Implement an application using Java RMI to understand distributed application environment. The remote object accesses database using JDBC.
7. Implement a sample web application scenario using Java Servlets, Java Server Pages and Java Beans as the server side dynamic content generation technologies. Make use of MVC architecture for this implementation and also show the appropriate usage of the various capabilities of these technologies such as session tracking, tag library, implicit objects, directives etc.

Sample application scenario:

Consider a simple web form where you give Student Roll number and get back Student Profile details from the database. Make use of MVC architecture, based on Java Servlet, JSP and Java Bean to implement this web based scenario.

Group B: (Any One)

1. Implement a sample EJB based scenario for any application like online movie ticket booking, online college admission portal, online railway reservation etc. Make use of various types of beans such as session beans and entity beans, for the implementation of business methods and persistence of data.
2. For a sample application scenario, implement and consume the suitable web services using SOAP or REST protocol.
3. Make use of JPA with Hibernate framework for performing the create, retrieve, update and delete (CRUD) operations on the backend database.

Sample application scenario:

Consider "Course Information Management" as a typical Database Application. This application may have database tables like Courses, Participants etc. Make use of JPA with Hibernate framework to access the data from the Courses table in this above application.

Group C:

1. Design and develop a typical web application like online cab booking, online food ordering application, online tours and travel portal etc. For the development of this application, choose the appropriate technologies for the client side aspects, server side business logic and database development.