

Guided Assignment Workshop: Modern Enterprise Application Development

 **Assignment Title: Developing a Modern Enterprise Application Using Contemporary Tech Stack**

 **Target Audience: Undergraduate Students (3rd/4th Year - IT, SE, CS)**

 **Objective:**

To build a modern enterprise-level web application by leveraging widely adopted modern technologies. This assignment replaces traditional Java EE technologies like Servlets, JSP, and EJBs with updated, scalable, and developer-friendly solutions.

Modern Tech Stack Overview

Legacy Technology	Modern Equivalent
Servlets	REST APIs using Spring Boot
JSP	React.js or Angular for frontend
EJB	Spring Boot Services or Microservices (with Spring Data JPA)
XML Config	YAML / Annotations
SOAP Web Services	RESTful Web Services (JSON)
Application Server	Embedded Tomcat / Docker
JDBC	Spring Data JPA / Hibernate

Project Theme: University Course Management System

Build a system to manage course offerings, student registrations, and results.

Assignment Deliverables

1. Functional Web Application (Backend + Frontend)
2. Source Code with GitHub Link
3. Deployment Instructions
4. Project Report (PDF)

Step-by-Step Workshop Guide

Step 1: Set Up the Environment

- Install JDK 17
- Install Node.js (v16+)
- Install Spring Boot CLI or use Spring Initializr
- Use VS Code or IntelliJ IDEA
- Install Docker Desktop (optional)

Step 2: Backend - Spring Boot Application

- a. Create a Spring Boot App using <https://start.spring.io/>
- b. Define the Entities:

```
``java
@Entity
public class Course {
    @Id @GeneratedValue
    private Long id;
    private String title;
    private String code;
}
...`
```
- c. Create Repositories:

```
``java
@Repository
public interface CourseRepository extends JpaRepository<Course, Long> {}
...`
```
- d. Build REST Controllers:

```
``java
@RestController
@RequestMapping("/api/courses")
public class CourseController {
    @Autowired
    private CourseRepository repo;

    @GetMapping
    public List<Course> getAll() {
        return repo.findAll();
    }
}
...`
```
- e. Run the Backend and test: ``http://localhost:8080/api/courses``

Step 3: Frontend - React.js App

- a. Create App:
 - `bash`

```
npx create-react-app course-management-ui
cd course-management-ui
npm start
```
- b. Fetch Data from Backend:
 - `javascript`

```
useEffect(() => {
  fetch("http://localhost:8080/api/courses")
    .then(res => res.json())
    .then(data => setCourses(data));
}, []);
```
- c. Display in Table:
 - `jsx`

```
<table>
  <thead><tr><th>Code</th><th>Title</th></tr></thead>
  <tbody>
    {courses.map(c => <tr key={c.id}><td>{c.code}</td><td>{c.title}</td></tr>)}
  </tbody>
</table>
```

Step 4: Connect to MySQL (Optional)

- Use Docker to start MySQL:
 - `bash`

```
docker run -d -p 3306:3306 --name mysql -e MYSQL_ROOT_PASSWORD=root mysql
```
- Update `application.yml` with datasource config

Step 5: Deployment

- Use Dockerfile to containerize
- Host on Render / Heroku / Railway

△ Evaluation Criteria

Area	Marks
Functionality	30
Code Quality	20
Modern Tech Adoption	20
UI/UX Design	10
Documentation & Report	20

Summary

This workshop helps to experience the modern enterprise application development by implementing a full-stack project using Spring Boot and React. By replacing legacy technologies, students gain hands-on knowledge relevant to today's job market.

End of Workshop