Software Design and Engineering

Lab Document

High Level Purpose Statement:	I want to develop a prototype for an optimized course scheduling system to help students graduate on time. My focus is on setting up a backend using Spring Boot with a PostgreSQL database and creating a RESTful API.
Experimental Design:	I will start by creating a Spring Boot project in IntelliJ, configuring it with the necessary dependencies, and setting up PostgreSQL. Then, I will design a basic course entity, implement a repository for data access, and build a service layer to handle logic. Finally, I will create a controller to expose RESTful endpoints. **Steps:** 1. Set up a Spring Boot project with Maven. 2. Configure PostgreSQL and connect it to the application. 3. Create a model to represent courses. 4. Implement a repository for database interaction. 5. Develop a service layer to manage business logic. 6. Build a RESTful API to expose course data. 7. Run and test the application using Postman and/or normal Browser
Resources Available:	I will use Spring Boot, PostgreSQL, Maven, and online documentation, along with YouTube tutorials.
Time Estimate:	I expect to spend about 10 hours, including setting up the project, learning Maven, and testing the implementation.
Experiment Notes:	Setting up the project in IntelliJ was straightforward using the Spring Initializr. PostgreSQL configuration required careful attention to database credentials and connection settings. Implementing the repository pattern helped simplify database interactions. Testing with Postman confirmed that the API endpoints were working as expected. Encountered minor issues with dependency management in Maven, which I resolved by updating the pom.xml file. Future improvements will include optimizing queries for better performance and integrating authentication.
Results:	I will document my findings after testing and validating the prototype.
Consequences for the Future:	This project lays the groundwork for a more advanced scheduling system. Future improvements will include integrating a frontend with React and enhancing the scheduling logic.