

System Design Document

Student Academic Portal

1. Introduction

The Student Academic Portal is a full-stack web application designed to act as a one-stop portal for academic information. It centralizes results, timetables, and announcements into a single structured user interface. The system uses a React frontend, Spring Boot backend, and PostgreSQL database.

2. System Requirements

2.1 Functional Requirements

Secure Login: Students can register and log in securely.

Academic Results: Students can view grades and performance history.

Timetable Management: Students can view daily and weekly schedules.

Notice Board: Admin-controlled notices are visible to all students.

2.2 Non-Functional Requirements

Scalability: Supports multiple concurrent users.

Data Integrity: PostgreSQL ensures consistent academic records.

Security: JWT-based authentication for secure sessions.

3. Module Division (8 Modules)

Frontend Modules (React)

Module 1: Authentication & Profile UI – Login, registration, profiles.

Module 2: Academic Dashboard UI – View results and transcripts.

Module 3: Info & Announcements UI – Timetables and notices.

Backend Modules (Spring Boot)

Module 4: Identity Management – Registration and JWT login APIs.

Module 5: Result Management Service – Manage student grades.

Module 6: Timetable Service – Class schedule logic.

Module 7: Announcement Service – Admin notices and history.

Module 8: Database & Persistence Layer – PostgreSQL schema and indexing.

4. High-Level Design (HLD)

Architecture: Client-Server model.

Communication: REST APIs between React and Spring Boot.

Storage: PostgreSQL database for persistence.

5. Low-Level Design (LLD)

5.1 Database Design (PostgreSQL)

Student Table: userId, name, email, password, department.

Result Table: resultId, userId, courseCode, grade, semester.

Timetable Table: scheduleId, courseName, timeSlot, room.

5.2 API Design

POST /api/auth/login – User authentication.

GET /api/student/results – Retrieve grades.

GET /api/announcements/summary – Fetch notices.

6. Future Enhancements

Export reports as PDF/Excel.

AI-based academic recommendations.

Native mobile application support.