WEEK 4

BACKEND ARCHITECTURE AND DATABASE DESIGN DOCUMENTATION

1. AIM

The aim of this project is to develop a digitalized system for One Credit Course Registration and Course Exemption to automate student registration, attendance tracking, and course exemption verification using a MERN (MongoDB, Express.js, React.js, Node.js) stack application.

2. OBJECTIVES

- Implement a user-friendly interface for students to register for one-credit courses.
- Develop an automated attendance tracking system to minimize manual errors.
- Enable students to submit course exemption requests based on eligibility.
- Provide role-based access for students, faculty, and administrators.
- Ensure seamless integration with institutional databases.
- Design a scalable and secure backend architecture.

3. SCOPE

- The system will support students, faculty, and administrators.
- It will allow real-time attendance tracking and generate reports.
- Automated course exemption validation will reduce manual workload.

- Integration with existing institutional databases for seamless data exchange.
- The platform will be scalable to accommodate future expansion.

4. WORK DONE

- Finalized Backend Architecture:
    - Designed a RESTful API using Node.js & Express.js.
    - Implemented authentication using JWT.
- Database Setup:
    - Created MongoDB collections for students, courses, attendance, and exemptions.
    - Defined database schemas using Mongoose ORM.
- Frontend & Backend Connection:
    - Developed API endpoints for student login and registration.
    - Integrated React.js frontend with backend using Axios.
    - Implemented React Router for navigation.
- Deployment Considerations:
    - Hosted MongoDB database on MongoDB Atlas.
    - Planned backend deployment using Render/Vercel/AWS.
    - CI/CD pipeline setup under consideration.