Register their Department Course and their individual Electives and Add on courses

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Project ID	18
Problem Statement	Course Registration Portal

PROBLEM STATEMENT:

Title: Development of a Course Registration Portal for College Using MERN Stack

Objective:

To develop a web-based course registration platform for students in your college, utilizing the MERN (MongoDB, Express.js, React, Node.js) stack. The platform will streamline the process of course registration by providing a user-friendly interface for students to log in, select their academic regulation, department, and semester, and then register for the eligible courses.

PROJECT-FLOW:

PURPOSE OF THE PROJECT:

The purpose of this project is to develop a comprehensive course registration platform for college students, utilizing the MERN stack (MongoDB, Express.js, React, Node.js). The platform aims to streamline the course registration process by providing a user-friendly interface where students can log in, select their academic regulation, department, and semester, and then view and register for eligible courses, including elective options. By digitizing this process, the platform seeks to eliminate the inefficiencies and errors associated with manual course registration, ensuring a smooth and efficient experience for students. Additionally, the platform aims to enhance data security and integrity, facilitate easy access to course information, and offer scalability

to accommodate future growth. Ultimately, this project endeavors to modernize and improve the academic administrative processes within the college.

BUSINESS CONTEXT:

In the current educational landscape, efficient administrative processes are critical for enhancing student satisfaction and institutional effectiveness. The proposed course registration platform addresses the challenges associated with manual and outdated registration systems, which often lead to errors, inefficiencies, and frustration among students. By implementing a digital solution using the MERN stack, this project aims to streamline the course registration process, ensuring a seamless and user-friendly experience for students.

From a business perspective, the platform not only improves operational efficiency but also enhances data accuracy and accessibility, thereby reducing administrative overhead. Additionally, it positions the college as a technologically advanced institution, attracting prospective students and faculty who value modern, efficient systems. By automating course registration, the platform also allows staff to focus on more strategic tasks, contributing to overall institutional productivity. In the long term, the platform supports scalability and adaptability, accommodating future growth and changes in academic regulations and curricula. This project represents a significant step towards digital transformation, aligning with the broader goals of innovation and excellence in education.

CONSIDERATION:

- Robust Data security
- User authentication to protect sensitive information
- Scalability
- User-friendly and accessible
- Performance optimization
- Integration with existing college systems
- Comprehensive testing and user feedback

DEPENDENCIES:

- **Frontend Dependencies:**
  - **React**: For building the user interface.
- **Backend Dependencies:**
  - **Node.js**: For server-side JavaScript runtime.

- **Express.js**: For building the RESTful API.

- **Database Dependencies:**

  - **MongoDB**: For the database to store user credentials, course details, and registration data.

USER PERSONAS:

1. Student:

- **Name:** Alex Patel
- **Age:** 20
- **Occupation:** Undergraduate Student
- **Technology Proficiency:** Moderate
- **Goals:**
  - Easily log in and access the course registration platform.
  - Quickly find and register for eligible courses each semester.
  - View and manage registered courses.
  - Ensure the selected courses meet graduation requirements.
- **Frustrations:**
  - Confusion with manual registration processes.
  - Lack of clarity on available and required courses.
  - Difficulty tracking elective courses and meeting their criteria.

2. Academic Advisor:

- **Name:** Dr. Sarah Johnson
- **Age:** 45
- **Occupation:** Academic Advisor
- **Technology Proficiency:** High
- **Goals:**
  - Assist students in selecting appropriate courses.
  - Access and review students' registered courses.
  - Provide guidance on elective choices and course prerequisites.
  - Ensure students are on track for graduation requirements.
- **Frustrations:**
  - Inefficiencies in accessing students' registration data.
  - Difficulty in verifying course eligibility manually.
  - Time-consuming processes to update and manage course lists.

3. Administrator:

- **Name:** Michael Lee
- **Age:** 35
- **Occupation:** College Administrator
- **Technology Proficiency:** High
- **Goals:**
    - Manage and update course offerings for each department and semester.
    - Ensure data integrity and security for student information.
    - Monitor and report on registration statistics and trends.
    - Facilitate smooth operation and scalability of the platform.
- **Frustrations:**
    - Challenges in maintaining up-to-date course information.
    - Ensuring data security and compliance with regulations.
    - Handling large volumes of registration data efficiently.

4. IT Support Specialist:

- **Name:** Jamie Nguyen
- **Age:** 30
- **Occupation:** IT Support Specialist
- **Technology Proficiency:** Expert
- **Goals:**
    - Ensure the platform is running smoothly and efficiently.
    - Troubleshoot and resolve technical issues.
    - Implement security measures to protect user data.
    - Assist in integrating the platform with existing college systems.
- **Frustrations:**
    - Dealing with unexpected technical glitches.
    - Ensuring seamless integration with other systems.
    - Keeping up with security threats and vulnerabilities.

FUNCTIONAL REQUIREMENTS:

- **User Authentication:**

    - Implement a secure login system where students can log in using their college email ID and password.

- Ensure password hashing and secure storage of user credentials.

- **Regulation Selection:**

  - After logging in, students must select their academic regulation (e.g., 2018, 2021, 2022, 2024).

- **Department and Semester Selection:**

  - Students should choose their department (e.g., Computer Science, Mechanical Engineering, etc.).
  - Students must select their current semester.

- **Course Display:**

  - Based on the selected regulation, department, and semester, display a list of eligible courses for the student.
  - Include elective courses if they are part of the selected semester's curriculum.

- **Course Registration:**

  - Allow students to register for the selected courses.
  - Add the registered courses to a section called "Registered Courses".

- **User Interface:**

  - Develop a responsive and intuitive user interface using React.
  - Ensure the platform is accessible and easy to navigate for students.

- **Backend and Database:**

  - Use Node.js and Express.js to build the backend server.
  - Implement a MongoDB database to store user credentials, course details, and registration data.
  - Ensure data integrity and security.

NON-FUNCTIONAL REQUIREMENTS:

- **Performance:**

  - The platform should handle multiple concurrent users efficiently.
  - Optimize database queries and server responses for quick load times.

- **Security:**

- Implement robust authentication and authorization mechanisms.
- Ensure secure data transmission using HTTPS.

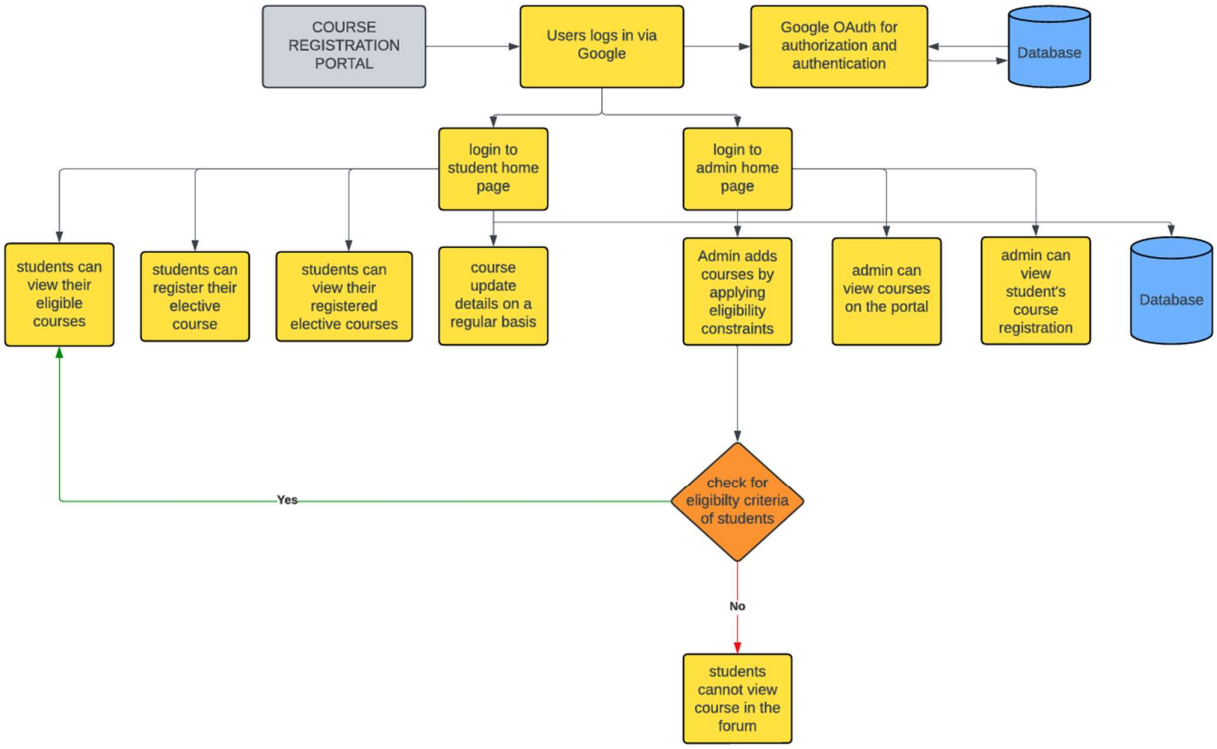
- **Scalability:**

  - Design the system to be easily scalable to accommodate future growth in the number of users and courses.

- **Usability:**

  - Provide clear instructions and feedback to users throughout the registration process.
  - Ensure compatibility across different browsers and devices.

FLOWCHART:


COURSE REGISTRATION PORTAL
Users logs in via Google
Google OAuth for authorization and authentication
Database
login to student home page
login to admin home page
students can view their eligible courses
students can register their elective course
students can view their registered elective courses
course update details on a regular basis
Admin adds courses by applying eligibility constraints
admin can view courses on the portal
admin can view student's course registration
Database
check for eligibilty criteria of students
Yes
No
students cannot view course in the forum