TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
PULCHOWK CAMPUS

A REPORT ON SOFTWARE PROJECT:

SYLLABUS VERSION MANAGEMENT

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Acknowledgement

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We would also like to thank the Department of Electronics and Computer Engineering, Pulchowk Campus for providing the opportunity to work on this project which helped strengthen concepts in software development, understand the workflow of the project, utilize what we had learned and provided an experience of collaboration and teamwork.

Abstract

This project was made for the fulfillment of a Software Engineering Lab in the 5th semester of our program. In this project we use the popular MERN stack to create a website for easy viewing and management of subjects in every semester in the curriculum. This project has features like user authentication, creating and editing subjects and managing different versions of the subject.

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Introduction

In today's fast-paced educational landscape, staying organized and informed about course content is essential for students and educators alike. The MERN (MongoDB, Express.js, React, and Node.js) stack provides an ideal framework for developing modern, responsive, and user-friendly web applications. In response to the growing need for efficient syllabus management, we proudly present our MERN stack Syllabus Viewing and Version Management Application.

Objectives

The primary objectives of this project include:

Syllabus Management: Implementing necessary functionality to add subjects in different semesters of different programs and edit those subjects as deemed necessary.

Version Management: Implementing a feature to store and view detailed description of subjects in different versions.

Methodology and Stack Used

The MERN stack is a popular and powerful web development stack that encompasses a set of technologies and tools for building modern web applications. MERN is an acronym that stands for MongoDB, Express.js, React, and Node.js, and it represents a full-stack solution for creating dynamic and feature-rich web applications. Each component of the stack plays a specific role in the development process:

MongoDB: MongoDB is a NoSQL database that is used for storing and managing data in a flexible, JSON-like format. It is known for its scalability, speed, and ability to handle large volumes of data. MongoDB is particularly well-suited for applications that require a high degree of flexibility in their data models.

Express.js: Express.js is a lightweight and flexible web application framework for Node.js. It simplifies the process of building server-side applications by providing a range of tools and utilities for handling routes, middleware, and HTTP requests. Express.js makes it easier to create robust and scalable server-side components.

React: React is a JavaScript library for building user interfaces. It focuses on creating reusable and interactive UI components, making it easier to develop the frontend of web applications. React follows a component-based architecture, which promotes code reusability and maintainability. It also provides a virtual DOM for optimizing performance.

Node.js: Node.js is a server-side JavaScript runtime environment that allows developers to build server-side applications using JavaScript. It's known for its non-blocking, event-driven architecture, which makes it well-suited for building highly scalable and efficient backend services. Node.js can handle multiple concurrent connections without blocking, making it ideal for real-time applications.

The MERN stack is particularly popular for building single-page applications (SPAs) and is known for its flexibility, scalability, and the ability to create responsive and interactive web applications. Here's a brief overview of how the components of the MERN stack work together in our project:

- Node.js serves as the backend runtime environment, where we create APIs and handle server-side logic.

- Express.js is used to build the RESTful APIs or GraphQL endpoints that interact with the frontend and manage routing and middleware.

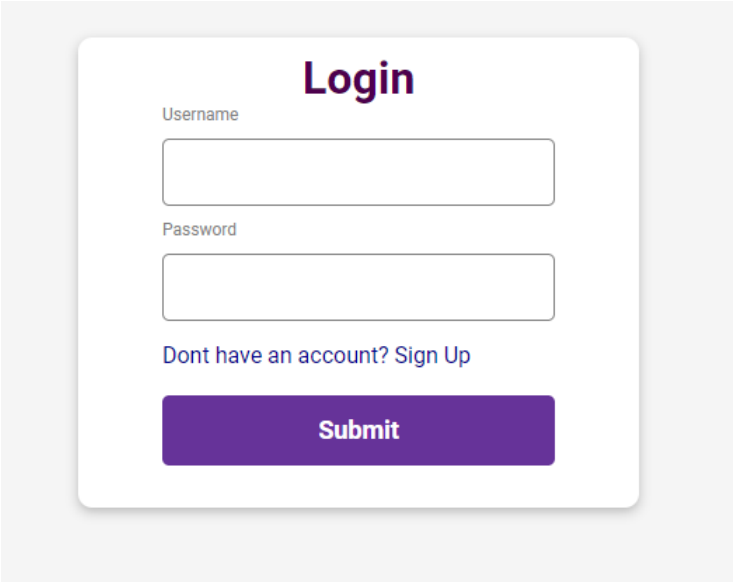
- React is responsible for creating various components and rendering the user interface, handling user interactions, and making requests to the backend via API calls.

- MongoDB stores and manages the application's data in a NoSQL format, allowing for flexible data modeling. We use Mongoose which is an elegant and powerful JavaScript library that provides an Object Data Modeling (ODM) layer for MongoDB. It simplifies the interaction between Node.js application and MongoDB, making it easier to work with MongoDB's data in a structured and organized way. In Mongoose, we defined a schema for Users, Programs and Subjects for each MongoDB collection. A schema specifies the fields, data types, and constraints for documents in that collection. It provides a blueprint for how data should be stored and retrieved.

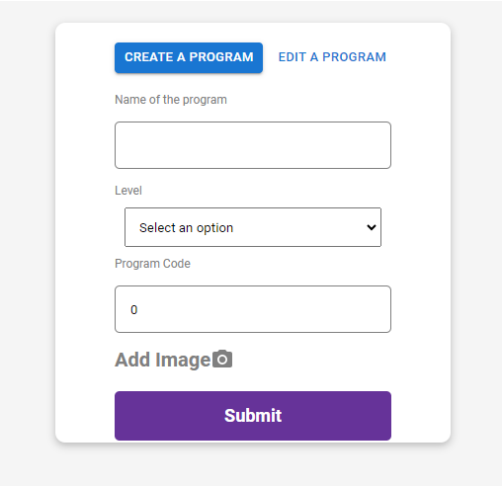
By combining these technologies, we created web applications that provide a seamless user experience to browse their curriculum.

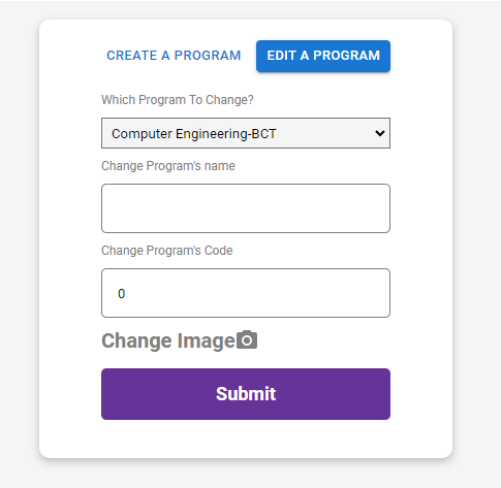
Features

1) User Authentication

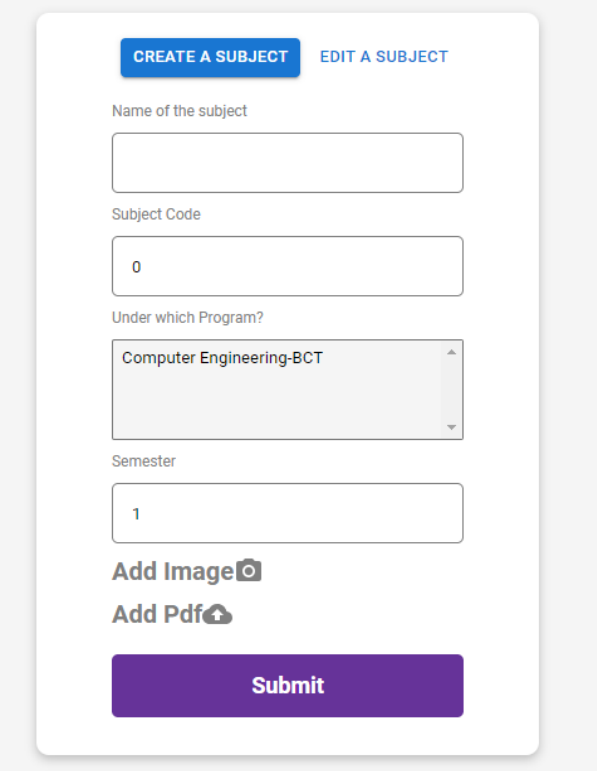


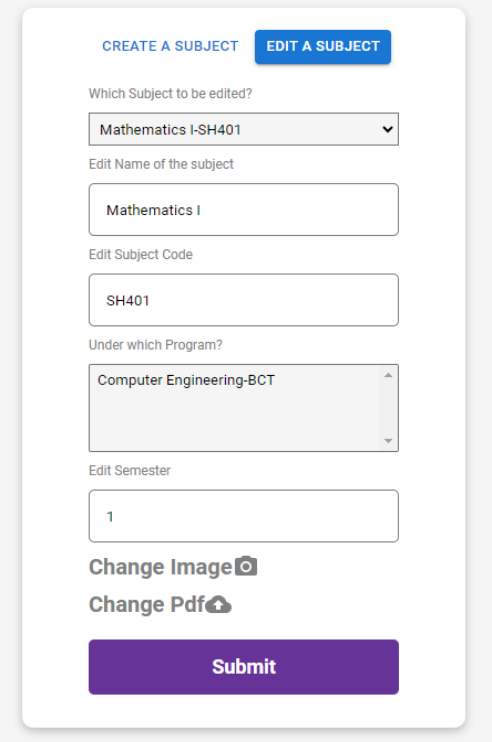
2) Create and Edit Programs



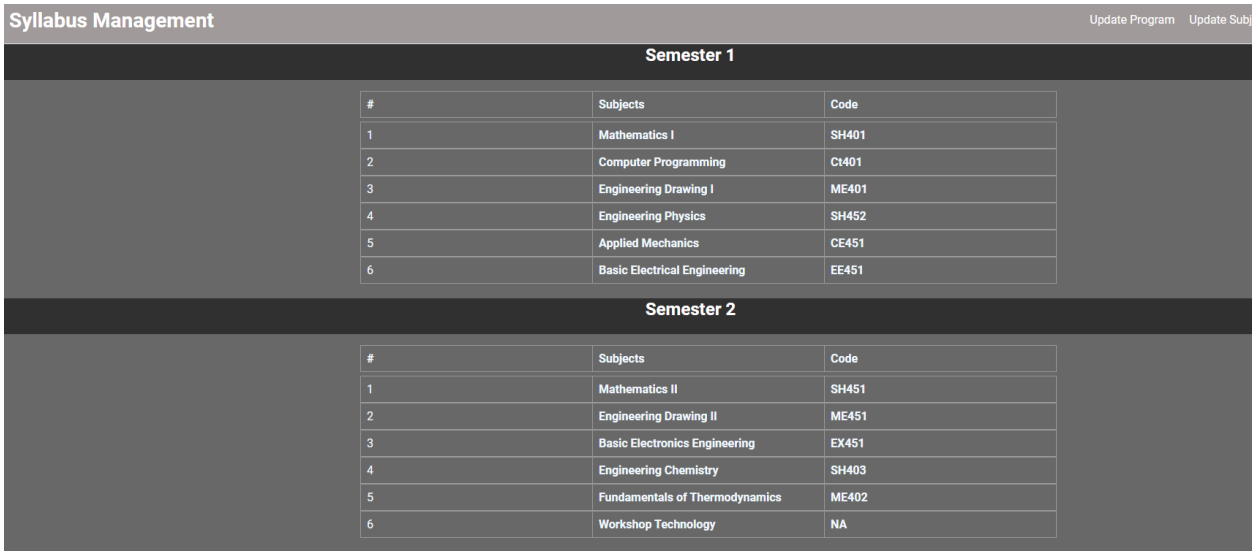


3) Create and Edit Subjects





4) Syllabus



5) Version Management

Versions

#	Date	Version Name	Open the Files
4	2023/10/25 10:10 AM	version-9	Click To Open
3	2023/00/25 06:00 AM	version-3	Click To Open
2	2023/59/25 05:59 AM	version-2	Click To Open
1	2023/44/25 05:44 AM	version-1	Click To Open

Problems Faced and Future Enhancement

We faced several problems while working on improving this project. Most of them are related to learning how to use each component of the MERN stack. To solve these problems we went through several documentations and tutorials on Youtube. For future enhancement we can improve the user interface design and deploy this project in the college server.

Conclusion

Finally, for the fulfillment of the Software Engineering Lab of our semester we provided necessary improvement to the Syllabus Version Management project. Being involved in this project was an excellent opportunity to collaborate with colleagues and learn some of the fundamentals of web development.