A Project Report On

E-School

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This Project report has been submitted in fulfilment of the requirements for the degree, Bachelor of Science in Software Engineering

APPROVAL

This project titled on "**E-School**", submitted by **Hiron Sarker (ID: 162-35-1655)** to the Department of Software Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Science in Software Engineering and approval as to its style and contents.

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Declaration

I hereby declare that I have done this project under the supervision of **Md. Hafizul Imran, Lecturer (Senior Scale),** Department of Software Engineering, Daffodil International University. I also declare that this project is my original work for the degree of B.Sc. in Software Engineering and neither the whole work nor any part of this project has been submitted for another degree in this or any other university.

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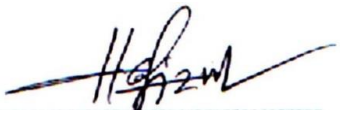

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Acknowledgement

First of all, I want to express my sincere thankfulness to God Almighty for giving me the courage and direction I needed to finish this endeavour. Next, I want to sincerely thank my supervisor, **Md. Hafizul Imran**, who is a **Lecturer (Senior Scale)** in the Daffodil International University Department of Software Engineering. His knowledge, steadfast assistance, and priceless advice were crucial in forming our idea. For his unwavering encouragement and support during this journey, I am also incredibly grateful to **Dr. Imran Mahmud, Associate Professor and Head** of the Software Engineering Department. I want to express my sincere gratitude to the distinguished faculty members of the Software Engineering Department for their support and encouragement. Last but not least, I would want to express my sincere gratitude to my parents, who have been the foundation of my strength with their unwavering love, care, and support.

Dedication

I therefore declare that I have done this project under the oversight of **"Md. Hafizul Imran", "Lecturer (Senior Scale)"** Department of Software Engineering, Daffodil International University. Also declare that neither entire record nor any portion of this record has been submitted somewhere else for my degree.

Abstract

‘E-School’ is an innovative web-based learning management system designed to revolutionize the tech education landscape. This project addresses the growing demand for accessible and comprehensive technology education by providing a platform where learners can engage in dynamic courses, collaborate with industry experts, and enhance their skills in a global learning community. Key features include a robust authentication system, user-friendly registration and profile management, seamless course enrollment and payment processing, and an interactive feedback mechanism. In addition, the platform empowers instructors to create, manage, and enrich courses with supplementary materials. Future developments aim to introduce collaborative tools such as chat rooms, a job posting board, and virtual events. With a commitment to continuous improvement, “E-School” is poised to become a dynamic hub for tech enthusiasts, learners, and industry professionals seeking a cutting-edge and inclusive learning experience.

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Chapter 1 - Introduction

1.1 Overview

In the quickly changing environment of technology and education, "E-School" emerges as a visionary project poised to redefine the learning experience. E-School is an innovative platform designed to provide a comprehensive and interactive educational environment, fostering the growth and development of individuals in the realm of technology and beyond. This program is motivated by a commitment to bridging the knowledge gap between academia and practical application, equipping students to succeed in a fast-paced, technologically advanced world.

1.2 Purpose

E-School's goal is to empower those who have the skills and knowledge necessary to thrive in the quickly changing technology industry. “E-School” wants to be a driving force behind professional and personal development by fusing top-notch instruction with a real-world, hands-on approach, building a community of tech-savvy people ready to have a big influence in their areas.

1.2.1 System Model

The system architecture can be simulated with the aid of this model. An effort was made to make it as user-friendly as feasible.

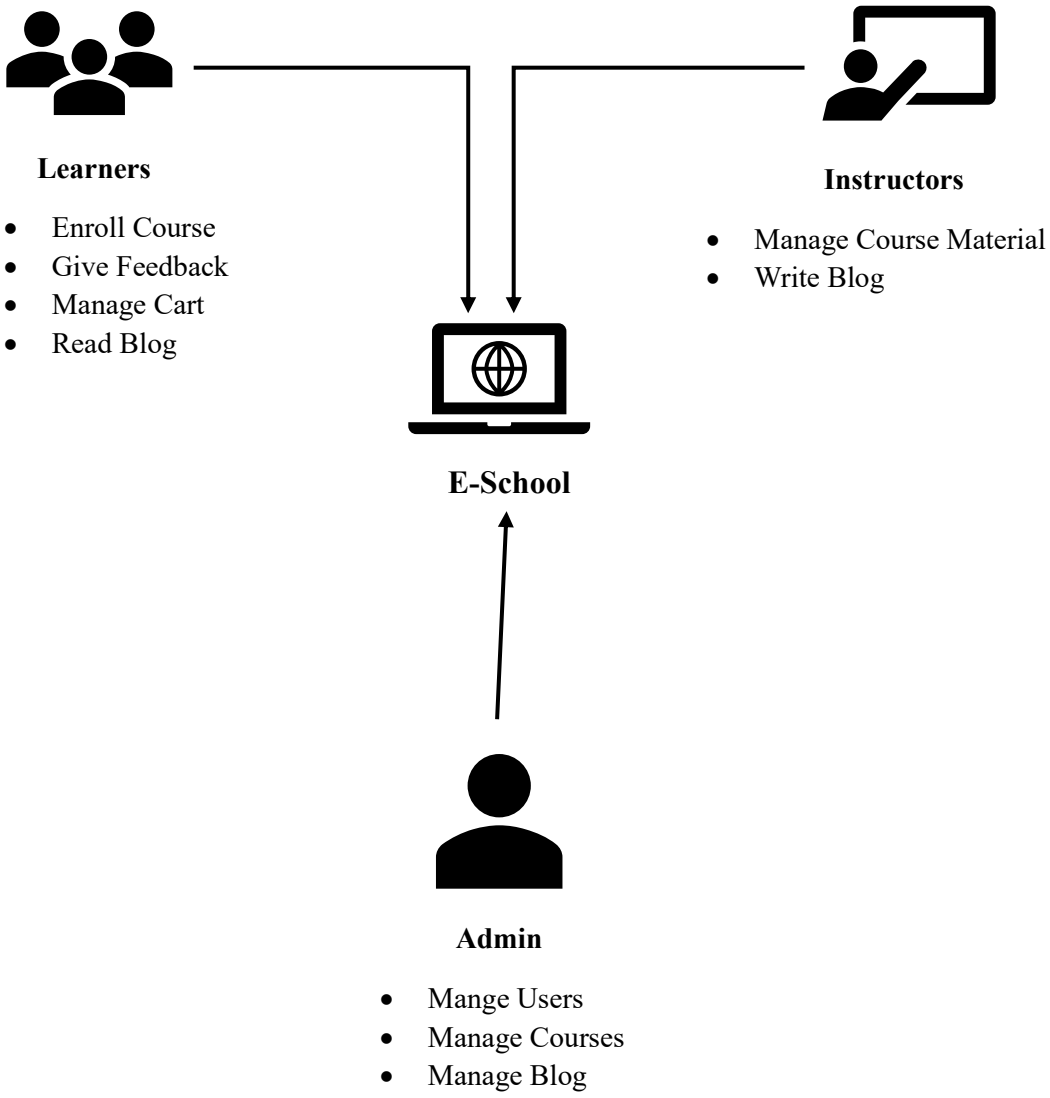

Figure 1.1 - Proposed system

1.3 Benefits

E-School emerges as a transformative force in education, delivering a myriad of benefits to a diverse range of beneficiaries. For learners, the platform serves as an empowering gateway to acquire relevant and practical tech skills, fostering not only professional growth but also a commitment to lifelong learning. Instructors find a platform to contribute their expertise, shaping the next generation of tech professionals while enhancing their own professional development. The project's commitment to accessible tech education extends its benefits globally, reaching learners irrespective of geographical constraints. The collaborative community cultivated by E-School enriches the learning experience for individuals seeking interaction, shared insights, and project collaboration. As learners worldwide access quality education, the platform becomes a catalyst for innovation, contributing to the ongoing advancement of the tech industry and benefiting businesses and society at large. E-School, with its inclusive and innovative approach, stands as a beacon of opportunity for tech enthusiasts, professionals, and the broader global community.

1.4 Problem Statement

In today's digital age, learning is taking place online more than ever before. But there's a challenge: existing online education systems are often complex and not user-friendly. Our website aims to solve this problem. We want to create an easy-to-use online learning platform for Learners, Instructors, and administrators. Our goal is to make learning online simple, engaging, and accessible to everyone. We believe that education should be interactive and enjoyable. With our project, we hope to provide a better way for people to access knowledge and connect with others in a global community of learners. Our mission is to make online learning a fun and enriching experience for all, bringing education into the digital age.

1.5 Project Scheduling

A project schedule outlines the features that must be achieved, the resources that must be used, and the deadlines for completion. Given the limited system development period, careful scheduling is necessary to ensure the project is completed on schedule. This timetable also relates to communicating what has to be done in a limited amount of time.

Activities	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13
Research													
Analysis													
Planning													
Designing													
Development													
Testing													
Assessment													
Documentation													

Table 1.1 - Gantt Chart

Chapter 2 - Requirements

2.1 Feasibility Analysis

1. Technical Feasibility:

Existing Technology: The project leverages common web development technologies, ensuring compatibility with standard browsers and devices.

Development Expertise: As the sole developer, the necessary technical skills are available to design, develop, and maintain the E-Learning Management System.

Scalability: The chosen technologies allow for scalable development and deployment, ensuring the system's capability to handle future growth.

2. Operational Feasibility:

User Acceptance: Regular feedback sessions and demos with potential users have been conducted, ensuring that the system aligns with their needs and expectations.

Training Requirements: Minimal training is anticipated for users due to the intuitive design and user-friendly interface.

3. Legal and Ethical Feasibility:

Compliance: The system is designed to comply with data protection regulations, ensuring user privacy and adherence to legal standards.

Ethical Considerations: The project aligns with ethical standards in education, promoting inclusivity, accessibility, and fair treatment of users.

4. Social Feasibility:

User Engagement: Stakeholder involvement and regular communication with potential users ensure that the system meets their social and educational needs.

Adaptation to User Feedback: The Agile approach allows for the incorporation of user feedback, fostering a sense of user involvement and ownership.

2.2 Requirement specification

2.2.1 Functional Requirement

An explanation of the duties or capabilities that a software program or system must fulfill is given by functional requirements. They essentially describe the traits, actions, and relationships that the system must exhibit to fulfill the requirements and fulfill the preferences of its users or stakeholders.

Every system must have functional requirements. The following lists the functional requirements for this system.

FR-01	Registration
Description	Users must have the ability to register for the system by providing their name, email, and password.
Stakeholders	All users
Priority	High

FR-02	Login
Description	With their username and password, registered users ought should be able to safely log in.
Stakeholders	All users
Priority	High

FR-03	Course Management
Description	Only an admin able to create new courses by providing a course title, description, and other relevant information. And also, can edit existing courses, and delete courses from the system.
Stakeholders	Admin
Priority	High

FR-04	Course Enrollment
Description	Learners are able to browse available courses and enroll in them.
Stakeholders	Learners
Priority	High

FR-05	Payment Processing
Description	The system supports payment processing for course fees.
Stakeholders	Learners
Priority	High

FR-06	Provide Course Feedback
Description	Learners should have the capability to provide feedback on courses in which they are enrolled.
Stakeholders	Learners
Priority	Medium

FR-07	Course Feedback Viewing
Description	All users should be able to view and access feedback provided by learners for a particular course.
Stakeholders	All users
Priority	Medium

FR-08	Course Material Management
Description	Instructor should have the capability to add course materials to their courses. Additionally, Instructors should be able to edit and delete the course materials they have created.
Stakeholders	Instructors
Priority	High

FR-09	Course Material Viewing
Description	Learners should be able to view the course materials for courses in which they are enrolled.
Stakeholders	Learners
Priority	High

FR-10	User Role Management
Description	When a new user completes registration for the system, their default role should be set as "Learner." Admins should have the authority to update user roles, changing them from "Learner" to "Instructor" as needed.
Stakeholders	Admin
Priority	Medium

FR-11	User Removal
Description	Admins should have the authority to remove any user from the system as needed. This action permanently deletes the user's account and associated data from the system.
Stakeholders	Admin
Priority	High

FR-12	User Profile Editing
Description	Users should be able to edit their profiles and update personal information, including email and password.
Stakeholders	All users
Priority	Medium

FR-13	User Logout
Description	Users, including Learners, Instructors, and admins, should have the ability to log out securely from the system.
Stakeholders	All users
Priority	Medium

2.2.2 Non-functional Requirement

NFR-01	Performance
Description	Even with many concurrent users, the system should provide a fast and responsive user experience, with page loads lasting no more than [given time limit].
Stakeholders	All Users
Priority	High

NFR-02	Security
Description	Encryption and other suitable security measures should be used to transport and store user data securely, including payment information and personal data. Mechanisms for authorization and authentication should stop unwanted access.
Stakeholders	All Users
Priority	High

NFR-03	Usability
Description	The user interface should be intuitive and user-friendly, providing a positive user experience. The system should comply with applicable accessibility requirements and be usable by people with impairments.
Stakeholders	All Users
Priority	Medium

NFR-04	Reliability
Description	With little downtime for maintenance, the system need to be accessible around-the-clock. Backup and recovery protocols should be set up to prevent data loss and ensure system reliability.
Stakeholders	All Users
Priority	High

NFR-05	Documentation
Description	Comprehensive documentation should be available for users, administrators, and developers, providing clear instructions on system usage, configuration, and maintenance.
Stakeholders	All Users
Priority	Medium

Chapter 3 - Design

3.1 Development Model

The Agile Software Development Life Cycle (SDLC) paradigm was used in the creation of the E-Learning Management System. As the sole developer of this project, the Agile approach offered a flexible and iterative framework that perfectly suited the dynamic nature of the web development landscape.

There are several benefits to the Agile Software Development Life Cycle (SDLC) approach, especially for independent developers. Its iterative and incremental approach allows for flexibility and adaptability, enabling the incorporation of changes even late in the development process. Regular feedback loops and continuous collaboration with stakeholders ensure that the product aligns closely with user expectations. Agile promotes transparency through frequent demonstrations, enhancing communication and trust. Additionally, the emphasis on delivering working software in short iterations allows for early and incremental value delivery, reducing the time to market and enhancing overall project visibility and control.

3.2 Use Case Diagram

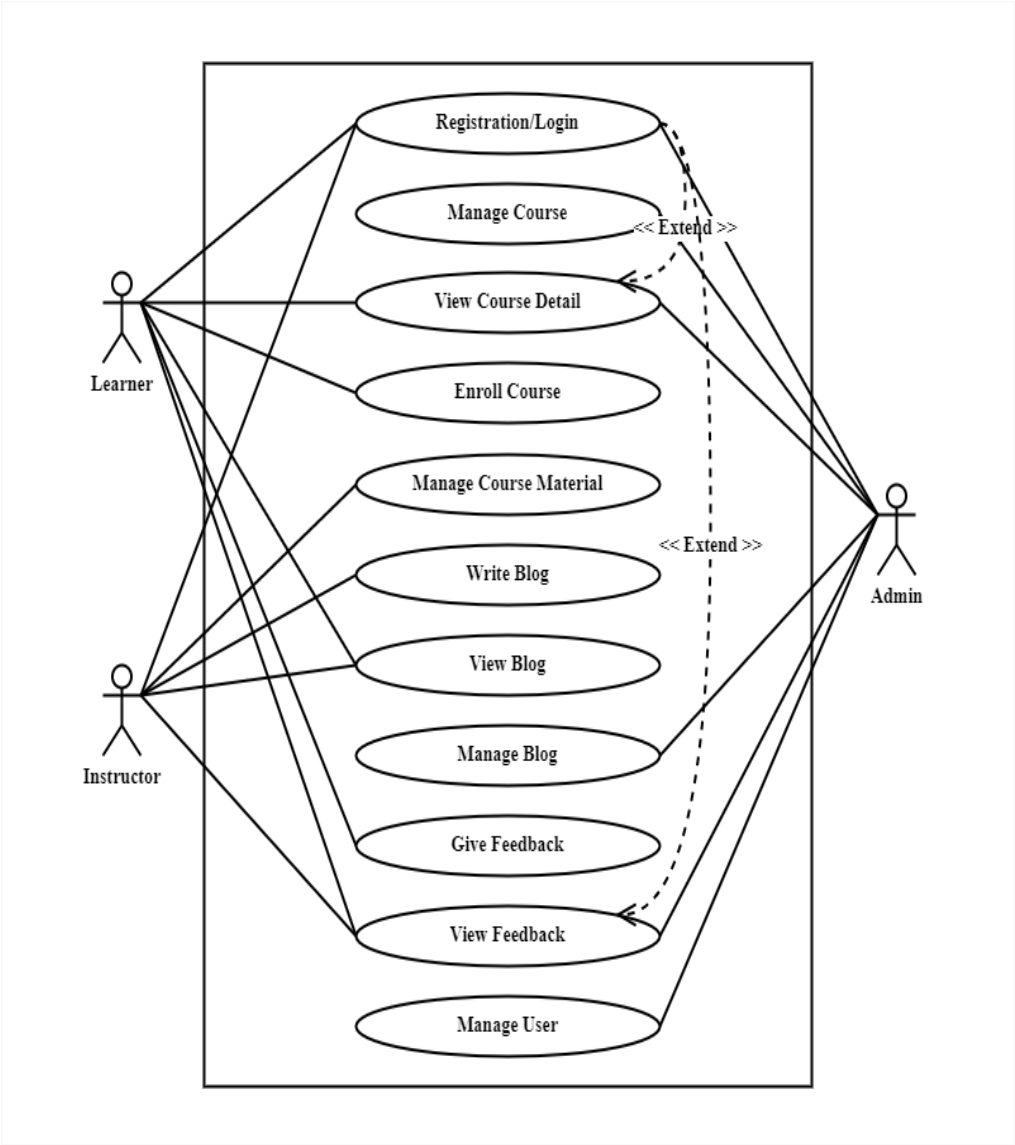

Figure 3.1 - Use Case Diagram for “E-School”

3.2.1 Use Case Description

Use Case Description for Registration/Login

Use Case ID	UC-01
Use Case Name	Registration/Login
Actor	All users
Description	Users (learners, instructors, admins) can register for the system and log in to access their accounts.
Precondition	User is not logged in.
Trigger	User accesses the system.
Flow of Events	• The "Register" option is chosen. • The user enters their login information (password, username, email address, and name). • The registration form is turned in by the user. • A confirmation email is sent to the user. • The "Login" option is chosen. • The user inputs their password and username. • The person selects "Login."
Post condition	User is logged in and can access their account.

Use Case Description for Manage Course

Use Case ID	UC-02
Use Case Name	Manage Course
Actor	Admin
Description	Admins can create, edit, and delete courses in the system.
Precondition	Admin is logged in.
Trigger	Admin selects the course management option.
Flow of Events	• Admin selects "Create Course" to add a new course. • Admin enters course details (title, description, instructor).

	• Admin clicks "Create." • Admin selects an existing course to edit. • Admin modifies course details. • Admin clicks "Save Changes." • Admin selects a course to delete. • Admin confirms deletion.
Post condition	Course management is updated according to admin actions.

Use Case Description for View Course Detail

Use Case ID	UC-03
Use Case Name	View Course Detail
Actor	All Users
Description	A course's title, description, and instructor are all visible to all users.
Precondition	User is logged in.
Trigger	User selects a course to view.
Flow of Events	• The user accesses the page with the course details. • The user chooses which course to watch.
Post Condition	User can see the details of the selected course.

Use Case Description for Manage Course Material

Use Case ID	UC-04
Use Case Name	Manage Course Material
Actor	Instructor
Description	Instructors can add, edit, and delete course materials for the courses they teach.
Precondition	Instructor is logged in.
Trigger	Instructor selects the course material management option.
Flow of Events	• Instructor selects "Add Material" for a course.

	• Instructor uploads course material (documents, videos, etc.). • Instructor clicks "Add." • Instructor selects an existing material to edit. • Instructor modifies material details. • Instructor clicks "Save Changes." • Instructor selects a material to delete. • Instructor confirms deletion.
Post condition	Course materials are updated according to instructor actions.

Use Case Description for Enroll Course with Payment

Use Case ID	UC-05
Use Case Name	Enroll Course with Payment
Actor	Learner
Description	Learners can enroll in courses by making payments for the chosen courses.
Precondition	Learner is logged in.
Trigger	Learner selects a course to enroll in.
Flow of Events	• Learner selects a course to enroll in. • Learner proceeds to payment. • Learner provides payment details and confirms payment.
Post condition	Learner is enrolled in the selected course upon successful payment.

Use Case Description for Give Feedback

Use Case ID	UC-06
Use Case Name	Give Feedback
Actor	Learner
Description	Students who are enrolled in courses have the opportunity to offer feedback.
Precondition	Learner is logged in and enrolled in at least one course.
Trigger	Learner selects a course to provide feedback.
Flow of Events	• Learner selects a course to provide feedback. • Learner enters feedback comments and ratings (if applicable). • Learner submits the feedback.
Postcondition	Feedback from students is documented for the chosen course.

Use Case Description for View Feedback

Use Case ID	UC-07
Use Case Name	View Feedback
Actor	All Users
Description	All users can view feedback provided by learners for specific courses.
Precondition	User is logged in.
Trigger	User selects a course to view feedback.
Flow of Events	• User navigates to the course feedback section. • User selects a course to view feedback.
Postcondition	User can see feedback comments and ratings for the selected course.

Use Case Description for Manage User

Use Case ID	UC-08
Use Case Name	Manage User
Actor	Admin
Description	Admins have the ability to create, update, and remove user profiles in addition to managing user accounts.
Precondition	Admin is logged in.
Trigger	Admin selects the user management option.
Flow of Events	• Admin selects "Create User" to add a new user. • Admin enters user details (name, email, role). • Admin clicks "Create." • Admin selects an existing user to edit. • Admin modifies user details. • Admin clicks "Save Changes." • Admin selects a user to delete. • Admin confirms deletion.
Postcondition	User management is updated according to admin actions.

3.3 Activity Diagram

Activity Diagram for Registration/Login

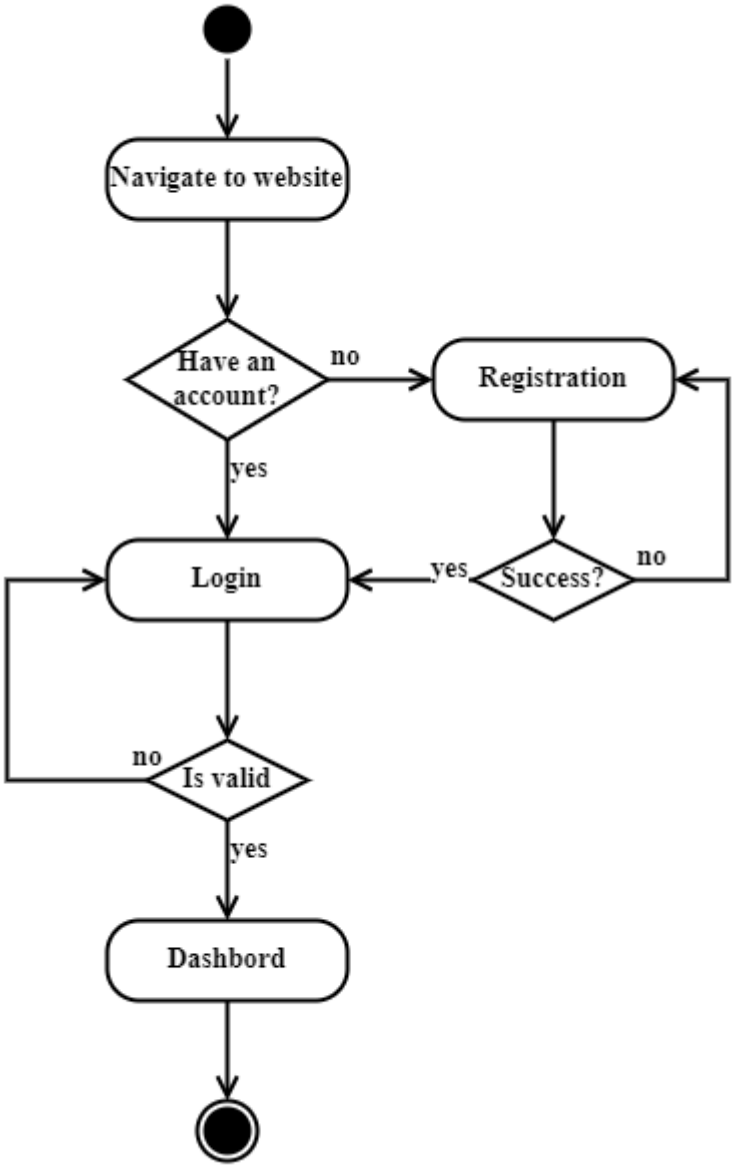

Figure 3.2- Activity Diagram for Registration/Login

Activity Diagram for Manage Course

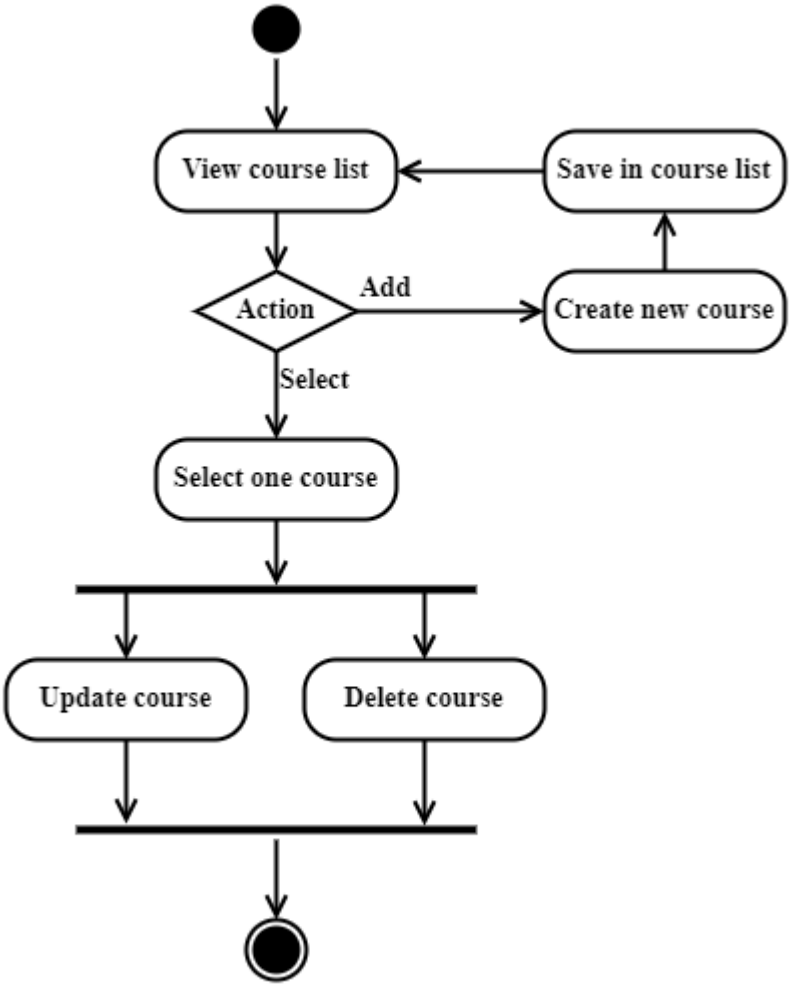

Figure 3.3 - Activity Diagram for Manage Course

Activity Diagram for View Course Details

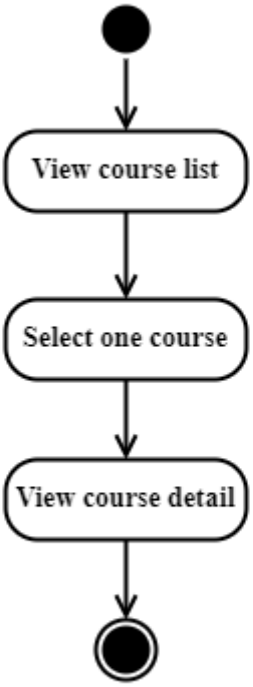

Figure 3.4 - Activity Diagram for View Course Details

Activity Diagram for Enroll Course

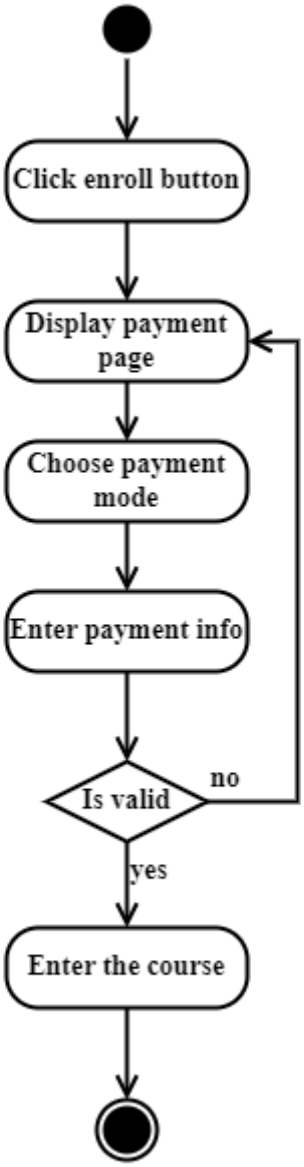

Figure 3.5 - Activity Diagram for Enroll Course

Activity Diagram for Manage Course Material

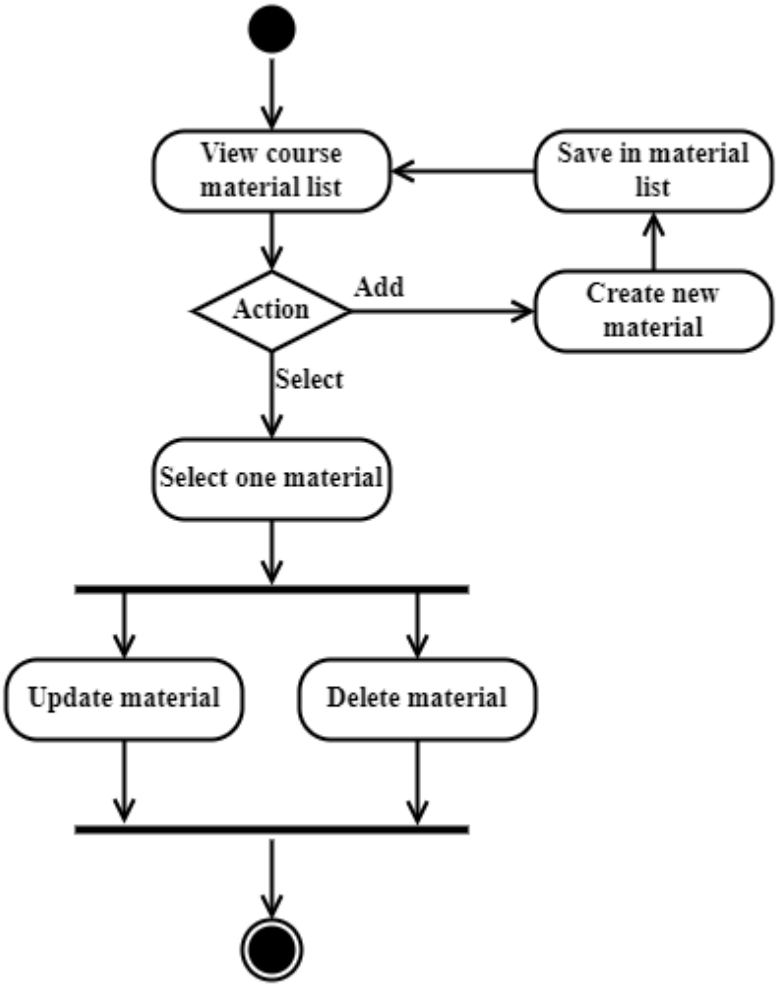

Figure 3.6 - Activity Diagram for Manage Course Material

Activity Diagram for Give Feedback

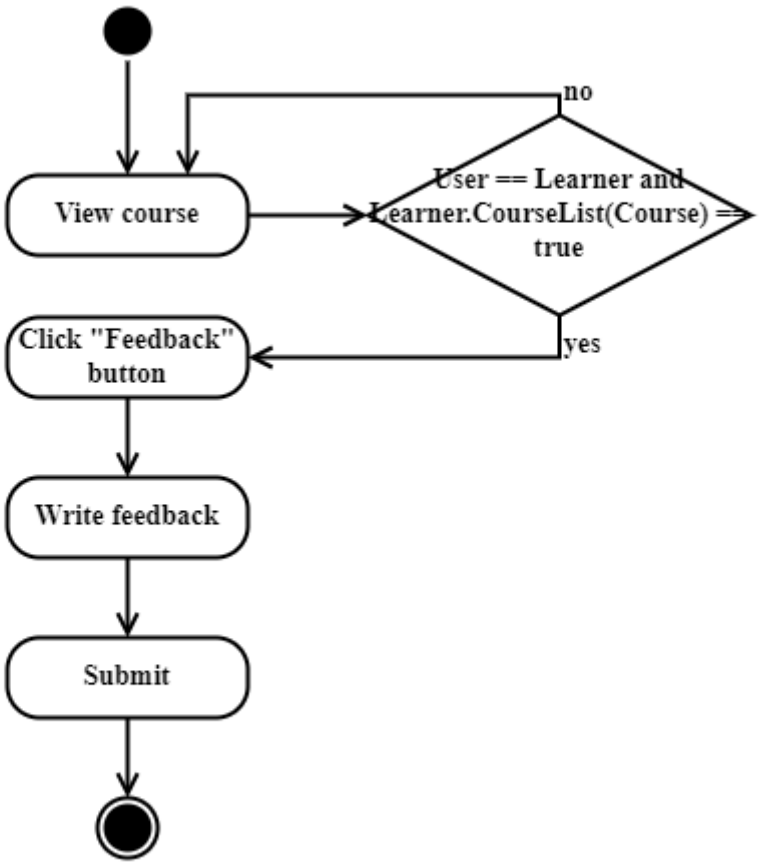

Figure 3.7 - Activity Diagram for Give Feedback

Activity Diagram for View Feedback

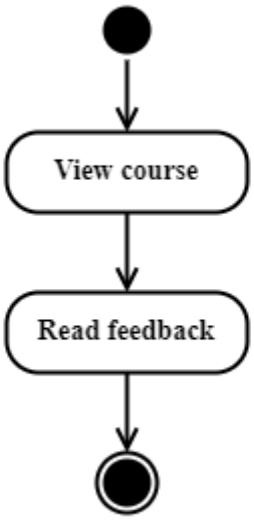

Figure 3.8 - Activity Diagram for View Feedback

Activity Diagram for Manage User

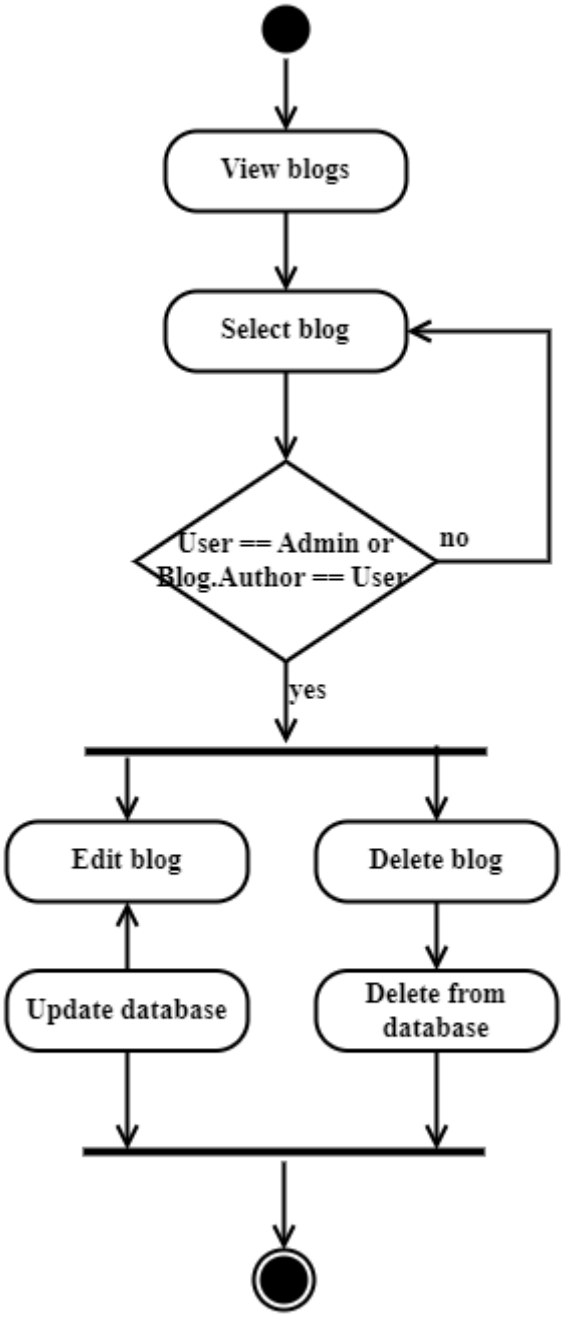

Figure 3.9 - Activity Diagram for Manage

3.4 Sequence Diagram

Sequence Diagram for Registration

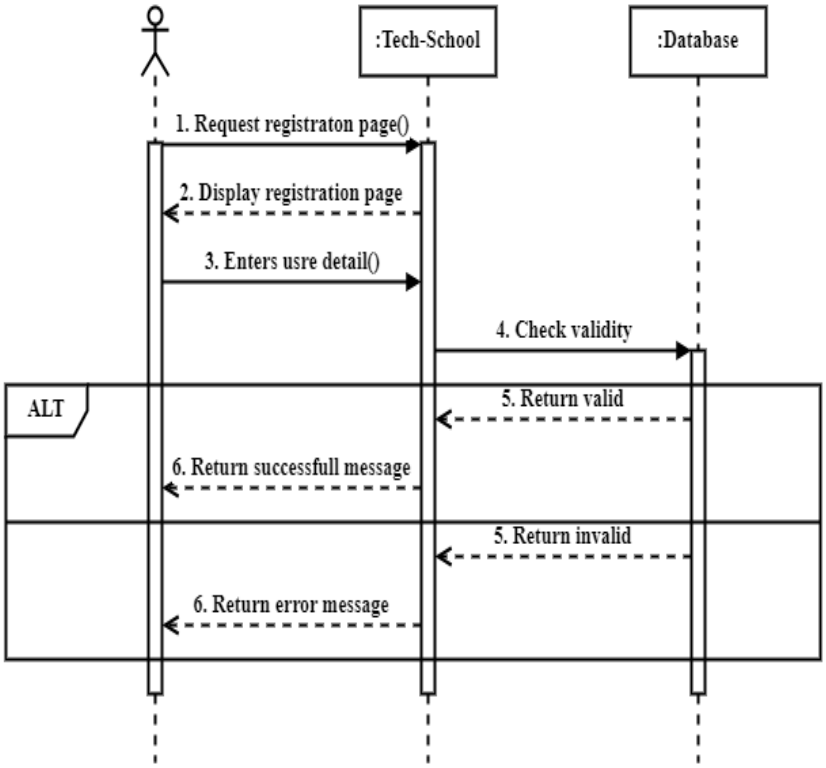

Figure 3.10 - Sequence Diagram for Registration

Sequence Diagram for Login

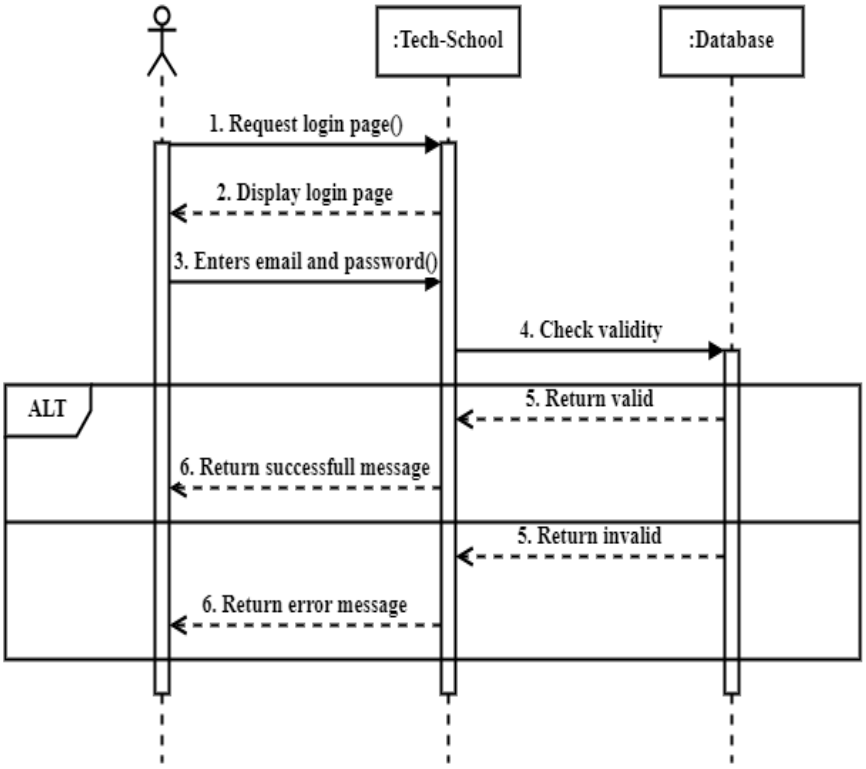

Figure 3.11 - Sequence Diagram for Login

Sequence Diagram for Add Course

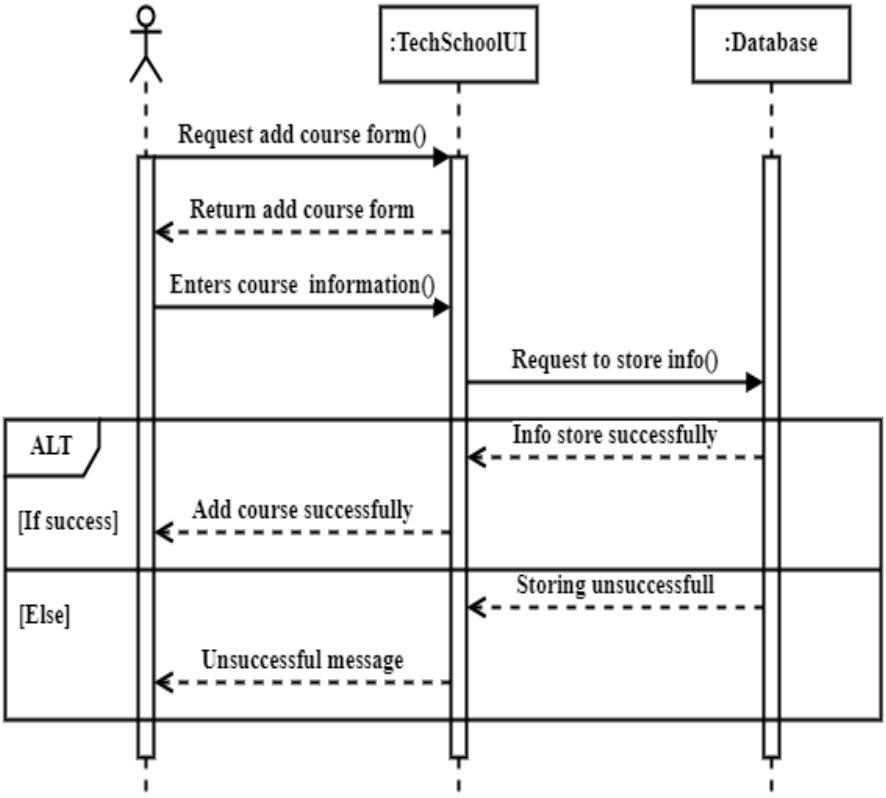

Figure 3.12 - Sequence Diagram for Add Course

Sequence Diagram for Edit Course

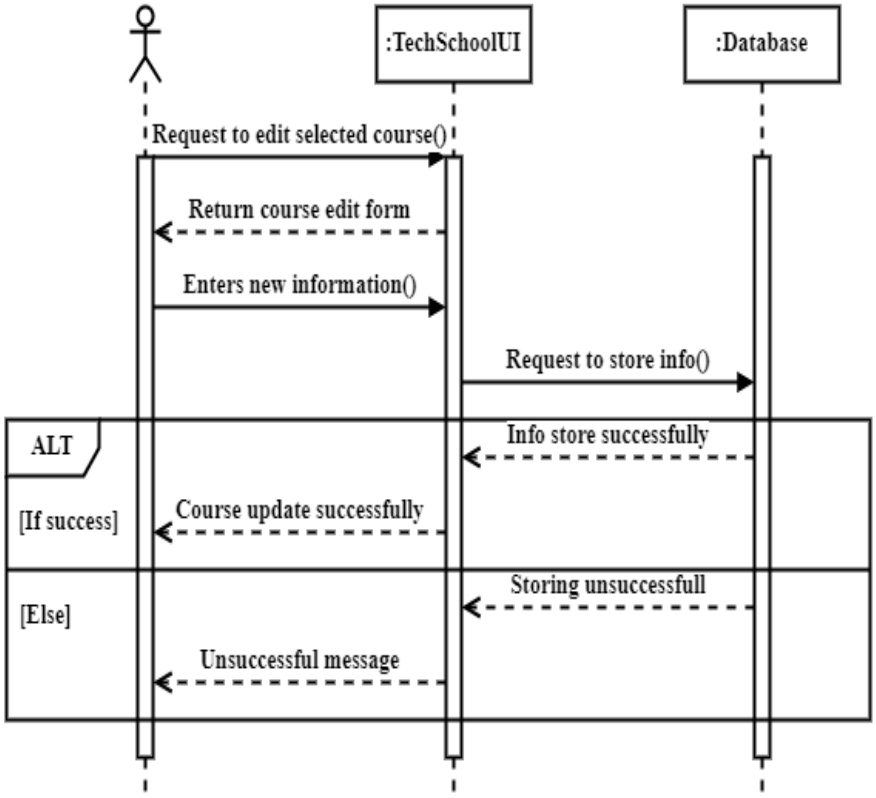

Figure 3.13 - Sequence Diagram for Edit Course

Sequence Diagram for Delete Course

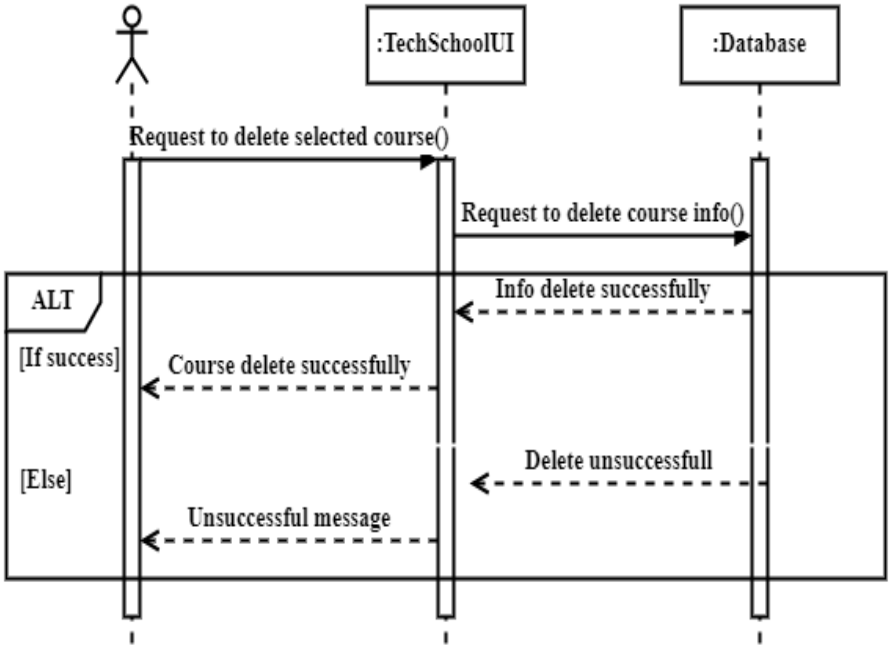

Figure 3.14 - Sequence Diagram for Delete Course

Sequence Diagram for Add Course Material

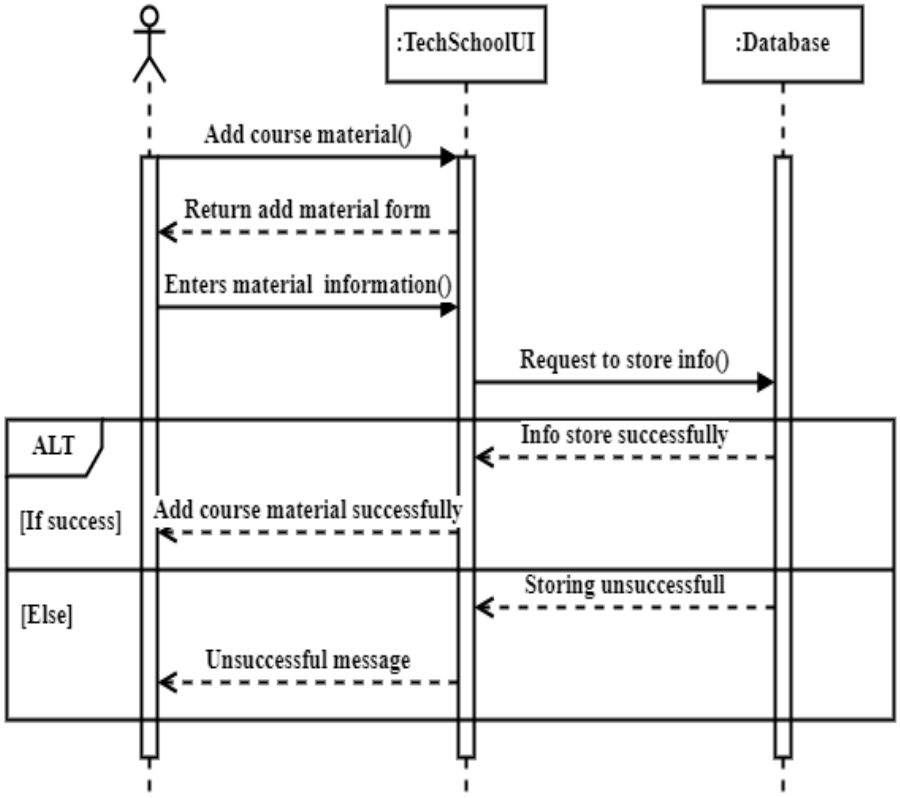

Figure 3.15 - Sequence Diagram for Add Course Material

Sequence Diagram for Edit Course Material

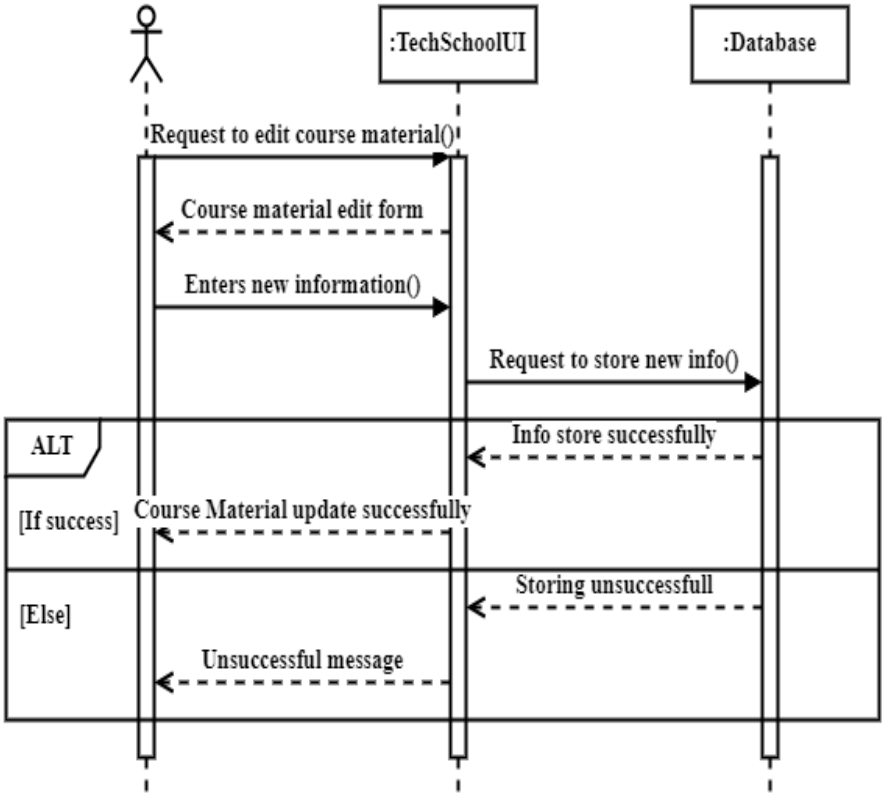

Figure 3.16 - Sequence Diagram for Edit Course Material

Sequence Diagram for Delete Course Material

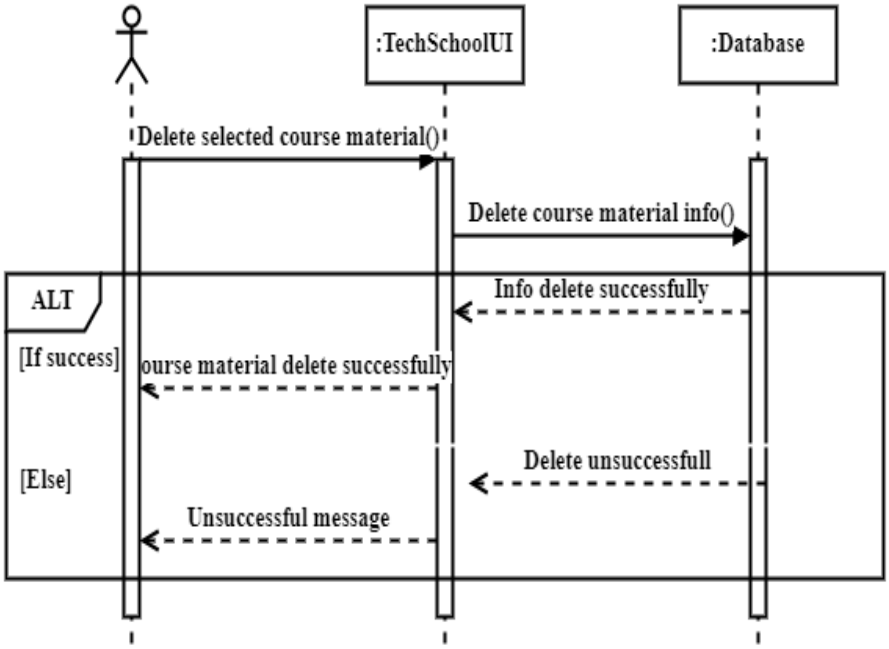

Figure 3.17 - Sequence Diagram for Delete Course Material

Sequence Diagram for Add Feedback

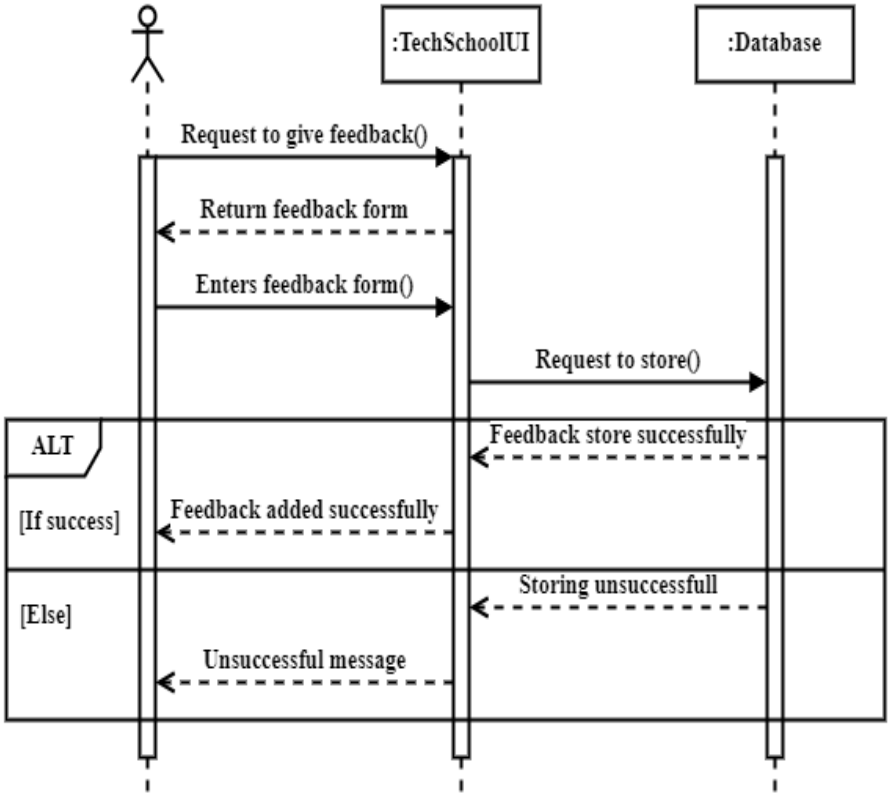

Figure 3.18 - Sequence Diagram for Add Feedback

Sequence Diagram for Enroll Course

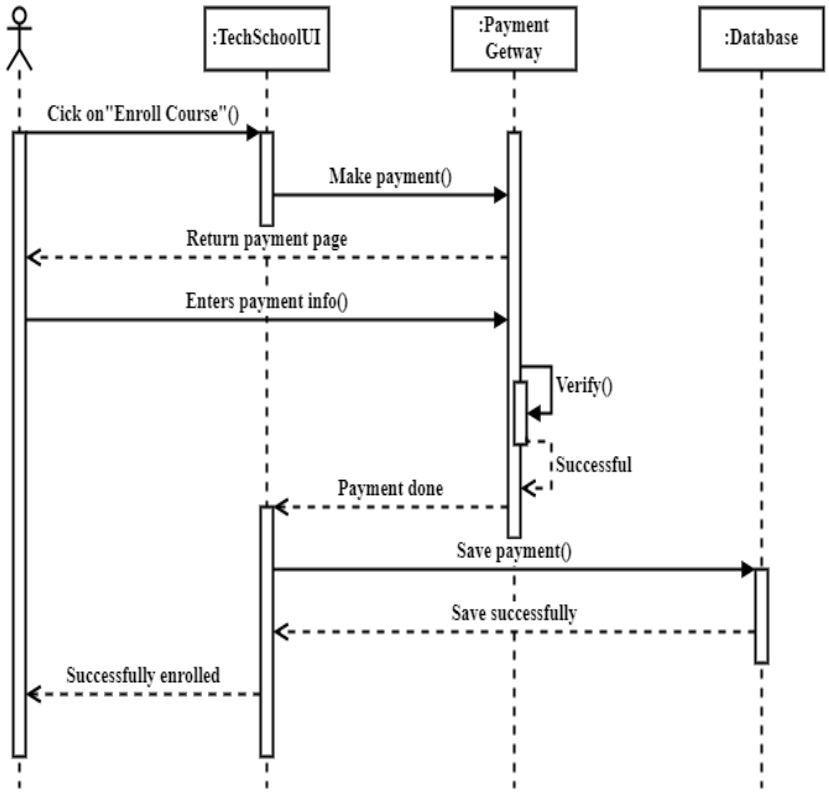

Figure 3.19 - Sequence Diagram for Enroll Course

Sequence Diagram for Delete User

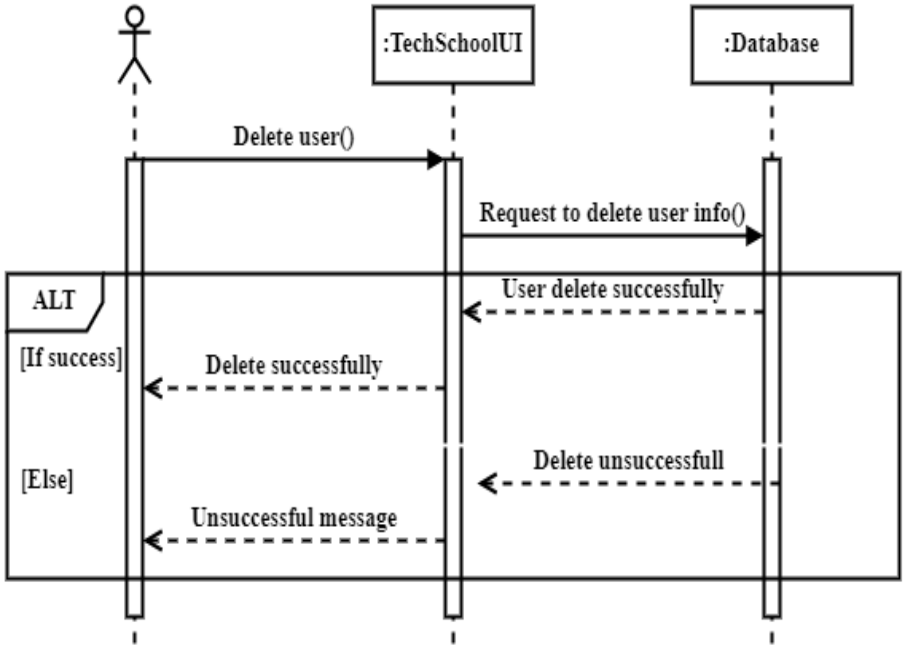

Figure 3.20 - Sequence Diagram for Delete User

3.5 Entity Relationship Diagram

ER Diagram for 'E-School'

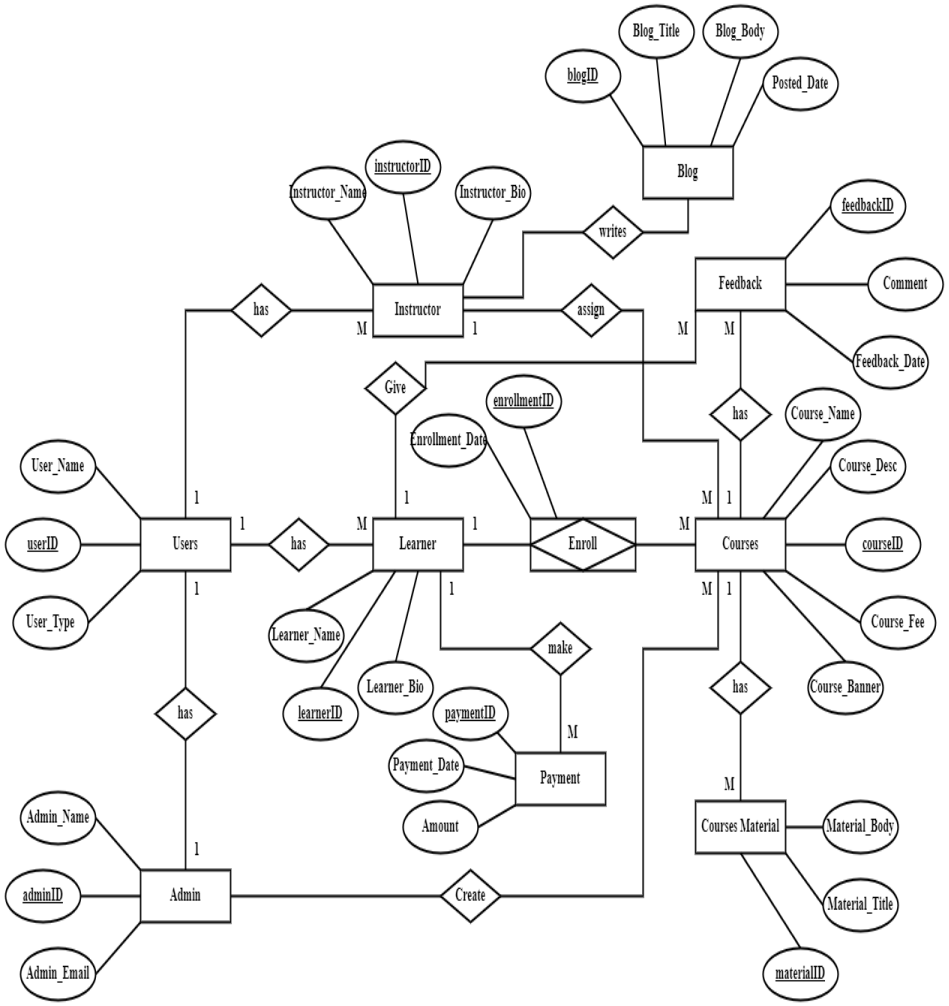

Figure 3.21 - ER Diagram for E-School

Chapter 4 - Tools & Technology

4.1 Integrated Development Environment (IDE)

- Visual Studio Code

4.2 Programming Language (PL)

- JavaScript

4.3 Programming Language Framework (PLF)

- React JS
- Node JS
- Express JS

4.4 User interface Design (UI)

- Tailwind CSS

4.5 Database

- MongoDB

4.6 Deploy and hosting

- Firebase

Chapter 5 - Testing

5.1 Testing Features

The software development process known as feature testing involves testing several iterations of a feature to determine which one provides the best user experience. By doing feature testing, we can identify which version of a new feature will be more successful and confirm whether it is a good fit for a web page or app. Feature testing aids in the creation of a web application that is successful, dependable, practical, safe, and efficient.

5.1.1 Features to be tested

Feature	Priority	Description
Registration	High	The registration feature allows new users to create accounts on the platform.
Login	High	This critical feature enables users to securely log into the Tech School platform, ensuring authentication and access to personalized content, courses, and user-specific functionalities.
Update Profile	Medium	Users can update their profiles, including personal details, preferences, and additional information
Add Course to Course Cart	Medium	The course cart functionality allows users to add courses of interest to a virtual cart for later consideration.
Course Cart Management	Medium	This feature enables users to manage the contents of their course cart, providing options to review, remove, or proceed to payment for the selected courses.
Payment	High	The payment feature facilitates secure and seamless transactions for course enrollment.
Give Feedback	Medium	Users can provide feedback on completed courses, sharing their thoughts on the content, instructor, and overall learning experience

Create Course	High	Admin can utilize this feature to create new courses, providing details such as course content, objectives, and prerequisites.
Course Management	High	The course management feature empowers admins to oversee and administer their courses.
Add Course Material	Medium	Instructors can add supplementary course materials, such as documents, presentations, and videos link, enriching the learning experience for participants.
Log Out	Low	After logging out, the session must be terminated.

Table 5.1 - Features priority table with description

5.2 Test Strategies

5.2.1 Test approach

Two different types of testing have been utilized to guarantee the system's quality. Its primary focus is on White Box and Black Box testing.

Black Box Testing: Functional testing is another name for black box testing. This testing approach ignores internal mechanisms in favour of concentrating just on the result. In response to a particular input, certain outputs are produced. These results are then compared to what was anticipated. The function is accepted if it matches.

White Box Testing: Structural testing is another name for white box testing. The system's internal mechanism is taken into account in this testing approach.

5.2.2 Testing Schedule

Test Phase	Time
Testing plan creating	2 Week
Unit testing	During Project Development
Component testing	During Project Development
User interface testing	2 Week
Performance testing	3 Week
Accessibility testing	3 Week

Table 5.2 – Testing Schedule

Chapter 6 - User Manual

6.1 Home Page

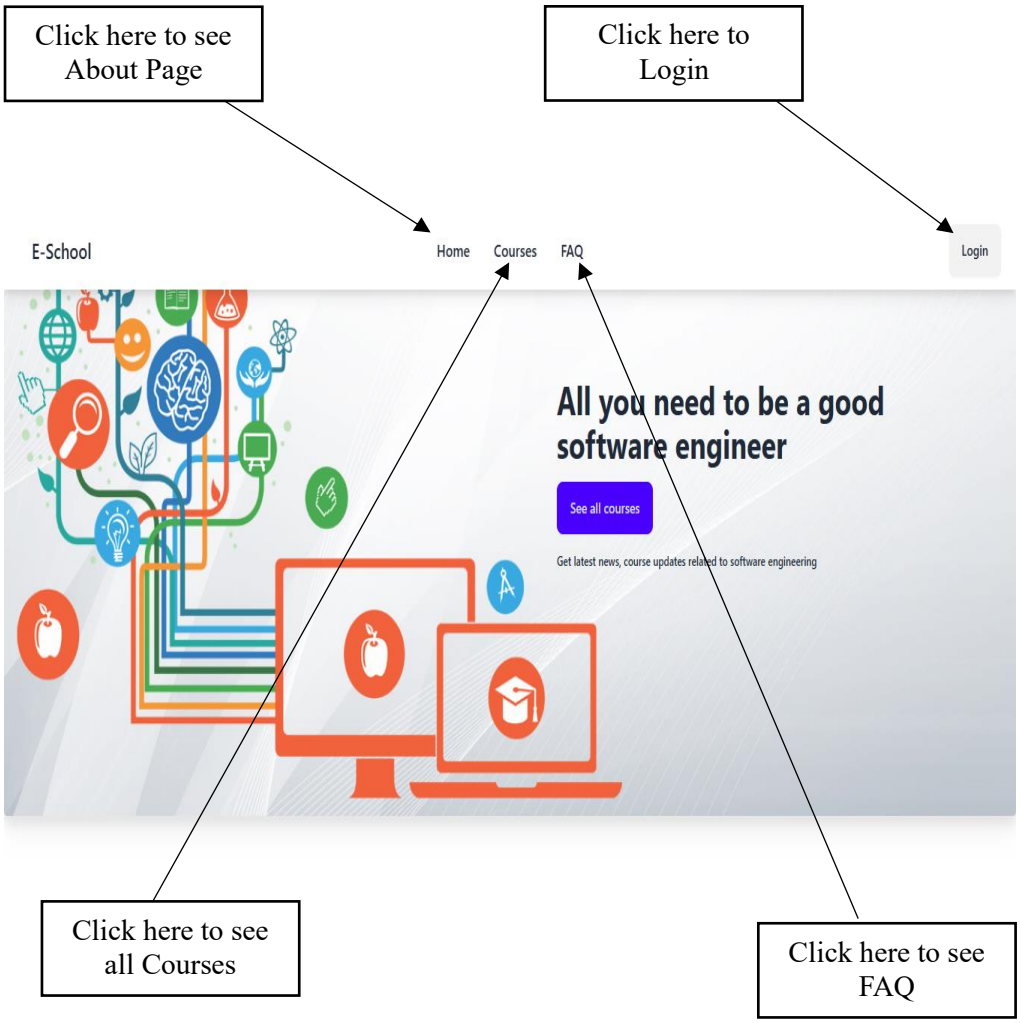

Figure 6.1 - Home Page

6.2 Login

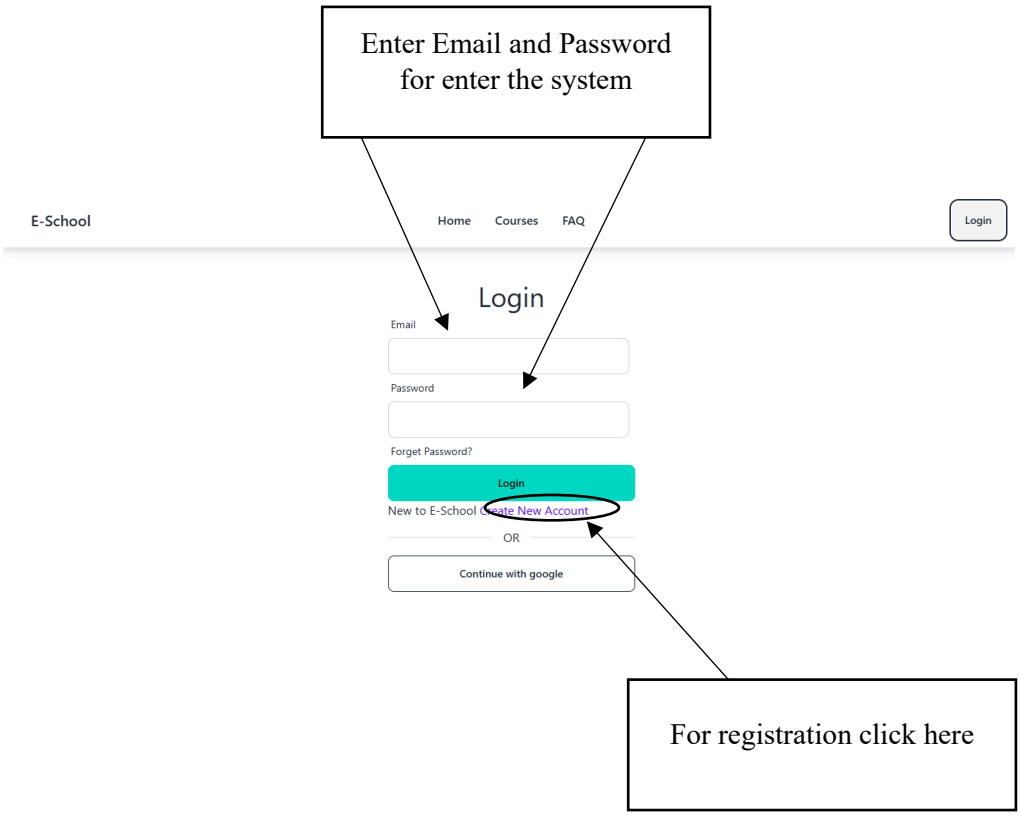

Figure 6.2 - Login Page

6.3 Profile Menu

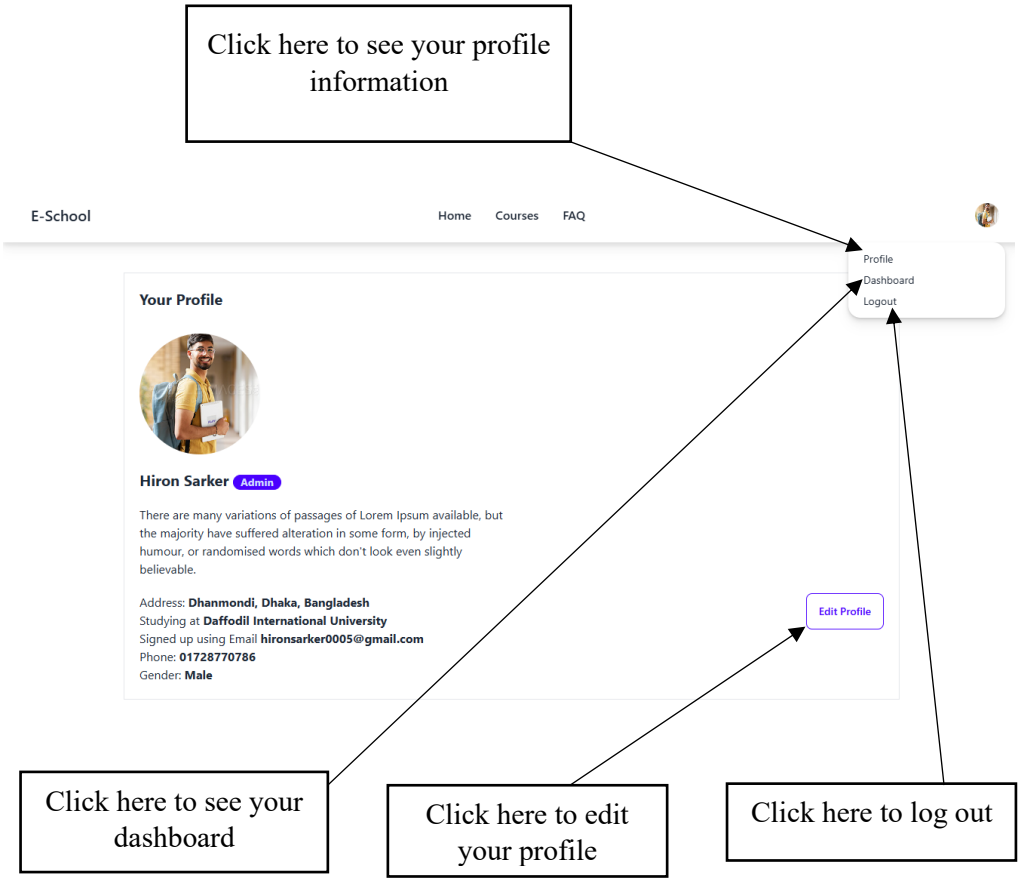

Figure 6.3 - Profile Menu

6.4 All Courses

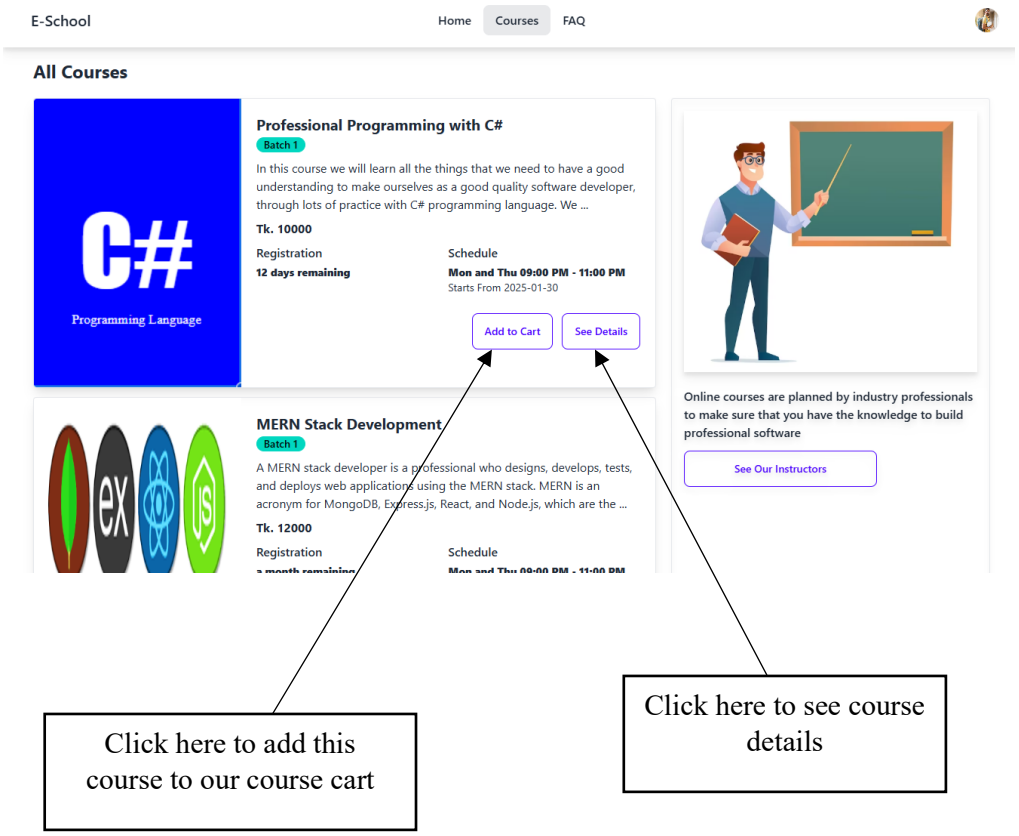

Figure 6.4 - All Courses

6.5 Admin Dashboard

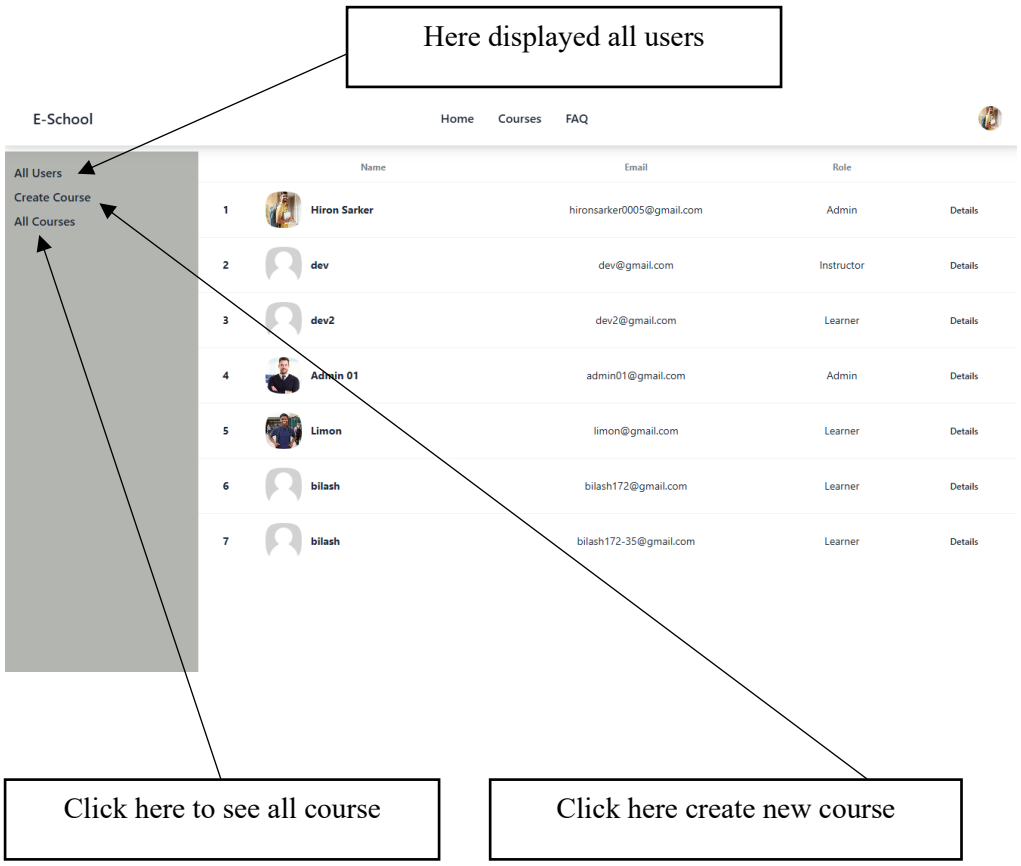

Figure 6.5 – Admin Dashboard

6.6 Create Course

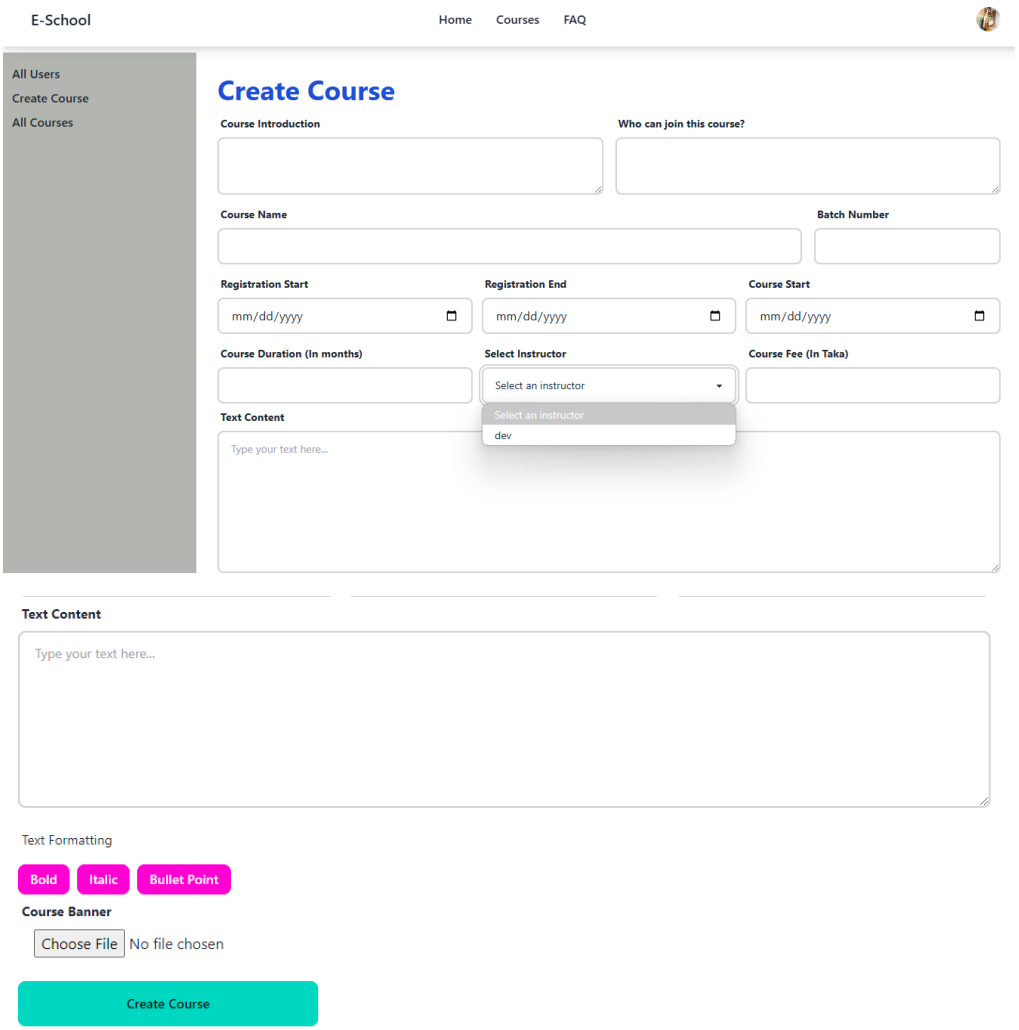

Figure 6.6 - Create Course Page

Chapter 7 - Conclusion

7.1 Summary

The E-Learning Management System project signifies a significant step forward in reshaping the landscape of online education. This innovative platform is designed to tackle challenges inherent in digital learning, providing a user-friendly interface for learners, instructors, and administrators. The project's focus on creating a seamless and efficient system is visually depicted through detailed use case and activity diagrams, offering a clear understanding of its functionalities. The successful completion of this project is attributed to collaboration, innovation, and the collective effort of those involved. It stands as a testament to the commitment to advancing online education through technology.

7.2 Project Link

https://e-school.app/

7.3 Limitations

There are certain features that have not been developed yet. I am working on expanding the functionality of the platform, and these features are planned for future development.

- Real-time Instructor-Learner Communication Feature
- Feedback Feature
- Course Material Feature

7.4 Future Scope

Discussion Forums: Establish discussion boards where students can interact with teachers and peers, ask questions, and have discussions. Forums can be arranged according to a topic or course.

Interactive Assessments: Incorporate interactive quizzes, assignments, and simulations to assess learners' understanding and skills.

Course Request System: A course request system will be implemented to allow users to suggest topics or subjects they would like to see on the platform.

In-Platform Notifications: In -platform notifications will keep users informed about new courses relevant announcements. This feature enhances user engagement and ensures that learners and instructors stay updated on platform activities.

7.5 Reference

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https://www.talentlms.com/

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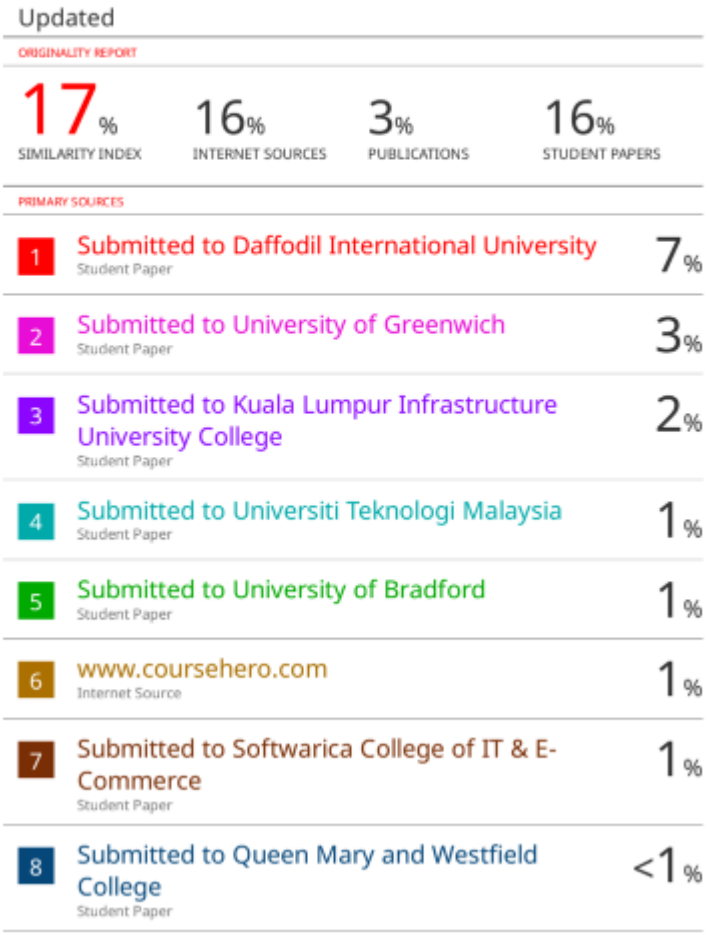

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