



**Daffodil**  
*International*  
**University**

A Project Report on

**Chok Pencil – An online Course Platform**

Course Code: SWE 431

Course Title: Thesis / Project

Section: PC-A

Submission Date: 30/01/2022

**SUBMITTED BY**

Md. Kamrul Haque

ID: 173-35-255

Department of Software Engineering

Daffodil International University

**SUPERVISED BY**

Md. Rajib Mia

Lecturer

Department of Software Engineering

Daffodil International University

This Project report has been submitted in fulfillment of the requirements for the Degree Bachelor of Science in Software Engineering.

**© All right Reserved by Daffodil International University**

## APPROVAL

This project entitled on “*Chok Pencil – An Online Course Platform*”, submitted by *Md. Kamrul Haque*(ID: 173-35-255) 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.



---

**Chairman**

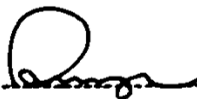
**Dr. Imran Mahmud**  
**Associate Professor and Head**  
**Department of Software Engineering**  
**Daffodil International University**



---

**Abu Shamim Aminur Razzaque**  
**Director**  
**Computer Ease Limited**

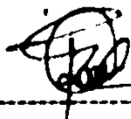
**External Examiner**



---

**SK. Fazlee Rabby**  
**Lecturer**  
**Department of Software Engineering**  
**Daffodil International University**

**Internal Examiner 1**



---

**Md. Rajib Mia**  
**Lecturer**  
**Department of Software Engineering**  
**Daffodil International University**

**Internal Examiner 2**

# DECLARATION

I hereby declare that the project work entitled “Chok Pencil” submitted to the Daffodil. International University, is a record of an original work that has been prepared by me during the year 2021 under the guidance of Md. Rajib Mia, Lecturer, Department of Software Engineering, Daffodil International University, and this project work is submitted in partial fulfillment of the requirements for the award of the degree of Bachelors in Software Engineering.

I also declare that this project is the outcome of my own effort, that it has not been submitted to any other university for the award of any degree.



-----  
Md. Kamrul Haque

ID: 173-35-255

Department of Software Engineering

Daffodil International University



-----  
Md. Rajib Mia

Lecturer

Department of Software Engineering

Daffodil International University

# ACKNOWLEDGMENT

First and foremost, I would like to praise Allah SWT the Almighty, the Most Gracious, and the Most Merciful for His blessing given to the courage and health to complete my project. Peace and blessing of Allah be upon last Prophet Muhammad SAWS (Peace Be Upon Him).

At the very outset of this report, I would like to extend my sincere & heartfelt obligation towards all the personages who have helped me in this endeavor. Without their active guidance, help, cooperation & encouragement, I would not have made headway in the project.

With my deepest gratitude to my supervisor Md. Rajib Mia, Lecturer, Department of Software Engineering, for his conscientious guidance, encouragement, motivation, and help throughout accomplishing this work. Without his support, it would be difficult to complete the project in a limited time period.

I am extremely thankful and pay my gratitude to the project/thesis committee and other faculty members for their valuable guidance and support on the completion of this project in its present.

I extend my gratitude to Daffodil International University for giving me this opportunity. I would like to express my deep gratitude to our honorable department Head of SWE, for encouraging me and giving me such an opportunity. I want to thank all my respected teachers who teach us in a great, interesting and understandable way.

I also acknowledge with a deep sense of reverence, my gratitude towards my parents and members of my family, who have always supported me morally as well as economically.

At last, but not least, gratitude goes to all of my friends who directly or indirectly helped me to complete this project report.

Any omission in this brief acknowledgment does not mean a lack of gratitude.

Thanking You,

Md. Kamrul Haque.

# PROJECT SUMMARY

“Chok Pencil” is an e-Learning Platform aiming to offer online courses for Bangladeshi students. It is a feature rich online course platform with very user-friendly user interface, versatile assessment techniques and immense flexibility. The main target of the platform is to deliver high quality e-learning and improve the quality of e-learning.

# Table of Contents

---

<b>DECLARATION</b> .....	i
<b>ACKNOWLEDGMENT</b> .....	ii
<b>PROJECT SUMMARY</b> .....	iii
<b>Chapter 1: Introduction</b> .....	1
<b>1.1 Project Overview</b> .....	1
<b>1.2 Motivation</b> .....	2
<b>1.3 Objective</b> .....	2
<b>1.4 Scope</b> .....	3
<b>1.5 Feasibility Study</b> .....	3
<b>1.6 Stakeholders</b> .....	3
<b>1.7 Modules of the System</b> .....	4
<b>1.8 Project Schedule</b> .....	5
<b>Chapter 2: Requirements Analysis &amp; Specification</b> .....	6
<b>2.1 Functional Requirements (FR):</b> .....	6
<b>2.2 Non-Functional Requirements (NFR):</b> .....	10
<b>2.3 Use-Case Diagrams</b> .....	13
<b>2.4 Use-Cases of the System</b> .....	16
<b>Chapter 3: System Design</b> .....	33
<b>3.1 Sequence Diagrams:</b> .....	33
<b>3.2 Activity Diagrams:</b> .....	46
<b>3.3 Data-Flow Diagram</b> .....	60
<b>3.4 Entity Relationship Diagram</b> .....	61
<b>3.5 Class Diagram</b> .....	62
<b>Chapter 4: System Development</b> .....	63
<b>4.1 Tools and Technologies:</b> .....	63
<b>4.2 Front-End Development:</b> .....	64
<b>4.3 Back-End Development:</b> .....	64
<b>4.4 Database Programming:</b> .....	65

<b>Chapter 5: System Testing</b> .....	66
<b>5.1 Testing Approach:</b> .....	66
<b>5.2 Pass/Fail Criteria:</b> .....	66
<b>5.3 Test Cases:</b> .....	66
<b>Chapter 6: User Manual</b> .....	77
<b>6.1 Landing Page:</b> .....	77
<b>6.2 Registration Page:</b> .....	78
<b>6.3 Login Page:</b> .....	80
<b>6.4 Instructor Dashboard:</b> .....	81
<b>6.5 Create Course:</b> .....	81
<b>6.6 Course Dashboard:</b> .....	83
<b>6.7 Create Course Module:</b> .....	85
<b>6.8 Create Content:</b> .....	86
<b>6.9 Create Assessment:</b> .....	87
<b>6.10 Create Question:</b> .....	88
<b>6.11 Publish Assessment:</b> .....	90
<b>6.12 Add Instructor:</b> .....	90
<b>6.13 Course Index Page:</b> .....	92
<b>6.14 Course Details Page:</b> .....	94
<b>6.15 Student Dashboard:</b> .....	95
<b>6.16 Search Course:</b> .....	95
<b>6.17 Wishlist Course:</b> .....	97
<b>6.18 Enroll Course:</b> .....	99
<b>6.19 Payment:</b> .....	100
<b>6.20 View Course Content:</b> .....	101
<b>6.21 Submit Assessments:</b> .....	103
<b>6.22 Grade Assessments:</b> .....	105
<b>6.23 Get Obtained Marks:</b> .....	106
<b>6.24 Rate/Review Course:</b> .....	107
<b>6.25 Course Discussion Panel:</b> .....	108
<b>6.26 Create Discussion Thread:</b> .....	109
<b>6.27 Reply to Discussion Thread:</b> .....	110
<b>6.28 Mark Reply as Solution:</b> .....	112

6.29 Un-Enroll Course: .....	113
6.30 Leave Course: .....	114
6.31 Admin Dashboard: .....	115
6.32 Verify Payment:.....	116
6.33 Verify Instructor: .....	117
6.34 Create Category:.....	118
6.35 Create Institution: .....	120
6.36 Assign Course to Institution:.....	121
6.37 Notifications: .....	122
6.38 Mails: .....	123
<b>Chapter 7: Conclusion .....</b>	<b>125</b>
7.1 Challenges and Achievements:.....	125
7.2 Limitations:.....	125
7.3 Future Scope:.....	126
7.4 Conclusion: .....	126
7.5 Useful Links:.....	126
<b>REFERENCES.....</b>	<b>127</b>



# Chapter 1: Introduction

This chapter describes the overview of the project, the motivation to select it, its feasibility, scope and objective, the project schedule and other introductory aspects.

## 1.1 Project Overview

“Chok Pencil” is an e-Learning Platform aiming to offer online courses for Bangladeshi students. It is a feature rich online course platform with very user-friendly user interface, versatile assessment techniques and immense flexibility. The main target of the platform is to deliver high quality e-learning.

The project offers flexibility so that both individual Instructors and Institutions can offer courses in the platform. Moreover, it can be used as a learning management system owned by one specific educational or training institution with minimal modifications as well as an open online course platform. Which makes it a complete system for any types of e-learning purpose.

Unlike other existing online course platforms in Bangladesh, the project offers versatile Assessment techniques which will ensure the quality and standard of the online education. The Assessment techniques implemented in the system are: Multiple Choice Questions (MCQs) with one or multiple correct answers, Short Question & Answers, Descriptive Question & Answers, File Submissions with file type validation, Link Submissions with domain validation. MCQs will be automatically graded by the system while other submissions will need to be manually graded by the Instructors. Peer grading by fellow students of a Course is also planned to be introduced later.

As the system is planned for fully online education, a communication medium is a must to ensure interactive & effective learning environment. The Course Discussion Panel is designed to serve this purpose properly where Students or Instructors of a Course can post their queries & messages and others can reply to those. A Post can optionally be posted under a specific Course content or Assessment to better identify the correlation between Course materials and Queries. A Reply to the Post can be marked as solution to the original Query to better identify the unsolved queries. Moreover, all the Posts & Replies on the Course Discussion Panel will be private to the Students enrolled into the Course and the Instructors who owns the Course. Although, all Admins of the system can also access and interact on the Course Discussion Panel.

The system also provides Student Progress Report which is necessary for tracking progress of each student of a particular Course. Instructors of a Course can access reports of all the Students enrolled into that Course while a Student can only track his own.

The project includes certification upon completing a Course with required marks for only Courses assigned to an Institution. As the Institution will provide the credibility of the certification.

The project aims to provide some unique features like Plagiarism Checking for all the descriptive assessment submitted by the Students which will further improve the quality of e-learning and document

reader which will help to reduce piracy of Intellectual Property while providing the necessary accessibility of the material.

## 1.2 Motivation

Online education is one of the most profound inventions of modern information technology. Anyone can get access to education regardless of their location, schedule, profession and demand via the internet which would not be possible in the traditional classroom-based education system. While most developed and developing countries have already advanced in this field Bangladesh is seriously lagging behind. Which has been clearly visible during the COVID-19 pandemic. The whole education system had been come into a halt Bangladesh as the pandemic began.

Not only for emergency situations like COVID-19 but also in long run Bangladeshi students will fall behind in competition with respect to the rest of the world if the country does not put emphasise on quality e-learning and distant learning.

Again, among the things the pandemic has changed, the learning approach is a massive one. The world is tending towards e-learning more than ever. With further developments in technologies like augmented reality and virtual reality this trend will even become wider as everything even laboratory experiments will be possible online. So, it is the most appropriate time to popularize e-learning in our country also.

Although there are some existing e-learning or online course platforms in Bangladesh, they don't have good assessment techniques hence fails to ensure quality of the education. Moreover, they also lack in flexibility. Most of them offers sophisticated user interfaces which needs good command over technology hence training to operate. Some of the them may also fail to ensure integrity and credibility.

This project intends to not only solve all the problems mentioned by delivering a flexible, user-friendly, zero maintenance capable e-learning platform ensuring quality, integrity and credibility of the education delivered but also aims to improve the quality of e-learning as a whole by implementing some unique features like plagiarism check.

## 1.3 Objective

The main objective of this project is:

- To help students learn from the best mentors.
- To deliver quality courses.
- To Create more skilled workers for the industry.
- To Implement most effective assessment techniques.
- To provide practical oriented education.
- To improve the quality of distant learning/e-learning

## **1.4 Scope**

The platform will contain courses ranging from high school to post graduate level in all categories. Both institutions and individuals can offer courses in the platform.

## **1.5 Feasibility Study**

### **1.5.1 Technical Feasibility**

The requirements of the project can be fully implemented by the technologies and resources available. Most of the features can be developed within the project constraints. Some will be implemented by integrating APIs (application programming interfaces) of other systems as implementing them manually is quite a complex process and can consume enormous time.

Almost all of the technologies used to develop the system are open source and enterprise level. All of them has detailed documentation. So, maintainability and scalability are fully ensured. All of the technologies and frameworks used in developing the project comply with the modern industry standard. The developed system will be thoroughly tested. So, the system is fully reliable and secured.

### **1.5.2 Financial Feasibility**

The system is mostly developed with open source and free technologies which does not require any subscriptions. The operational cost comprises of cost of domain, server resources and some of the subscription from APIs integrated. As the project will host both paid and non-paid contents, the operational costing is not overwhelming. Therefore, the project is financially feasible.

### **1.5.3 Operational Feasibility**

The system tends to solve a major problem regarding education sector of the country. The features implemented in the system ensure the quality of e-learning hence attempt to solve its major role along with delivering easy to use, flexible and maintenance free system to ensure it is fully operational.

## **1.6 Stakeholders**

The main stakeholders of the system are Students using the system, Instructors offering courses in the system and the Admins of the system.

### **1.6.1 Students**

Students will start using the system by registering themselves with valid email address and other details. Although, students can search courses, view details of a course and enquire about a course without logging into the system, accessing all other features require authentication. Student will first search or browse course listing to find a course then optionally bookmark it, enroll it by paying course fee if required via the payment gateway of the system or other method available then may have to wait for payment approval. Once approved and enrolled they can access all course materials, submit assessments, interact with other students and instructors of the course through course discussion panel, rate and review the course and download course certificate if available from the course dashboard.

### **1.6.2 Instructors**

Instructors also use the system by registering themselves with valid email address and other valid data and documents to prove their eligibility and identity. After registering they have to wait for the approval of their account by admins of the system. Once approved they can offer their own course or can be added to pre-existing courses by other existing instructors of that course or by admins. After creating a course in the platform with appropriate details or added to pre-existing course, instructors can create contents, upload course materials, create assessments, grade assessments submitted by students, view students' progress report and interact with the students and fellow instructors of a course on discussion panel all through the course dashboard.

### **1.6.3 Admins**

Although admins can perform almost all the actions performed by instructors, their main responsibility is to approve new instructor accounts, verify payments, create institutions, course categories, assigning courses to institutions, adding instructors to courses and overall monitoring of the system.

## **1.7 Modules of the System**

- Authentication Module
- Role Management Module
- Course Module
- Course Contents Module
- Assessment Module
- Course Discussion Panel
- Certification Module
- Institution Module
- Search Module
- Payment Module
- Mail & Notification Module

# 1.8 Project Schedule

Weeks \ Activities	W 1	W 2	W 3	W 4	W 5	W 6	W 7	W 8	W 9	W 10	W 11	W 12	W 13	W 14	W 15	W 16	W 17	W 18	W 19	W 20	W 21	W 22	
Requirements Analysis	█																						
Feasibility Study		█																					
System Design			█	█																			
System Development					█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█			
System Testing																					█	█	
System Deployment																							█

Figure 1.8.1: Gantt Chart for Project Schedule

# Chapter 2: Requirements Analysis & Specification

This chapter describes the requirements of the system and how they have been analyzed to make use-cases which will be very helpful for system design and development.

## 2.1 Functional Requirements (FR):

Functional Requirements makes a system fully functional. In other words, these are those requirements which must be implemented in order to consider the system as functional. The functional requirements of the concerning project are given below:

<b>FR-1</b>	<b>Register</b>
Description	Users must be able to register
Stakeholders	Students, Instructors

<b>FR-2</b>	<b>Login</b>
Description	Users must be able to login
Stakeholders	Students, Instructors, Admins

<b>FR-3</b>	<b>Create Admin Account</b>
Description	Admins can create new Admin Account
Stakeholders	Admins

<b>FR-4</b>	<b>Verify Instructor Account</b>
Description	Admins will be check details & verify new Instructors
Stakeholders	Admins

<b>FR-5</b>	<b>Create &amp; Manage Course</b>
Description	Once verified instructors can create new courses and manage them. Admins can also perform this action.
Stakeholders	Instructors, Admins

<b>FR-6</b>	<b>Create &amp; Manage Course Modules</b>
Description	Instructors of a course can add new course modules and manage them. Admins can also perform this action.
Stakeholders	Instructors, Admins

<b>FR-7</b>	<b>Create &amp; Manage Content</b>
Description	Instructors of a course can add new course content inside an existing course module and manage them. Admins can also perform this action.
Stakeholders	Instructors, Admins

<b>FR-8</b>	<b>Create &amp; Manage Assessment</b>
Description	Instructors of a course can add new assessment inside an existing course module and manage them. Admins can also perform this action.
Stakeholders	Instructors, Admins

<b>FR-9</b>	<b>Create &amp; Manage Questions</b>
Description	Instructors of a course can create multiple questions inside an existing assessment and manage them. Admins can also perform this action.
Stakeholders	Instructors, Admins

<b>FR-10</b>	<b>Publish Assessment</b>
Description	Instructors of a course can publish an existing assessment which contains at least one question. Admins can also perform this action.
Stakeholders	Instructors, Admins

<b>FR-11</b>	<b>Search Course</b>
Description	Users can search for courses with category or course title or topic.
Stakeholders	Students, Instructors, Admins, Guests

<b>FR-11</b>	<b>Wishlist Course</b>
Description	Registered students can wishlist specific courses. Which can be found easily and enrolled later.
Stakeholders	Students

<b>FR-12</b>	<b>Enroll Course</b>
Description	Registered students can enroll a course. Enrolling paid course requires paying course fee.
Stakeholders	Students

<b>FR-13</b>	<b>Un-enroll Course</b>
Description	Students can un-enroll from any course at any time but this may erase their progress. If the student wants to re-enroll then the course fee will need to be paid again if the course was paid.
Stakeholders	Students

<b>FR-14</b>	<b>Add Payment Info</b>
Description	Admins can add Mobile Banking Information needed for completing payments
Stakeholders	Admins

<b>FR-15</b>	<b>Pay Course Fee</b>
Description	Students will need to pay course fee to enroll into paid courses
Stakeholders	Students

<b>FR-16</b>	<b>Verify Payments</b>
Description	Admins will verify the payments completed by the students when mobile banking is selected as payment option.
Stakeholders	Admins

<b>FR-17</b>	<b>Access Course Content</b>
Description	Once Enrolled into a course, the student can access all it's contents, assessments, discussion panel, announcements etc. materials. Instructors of that particular course & all Admins can also access all the course materials.
Stakeholders	Students, Instructors, Admins

<b>FR-18</b>	<b>Submit Assessment</b>
Description	Enrolled students can submit assessments of the course within deadline.
Stakeholders	Students

<b>FR-19</b>	<b>Grade Assessment</b>
Description	Instructors of a course will be able to see the students' responses to each question and grade them. MCQ's will be graded automatically by the application upon submission.
Stakeholders	Instructors



<b>FR-20</b>	<b>Get Marks</b>
Description	Students can see their obtained marks on each question once it has been graded by the instructors.
Stakeholders	Students

<b>FR-21</b>	<b>Create &amp; Mange Discussion Thread</b>
Description	Instructors of the course, enrolled students and all admins can create new threads or posts in the course discussion panel. Only thread owner can edit or delete it later. Deleting a thread will also erase all replies to it.
Stakeholders	Students, Instructors, Admins

<b>FR-22</b>	<b>Reply to Discussion Thread</b>
Description	Instructors of the course, enrolled students and all admins can reply to any existing threads or posts in the course discussion panel. Only reply owner can edit or delete it later.
Stakeholders	Students, Instructors, Admins

<b>FR-23</b>	<b>Mark Reply as Solution</b>
Description	Owner of a discussion thread or post can select a reply as solution among all the replies to that thread.
Stakeholders	Students, Instructors, Admins

<b>FR-24</b>	<b>Create &amp; Manage Course Announcement</b>
Description	Instructors of a course can create & manage announcements to a course. Admins can also perform this action.
Stakeholders	Instructors, Admins

<b>FR-25</b>	<b>Give Rating &amp; Review to a Course</b>
Description	Enrolled students can give rating and review to the course.
Stakeholders	Students

<b>FR-26</b>	<b>Add Instructors</b>
Description	Instructors of a course and all admins can add other instructor to the course.
Stakeholders	Instructors, Admins

<b>FR-27</b>	<b>Leave Course</b>
Description	An instructor of a course can leave from the course at any time only if there is more than one instructor.
Stakeholders	Instructors, Admins

<b>FR-28</b>	<b>Create &amp; Manage Categories</b>
Description	Admins can create & manage categories.
Stakeholders	Admins

<b>FR-28</b>	<b>Create &amp; Manage Institutions</b>
Description	Admins can create & manage institutions.
Stakeholders	Admins

<b>FR-29</b>	<b>Assigning Institution</b>
Description	Admins can assign a course to an existing institution.
Stakeholders	Admins

<b>FR-30</b>	<b>Assigning Institution</b>
Description	Admins can assign a course to an existing institution.
Stakeholders	Admins

## 2.2 Non-Functional Requirements (NFR):

Non-Functional requirements ensure the system is secured, reliable, maintainable, scalable and performing efficiently. The non-functional requirements of the system are described below:

<b>NFR-1</b>	<b>Student Progress Report</b>
Description	Instructors of a course can view total obtained marks, average obtained marks, course progress of all enrolled students. Admins can also perform this action.
Stakeholders	Instructors, Admins

<b>NFR-2</b>	<b>Issue Course Certificate</b>
Description	Instructors of a course which is assigned to an institution can issue course certificate for students who have completed the course with required marks. The institution will be the certificate provider authority. Admins can also perform this action.
Stakeholders	Instructors, Admins

<b>NFR-3</b>	<b>Download Course Certificate</b>
Description	Students can download course certificate issued for them.
Stakeholders	Students

<b>NFR-4</b>	<b>Course Recommendation</b>
Description	Students will get course recommendations on their dashboard based on their education level & interests.
Stakeholders	Students

<b>NFR-5</b>	<b>Advanced Course Search</b>
Description	Students will be able to filter course search results based on category, level, difficulty, fee etc. factors.
Stakeholders	Students, Guests

<b>NFR-6</b>	<b>Take Notes</b>
Description	A student can take notes for a specific content of a course which will be stored in the system & can only accessed by him/her.
Stakeholders	Students

<b>NFR-7</b>	<b>Document Viewer</b>
Description	Students will be able to read documents inside the application but will not be able to download if specified by the instructors which will reduce piracy.
Stakeholders	Students

<b>NFR-8</b>	<b>Plagiarism Check</b>
Description	Descriptive assessments will be checked for plagiarism & will not be accepted if it does not meet the criteria specified.
Stakeholders	Students

<b>NFR-9</b>	<b>Notification System</b>
Description	The system will notify users for important activities through email and on-site notifications.
Stakeholders	Students, Instructors, Admins

<b>NFR-10</b>	<b>Browser Support</b>
Description	The platform will support all popular browsers: Chrome, Firefox, Edge, Safari, Opera etc.
Stakeholders	Students, Instructors, Admins, Guests

<b>NFR-11</b>	<b>Device Responsive</b>
Description	The platform will be fully responsive for different types of devices: Cell Phone, Tabs, Laptops, Desktops.
Stakeholders	Students, Instructors, Admins, Guests

<b>NFR-12</b>	<b>Bangla User-Interface</b>
Description	The platform will have full Bangla User Interface.
Stakeholders	Students, Instructors, Admins, Guests

## 2.3 Use-Case Diagrams

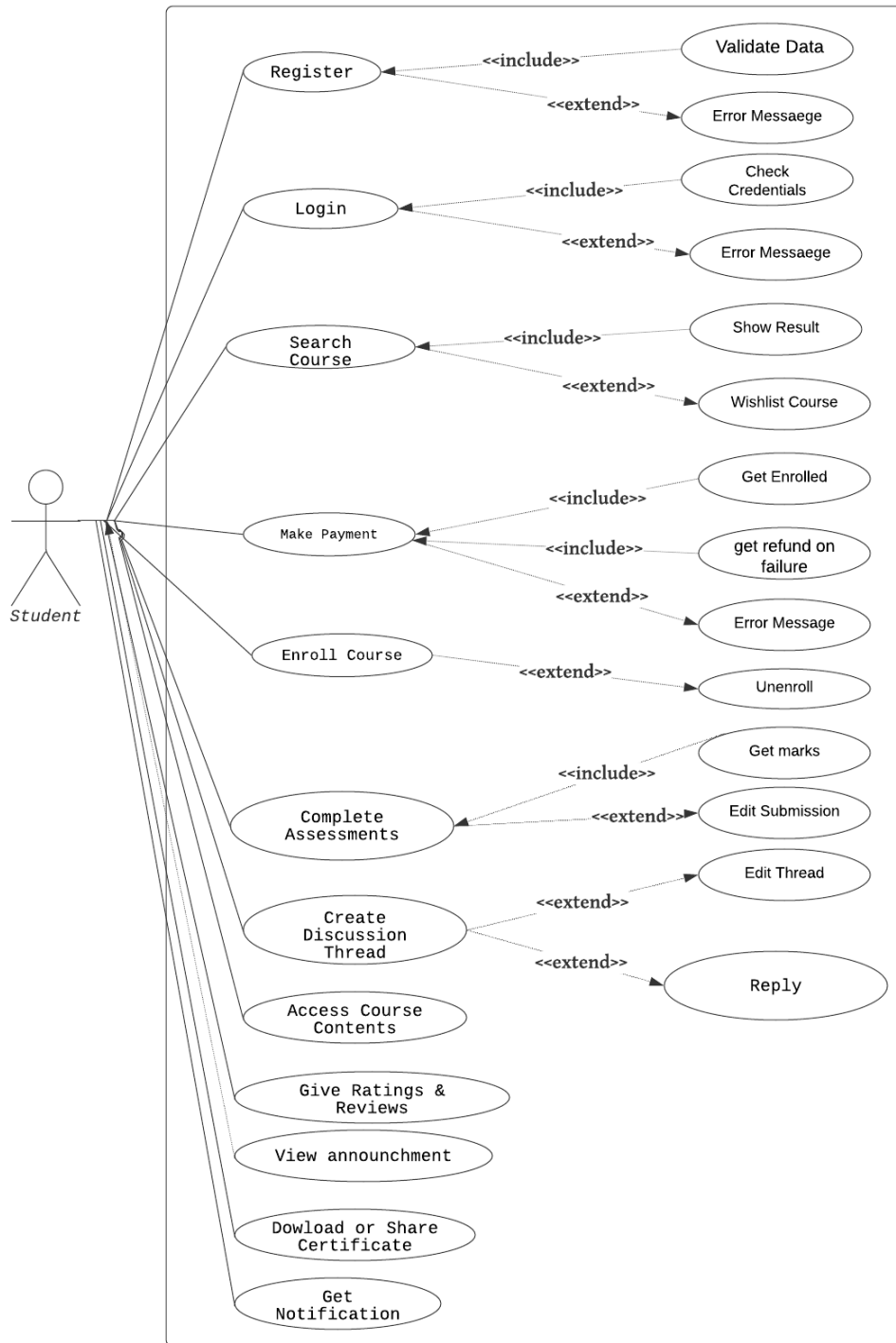


Figure 2.3.1: Use-Case Diagram (Student)

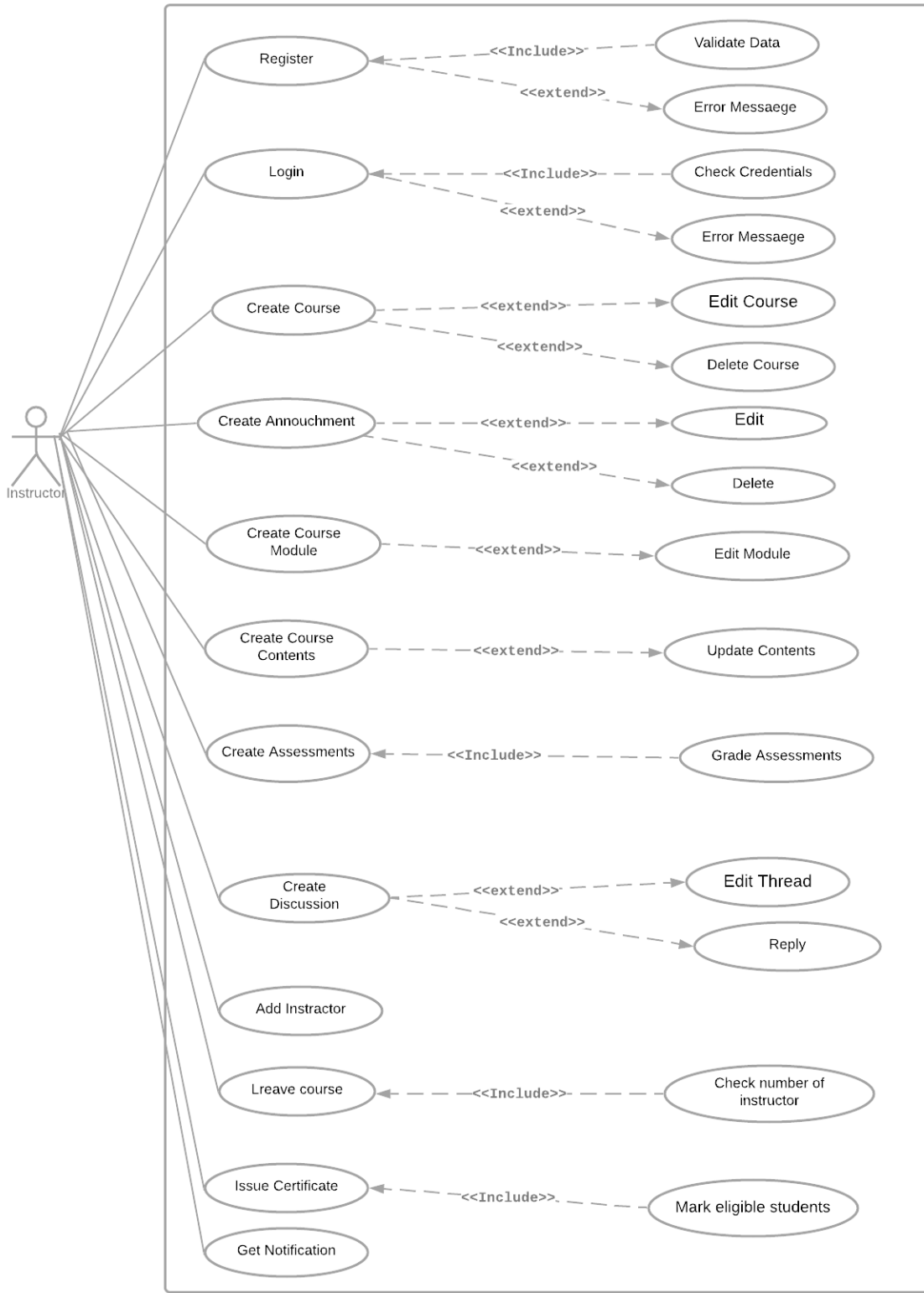


Figure 2.3.2: Use-Case Diagram (Instructor)

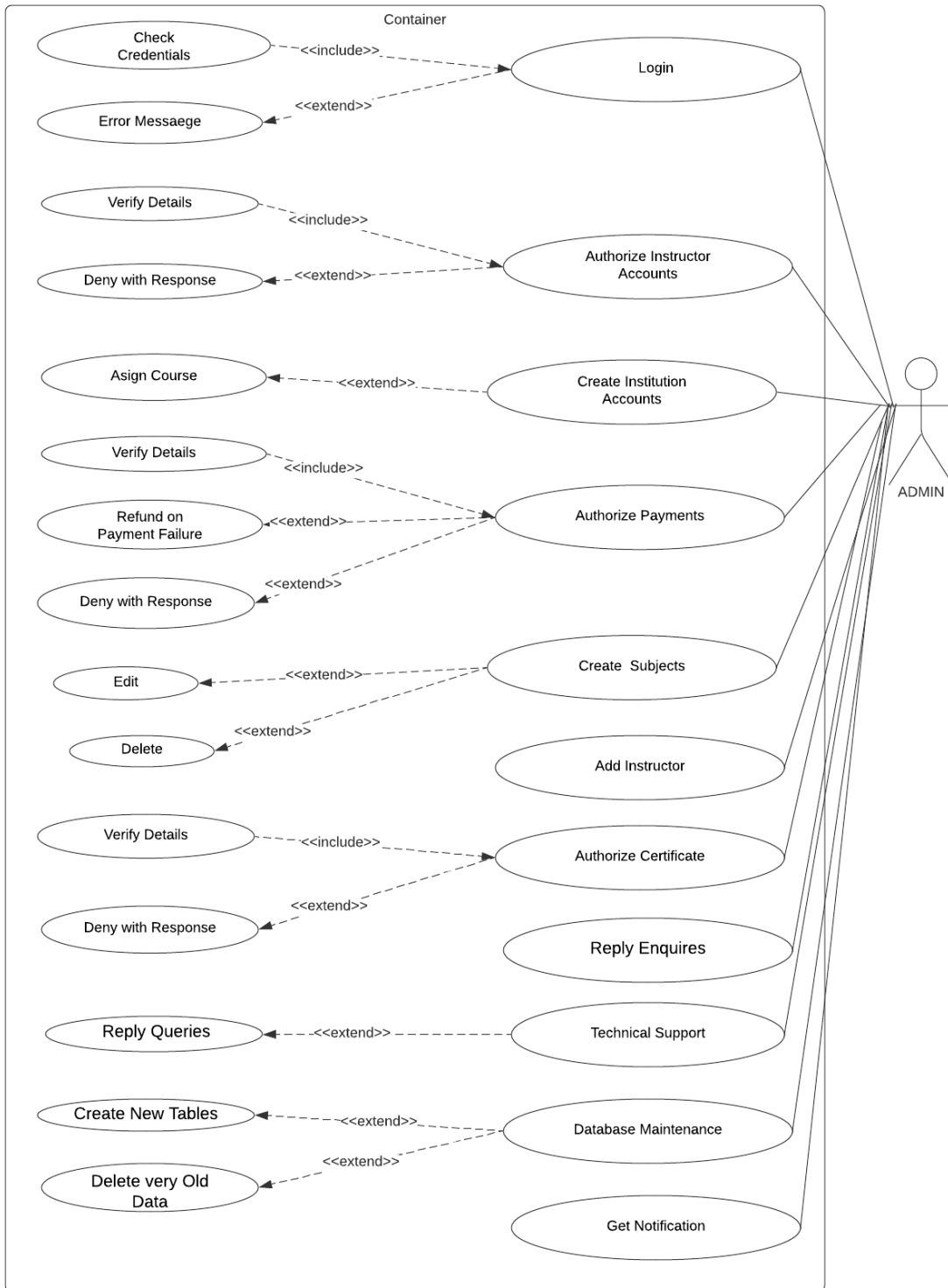


Figure 2.3.3: Use-Case Diagram (Admin)

## 2.4 Use-Cases of the System

### 2.4.1 Registration

<b>Use Case ID</b>	UC-1
<b>Use Case Title</b>	Registration
<b>Actors</b>	Students, Instructors
<b>Precondition</b>	Access Home Page of the web application
<b>Flow of Events</b>	<ol style="list-style-type: none"><li>1. In the home page user clicks the Registration button</li><li>2. Registration form loads</li><li>3. User fills up the form with valid information</li><li>4. User submits the form</li><li>5. System notifies the user of registration success &amp; redirects to dashboard</li></ol>
<b>Exit Condition</b>	A new User has been registered to the system
<b>Post Condition</b>	User can later update his profile & change password
<b>Alternate Events</b>	<ul style="list-style-type: none"><li>• System gives validation error if user does not give valid data in registration form or does not fill a required field</li><li>• System redirects user to login page if user tries to access a page which cannot be accessed by unauthenticated user.</li></ul>

### 2.4.2 Login

<b>Use Case ID</b>	UC-2
<b>Use Case Title</b>	Login
<b>Actors</b>	Students, Instructors, Admins
<b>Precondition</b>	Must have an account
<b>Flow of Events</b>	<ol style="list-style-type: none"><li>1. In the home page user clicks the Login button</li><li>2. Login form loads</li><li>3. User fills up the form with valid information</li><li>4. User submits the form</li></ol>



	5. User is redirected to dashboard
<b>Exit Condition</b>	User has been logged in

### 2.4.3 Create Course

<b>Use Case ID</b>	UC-3
<b>Use Case Title</b>	Create Course
<b>Actors</b>	Instructors, Admins
<b>Precondition</b>	Instructor must be logged in to the system
<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. To create a course, click the create button from the dashboard</li> <li>2. Course creation form loads, Instructor will fill up all the required details</li> <li>3. User submits the form</li> <li>4. If all data entered is valid then the course will be created, and instructor can see the preview of the course</li> </ol>
<b>Exit Condition</b>	A new Course has been created
<b>Post Condition</b>	Instructor will be able to edit or delete course later

### 2.4.4 Create Course Module

<b>Use Case ID</b>	UC-4
<b>Use Case Title</b>	Create Course module
<b>Actors</b>	Instructors, Admins
<b>Precondition</b>	Course must exist
<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. User will enter the course dashboard</li> <li>2. User will click create module dropdown</li> <li>3. Create module form loads</li> <li>4. Instructor will select module category</li> <li>5. Instructor will name the module</li> <li>6. Instructor submits the form</li> <li>7. If the instructor gives all the valid data, system notifies the user of module creation success &amp; redirects to dashboard</li> </ol>
<b>Exit Condition</b>	A new Course Module has been created

<b>Post Condition</b>	Instructor can later change or update module
-----------------------	--

#### 2.4.5 Create Content

<b>Use Case ID</b>	UC-5
<b>Use Case Title</b>	Create Course Contents
<b>Actors</b>	Instructors, Admins
<b>Precondition</b>	Module must previously exist
<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. User will click create content dropdown under a module in the course dashboard</li> <li>2. System will show the content creation form</li> <li>3. The system will show what type of content the instructor wants to upload like text, lecture video, link or file</li> <li>4. From this option instructor will select it through drop down button</li> <li>5. If the content is a text lesson, then he must write the text field</li> <li>6. If the content is a video, then system will show the option paste the YouTube video link or to upload a video</li> <li>7. If it is a file, system will show the option of file upload</li> <li>8. If the instructor fills the form and presses the submit button, his content will be created</li> </ol>
<b>Exit Condition</b>	A new Content has been created
<b>Post Condition</b>	Instructor can later upload, delete or add contents.

#### 2.4.6 Create Assessment

<b>Use Case ID</b>	UC-6
<b>Use Case Title</b>	Create Assessment
<b>Actors</b>	Instructors, Admins
<b>Precondition</b>	Course module must exist

<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. User will click create assessment dropdown under a module in the course dashboard</li> <li>2. System will show the instructor the form to create an assessment</li> <li>3. User will select the type of assessment the wants through the dropdown like MCQ, short question or descriptive</li> <li>4. User will fill &amp; submit the form</li> <li>5. The assessment will be created</li> </ol>
<b>Exit Condition</b>	A new Assessment has been created
<b>Post Condition</b>	Instructor can later modify assessments

#### 2.4.7 Create Question

<b>Use Case ID</b>	UC-7
<b>Use Case Title</b>	Create Question
<b>Actors</b>	Instructors, Admins
<b>Precondition</b>	Assessment must exist
<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. User will visit an assessment page by clicking assessment title from course dashboard</li> <li>2. System will show the instructor the form to create an assessment</li> <li>3. User will select the type of assessment the wants through the dropdown like MCQ, short question or descriptive</li> <li>4. User will fill &amp; submit the form</li> <li>5. The assessment will be created</li> </ol>
<b>Exit Condition</b>	A new Question has been created
<b>Post Condition</b>	Instructor can later modify assessments

#### 2.4.8 Publish Assessment

<b>Use Case ID</b>	UC-8
<b>Use Case Title</b>	Publish Assessment
<b>Actors</b>	Instructors, Admins
<b>Precondition</b>	<ul style="list-style-type: none"> <li>• Assessment must exist</li> <li>• At least one question must exist in the assessment</li> </ul>

<b>Flow of Events</b>	1. User will visit an assessment page by clicking assessment title from course dashboard 2. User will click the publish button
<b>Exit Condition</b>	Assessment has been published
<b>Post Condition</b>	Students can now view & submit the assessment

#### 2.4.9 Search Courses

<b>Use Case ID</b>	UC-9
<b>Use Case</b>	Search Courses
<b>Actors</b>	Students
<b>Precondition</b>	Student must visit the website
<b>Flow of Events</b>	1. Student will see the search option after entering the website 2. Student can search courses by course title, category or topic 3. Student input the search string in search box and click the inline search button or press enter 4. The search results will be shown in a new page
<b>Exit Condition</b>	Search results has been displayed
<b>Post Condition</b>	Students can enroll courses or wishlist for later from the search results

#### 2.4.10 Wishlist Course

<b>Use Case ID</b>	UC-10
<b>Use Case Title</b>	Wishlist Course
<b>Actors</b>	Students
<b>Precondition</b>	Student must be logged in

<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. Student will find course to wishlist by either of the following options <ol style="list-style-type: none"> <li>a. Visit website &amp; click courses link from header</li> <li>b. Search for courses</li> </ol> </li> <li>2. Student will click the wishlist button in the desired course card</li> <li>3. Course will be wishlisted with success message</li> </ol>
<b>Exit Condition</b>	Course has been wishlisted
<b>Post Condition</b>	Students can find wishlisted courses from dropdown under username on header

#### 2.4.11 Enroll Course

<b>Use Case ID</b>	UC-11
<b>Use Case Title</b>	Enroll Course
<b>Actors</b>	Students
<b>Precondition</b>	Student must be logged in
<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. Student will find course to enroll by either of the following options <ol style="list-style-type: none"> <li>a. Visit website &amp; click courses link from header</li> <li>b. Search for courses</li> </ol> </li> <li>2. Student will click the enroll button in the desired course card or in course details page</li> <li>3. If the course is paid, student must pay the course fee, system will automatically open the payment page</li> <li>4. Course will be enrolled with success message &amp; course dashboard will be shown</li> </ol>
<b>Exit Condition</b>	Student has been enrolled into the course
<b>Post Condition</b>	Students can access all the course materials through course dashboard

#### 2.4.12 Payment

<b>Use Case ID</b>	UC-12
--------------------	-------

<b>Use Case Title</b>	Payment
<b>Actors</b>	Students
<b>Precondition</b>	Student must be logged in
<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. Student attempting to enroll paid course will automatically taken to the payment page</li> <li>2. Student can choose between international cards or mobile banking as payment method. Mobile banking will be chosen by default</li> <li>3. Student will see payment information above the payment form &amp; will pay course fee from mobile banking account to the given accounts manually</li> <li>4. The payment details(account no, method, transaction ID, amount) must be given through the form shown in the page</li> <li>5. After submitting the form, student will have to wait for the payment to be verified by Admins. The system will notify the status &amp; course dashboard link if verified through email and on-site notifications.</li> </ol>
<b>Alternate Events</b>	<ol style="list-style-type: none"> <li>1. Student attempting to enroll paid course will be automatically taken to the payment page</li> <li>2. Student will choose between international cards as payment method</li> <li>3. Student will directly pay through the payment gateway integrated into the application</li> <li>4. If payment completes successfully then the student will be enrolled to the course &amp; will be redirected to the course dashboard with success message</li> </ol>
<b>Exit Condition</b>	Payment has been received
<b>Post Condition</b>	Payment will be verified and if so student will be notified and can access all the course materials through course dashboard

#### 2.4.13 Verify Payment

<b>Use Case ID</b>	UC-13
<b>Use Case Title</b>	Verify Payments

<b>Actors</b>	Admins
<b>Precondition</b>	Admin must be logged in
<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. The Admin will click on Payments link from the dashboard</li> <li>2. All the payments will be shown inside a table</li> <li>3. There will present verify button on the rows of payments pending for verification</li> <li>4. The admin will verify the payments by clicking on the verify button if the data matches the payment details</li> <li>5. The student will be enrolled into the course, notification &amp; email with course dashboard link will be sent to the student</li> </ol>
<b>Exit Condition</b>	Payment has been verified
<b>Alternate Events</b>	<ol style="list-style-type: none"> <li>1. The Admin will click on Payments link from the dashboard</li> <li>2. All the payments will be shown inside a table</li> <li>3. There will present reject button on the rows of payments pending for verification</li> <li>4. The admin will reject the payments by clicking on the reject button if the data matches the payment details</li> <li>5. Rejection notification will be sent to the student</li> </ol>

#### 3.4.14 Access Course Contents

<b>Use Case ID</b>	UC-14
<b>Use Case Title</b>	Access Course Contents
<b>Actors</b>	Students
<b>Precondition</b>	<ul style="list-style-type: none"> <li>• Student must be enrolled in the course</li> <li>• Student must be logged in</li> </ul>
<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. Student can find all enrolled courses in the dashboard</li> <li>2. If student clicks on the resume button on the course card, system will redirect him to the course dashboard</li> <li>3. From there students can select contents, assessments to view or go to the course discussion panel</li> </ol>
<b>Exit Condition</b>	Student can access all course materials through Course Dashboard

<b>Post Condition</b>	Students will be able to watch lecture videos, view contents, take notes and complete assessments, post in course discussion panel
-----------------------	--

#### 2.4.15 Submit Assessment

<b>Use Case ID</b>	UC-15
<b>Use Case Title</b>	Submit Assessment
<b>Actors</b>	Students
<b>Precondition</b>	<ul style="list-style-type: none"> <li>• Student must be enrolled in the course</li> <li>• The assessment deadline must not be expired</li> <li>• Student must be logged in</li> </ul>
<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. Student can find all enrolled courses in the dashboard</li> <li>2. If student clicks on the resume button on the course card, system will redirect him to the course dashboard</li> <li>3. From there students can select an assessment</li> <li>4. All questions of the assessment and instructions will be shown in a new page</li> <li>5. Student can submit answer(s) for questions one by one</li> </ol>
<b>Exit Condition</b>	Assessment has been submitted
<b>Post Condition</b>	MCQ's will be graded automatically while submit, other types of questions will be manually graded by the course instructors. Once graded, student can see his/her obtained marks below each question

#### 2.4.16 Grade Assessment

<b>Use Case ID</b>	UC-16
<b>Use Case Title</b>	Grade Assessments
<b>Actors</b>	Instructors
<b>Precondition</b>	Submission must exist for grading



<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. Instructor will visit an assessment page by clicking assessment title from course dashboard</li> <li>2. Instructor will click responses button under a question</li> <li>3. All student responses or submissions will be shown</li> <li>4. Instructor will input marks in input field &amp; click the grade button to grade a submission or response</li> <li>5. The response will be graded</li> </ol>
<b>Exit Condition</b>	Assessment has been graded
<b>Post Condition</b>	Obtained marks will be visible to the corresponding students

#### 2.4.17 Submit Assessment

<b>Use Case ID</b>	UC-17
<b>Use Case Title</b>	Create Discussion Panel Thread or Post
<b>Actors</b>	Instructors, Students, Admins
<b>Precondition</b>	<ul style="list-style-type: none"> <li>• Student trying to post on course discussion panel must be enrolled into the course</li> <li>• Instructor trying to post on course discussion panel must own the course</li> <li>• Users must be logged in</li> </ul>
<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. Instructors of the course &amp; enrolled students can find the course in their dashboard</li> <li>2. Clicking resume button on course card will take them to the course dashboard, Admin can go to the course dashboard by finding the course from all courses page or by searching and clicking resume button on course card</li> <li>3. In course dashboard, the open discussion panel button will take users to the discussion panel</li> <li>4. Clicking the new post button below the list of all posts will take user to post creation page</li> <li>5. User can optionally select a course content or assessment related to which his/her query is</li> <li>6. User needs to fill up the form with other details: post title, description etc. and submit the form</li> <li>7. User will be redirected to the page containing the full post with success message</li> </ol>
<b>Exit Condition</b>	A new Discussion Panel Thread has been created

<b>Post Condition</b>	<ul style="list-style-type: none"> <li>• Users can reply to the new post</li> <li>• Post owner can edit or delete the post</li> </ul>
-----------------------	---

#### 2.4.18 Reply to Discussion Threads

<b>Use Case ID</b>	UC-18
<b>Use Case Title</b>	Reply to Discussion Threads
<b>Actors</b>	Instructors, Students, Admins
<b>Precondition</b>	<ul style="list-style-type: none"> <li>• Student trying to reply to a post in course discussion panel must be enrolled into the course</li> <li>• Instructor trying to reply to a post in course discussion panel must own the course</li> <li>• Users must be logged in</li> </ul>
<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. Instructors of the course &amp; enrolled students can find the course in their dashboard</li> <li>2. Clicking resume button on course card will take them to the course dashboard, Admin can go to the course dashboard by finding the course from all courses page or by searching and clicking resume button on course card</li> <li>3. In course dashboard, the open discussion panel button will take users to the discussion panel</li> <li>4. Clicking a post title among the list of all posts will take user to post page</li> <li>5. Below the post description and previous replies, there will be a text area to write and reply button to submit the reply</li> <li>6. User will see his/her reply on the page &amp; success message</li> </ol>
<b>Exit Condition</b>	A new reply to the Discussion Panel Thread has been created
<b>Post Condition</b>	<ul style="list-style-type: none"> <li>• Reply owner can edit or delete the reply later</li> <li>• Post owner can mark the reply as solution</li> </ul>

#### 2.4.19 Submit Assessment

<b>Use Case ID</b>	UC-19
<b>Use Case Title</b>	Mark Reply as Solution
<b>Actors</b>	Instructors, Students, Admins

<b>Precondition</b>	<ul style="list-style-type: none"> <li>• User must own the original post the reply belongs to mark it as solution</li> <li>• User must be logged in</li> </ul>
<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. Instructors of the course &amp; enrolled students can find the course in their dashboard</li> <li>2. Clicking resume button on course card will take them to the course dashboard, Admin can go to the course dashboard by finding the course from all courses page or by searching and clicking resume button on course card</li> <li>3. In course dashboard, the open discussion panel button will take users to the discussion panel</li> <li>4. Clicking a post title among the list of all posts will take user to post page</li> <li>5. Below the post description all the previous replies will be visible</li> <li>6. User can click the mark as solution dropdown on the desired reply to mark it as solution</li> </ol>
<b>Exit Condition</b>	Assessment has been submitted
<b>Post Condition</b>	<ul style="list-style-type: none"> <li>• The original post will be also be marked as solved in discussion panel</li> <li>• Post owner can select only one reply as solution for a specific post</li> </ul>

#### 2.4.20 Rate/Review Course

<b>Use Case ID</b>	UC-20
<b>Use Case Title</b>	Rate/Review Course
<b>Actors</b>	Students
<b>Precondition</b>	<ul style="list-style-type: none"> <li>• Student must be enrolled into the course he/she wants to rate/review</li> <li>• Student must be logged in</li> </ul>
<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. Enrolled courses can be found in students' dashboard</li> <li>2. Clicking resume button on course card will take the student to the course dashboard</li> <li>3. On course dashboard there will be a function button (gear icon) which will reveal some dropdown links</li> <li>4. Clicking the rate/review link will take the student to the rate/review page</li> </ol>

	5. Student can give rating based on 10 and optionally can write a review
<b>Exit Condition</b>	Rating and Review has been stored
<b>Post Condition</b>	The average rating is shown in both course card on all courses page and course details page of the course. The reviews can be found on the course details page at the bottom

#### 2.4.21 Download Certificate

<b>Use Case ID</b>	UC-21
<b>Use Case Title</b>	Download Certificate
<b>Actors</b>	Students
<b>Precondition</b>	<ul style="list-style-type: none"> <li>• Student must be enrolled into the course</li> <li>• Student must complete the course with required total marks</li> <li>• Student must rate/review the course before download the certificate</li> </ul>
<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. Enrolled courses can be found in student's dashboard</li> <li>2. Clicking resume button on course card will take the student to the course dashboard</li> <li>3. On the course dashboard there will be a new section containing the download certificate button</li> <li>4. Clicking the button will download the certificate as pdf file. If the student has not yet rated the course he will be redirected to rating/review page and will be required to click the button again.</li> </ol>
<b>Exit Condition</b>	Certificate has been downloaded to the student's device

#### 2.4.22 Create Category

<b>Use Case ID</b>	UC-22
--------------------	-------

<b>Use Case Title</b>	Create Category
<b>Actors</b>	Admins
<b>Precondition</b>	Admin must be logged in
<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>5. The Admin will click on Categories link from the dashboard</li> <li>6. All the categories will be shown inside a table</li> <li>7. Below the table there will be a create button, clicking the button will take the admin to category creation page</li> <li>8. Admin will fill the form with required details &amp; submit</li> <li>9. The category will be created and the admin will be redirected to category page with success message</li> </ol>
<b>Exit Condition</b>	A new Category has been created
<b>Post Condition</b>	<ul style="list-style-type: none"> <li>• Admins can edit or delete the category later</li> <li>• Instructors or Admin can create courses in the new category</li> </ul>

#### 2.4.23 Create Institution

<b>Use Case ID</b>	UC-23
<b>Use Case Title</b>	Create Institution
<b>Actors</b>	Admins
<b>Precondition</b>	Admin must be logged in
<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. The Admin will click on Institutions link from the dashboard</li> <li>2. All the Institutions will be shown inside a table</li> <li>3. Below the table there will be a create button, clicking the button will take the admin to institution creation page</li> <li>4. Admin will fill the form with required details &amp; submit</li> <li>5. The institution will be created and the admin will be redirected to institutions page with success message</li> </ol>
<b>Exit Condition</b>	A new Institution has been created
<b>Post Condition</b>	<ul style="list-style-type: none"> <li>• Admin can edit or delete the institution later</li> <li>• Admin can assign courses to the new institution</li> </ul>

#### 2.4.24 Verify Instructor Accounts

<b>Use Case ID</b>	UC-24
<b>Use Case Title</b>	Verify Instructor Accounts
<b>Actors</b>	Admins
<b>Precondition</b>	<ul style="list-style-type: none"><li>• Admin must be logged in</li><li>• Instructor accounts pending for verification must exist</li></ul>
<b>Flow of Events</b>	<ol style="list-style-type: none"><li>1. The Admin will click on Instructors link from the dashboard</li><li>2. All the Instructors will be shown inside a table</li><li>3. On each row of the table there will be a details button (eye icon) present, clicking the button system will redirect to instructor profile page</li><li>4. If the instructor account is pending for verification, there will be a verify button</li><li>5. Clicking the verify button will verify the instructor account, notification and email will be sent to corresponding instructor to notify him/her</li></ol>
<b>Exit Condition</b>	Instructor Account has been verified
<b>Alternate Events</b>	<ol style="list-style-type: none"><li>1. The Admin will click on Instructors link from the dashboard</li><li>2. All the Instructors will be shown inside a table</li><li>3. On each row of the table there will be a delete button (trash icon) present</li><li>4. Clicking the button will delete the account of the corresponding instructor, Admins will perform action if they don't think the instructor is eligible to offer courses in the platform</li></ol>
<b>Post Condition</b>	The newly verified Instructor can now create courses or can be added to existing courses

#### 2.4.25 Add Instructor to Course

<b>Use Case ID</b>	UC-25
<b>Use Case Title</b>	Add Instructor to Course
<b>Actors</b>	Instructors, Admins
<b>Precondition</b>	<ul style="list-style-type: none"><li>• Admin must be logged in</li><li>• Instructor trying to add his associate must own the course</li></ul>

<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. The user will find the course</li> <li>2. On course details page or in the course dashboard there will be a function button (gear icon), clicking the button will reveal some dropdown links</li> <li>3. Clicking the add instructor link will take the user to a new page</li> <li>4. The page will contain form with an input field to give unique ID of the new instructor. This UUID can be found on each Instructors profile</li> <li>5. User will give the unique ID of the new instructor &amp; submit</li> <li>6. If the unique ID is valid, the new instructor will be added to the course and user will be redirected to the course details page with success message. Otherwise, the system will display validation error.</li> </ol>
<b>Exit Condition</b>	A new Instructor has been added to the Course
<b>Post Condition</b>	The newly added Instructor can now also manage the course

#### 2.4.26 View Unread Notifications

<b>Use Case ID</b>	UC-26
<b>Use Case Title</b>	View Unread Notifications
<b>Actors</b>	Students, Instructors, Admins
<b>Precondition</b>	User must be logged in
<b>Flow of Events</b>	<ol style="list-style-type: none"> <li>1. User will click the bell icon in the header</li> <li>2. A dropdown will be shown with only unread notifications</li> <li>3. Closing the dropdown will mark the notifications as read</li> </ol>
<b>Exit Condition</b>	Unread Notifications has been displayed & marked as read

#### 2.4.27 View All Notifications

<b>Use Case ID</b>	UC-27
<b>Use Case Title</b>	View All Notifications
<b>Actors</b>	Students, Instructors, Admins
<b>Precondition</b>	User must be logged in

<b>Flow of Events</b>	<ol style="list-style-type: none"><li>1. User will click the bell icon in the header</li><li>2. A dropdown will be shown where there will be a link to view all notifications</li><li>3. Clicking the link will take the User to a new page with all notifications</li></ol>
<b>Exit Condition</b>	All notifications has been displayed



# Chapter 3: System Design

System design is one of the most crucial parts of the software development life cycle (SDLC). It helps to translate business requirements into technical implementable module and design the system architecture which facilitates to develop the system with accuracy and efficiency. This chapter demonstrates the system design of the project.

## 3.1 Sequence Diagrams:

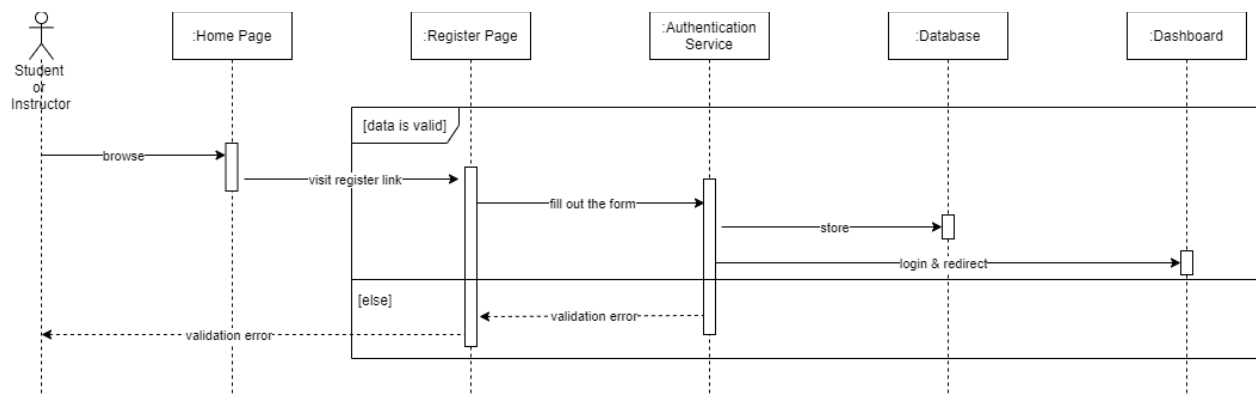


Figure 3.1.1: Sequence Diagram of Register

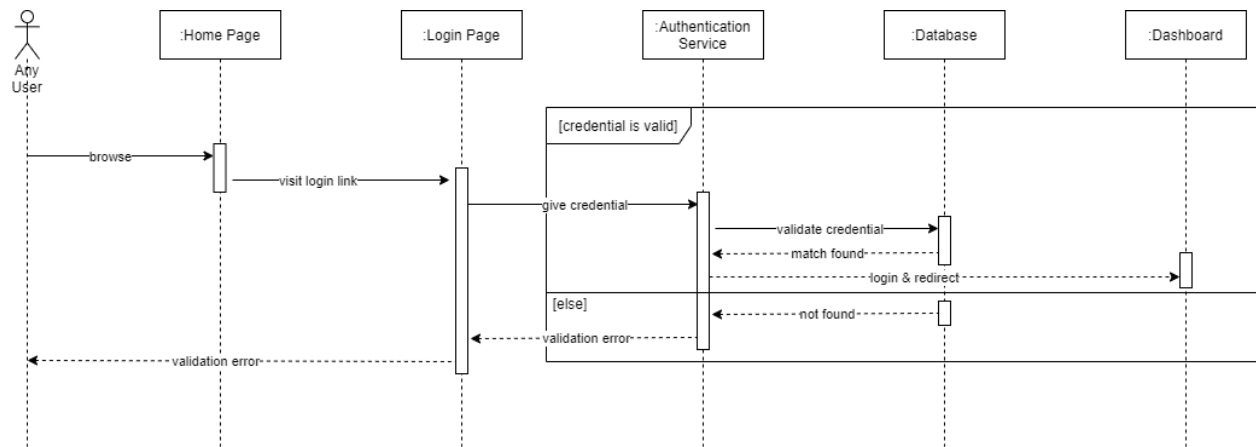


Figure 3.1.2: Sequence Diagram of Login

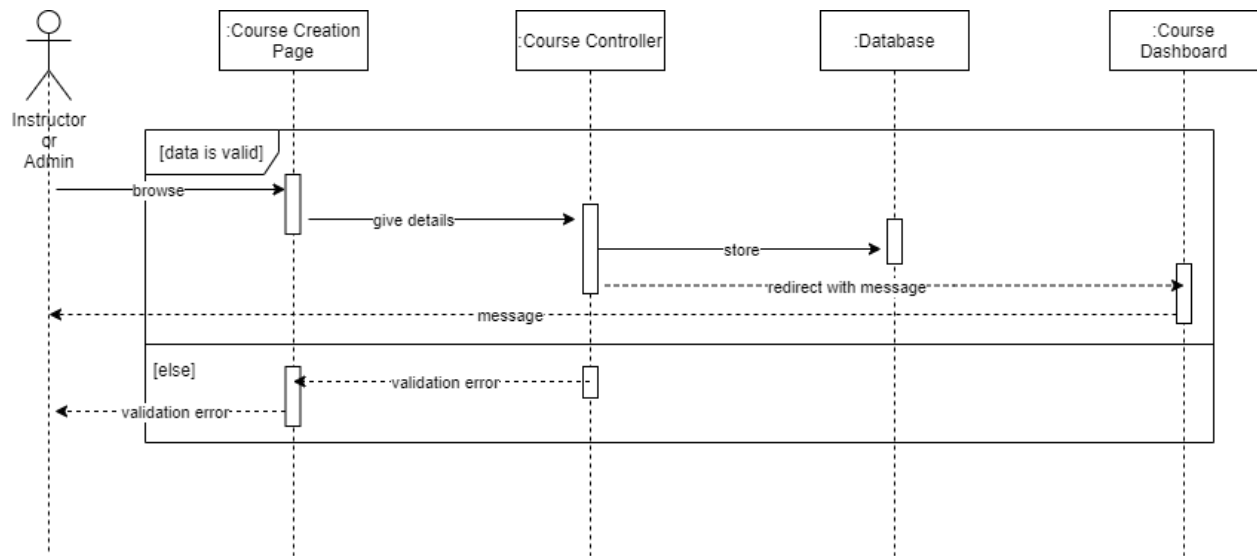


Figure 3.1.3: Sequence Diagram of Create Course

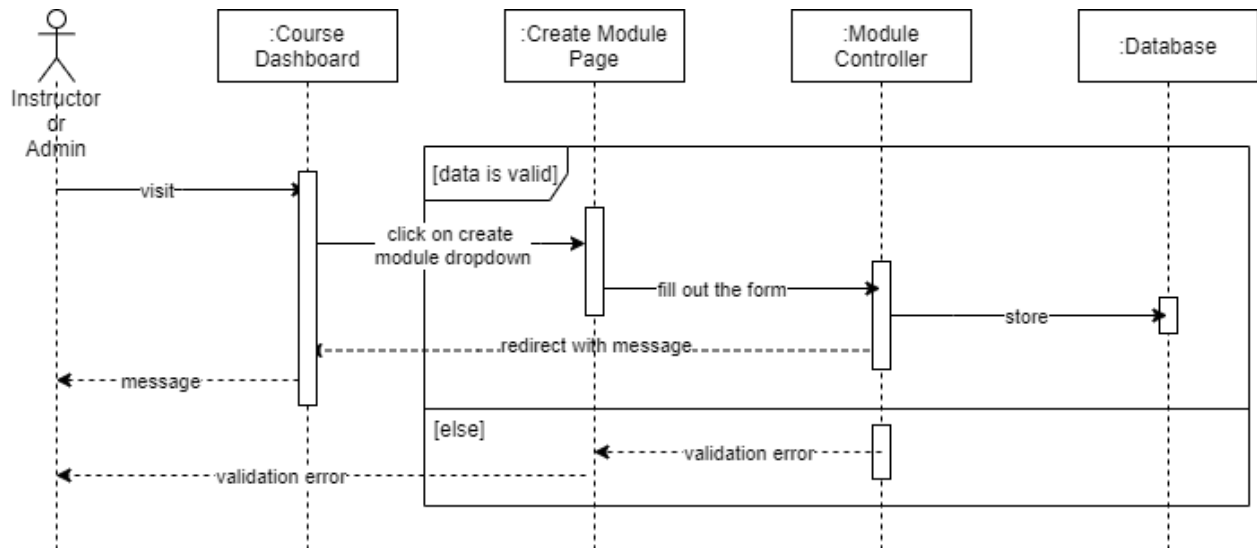


Figure 3.1.4: Sequence Diagram of Create Course Module

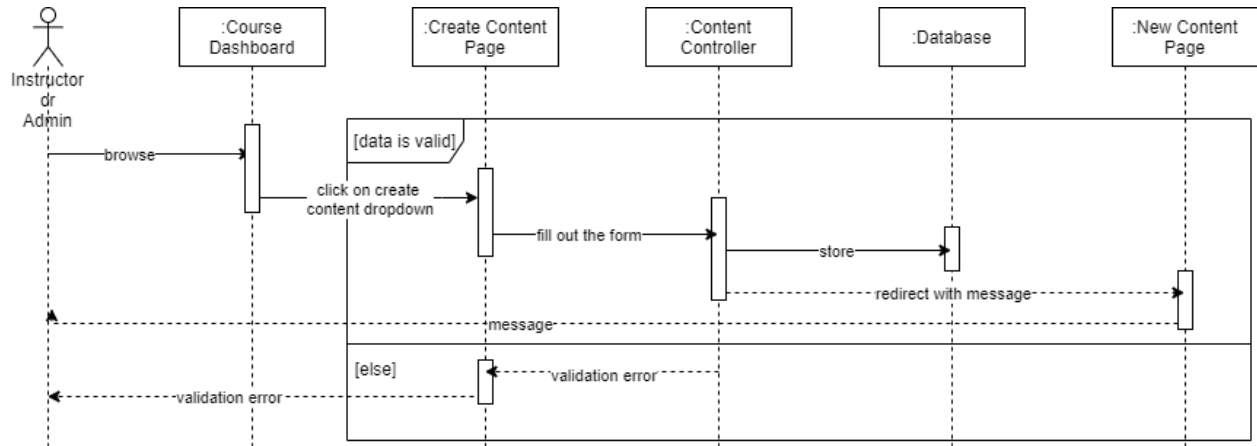


Figure 3.1.5: Sequence Diagram of Create Content

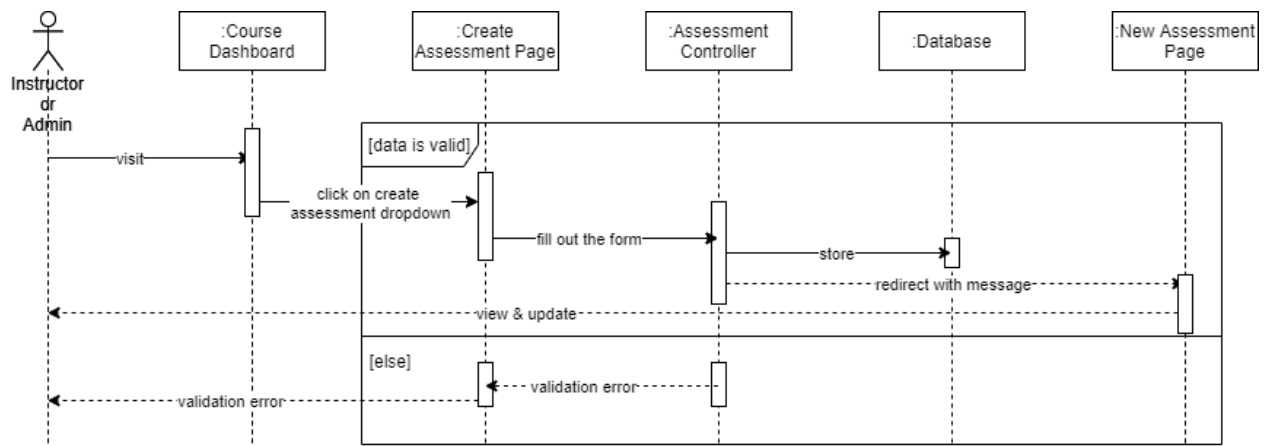


Figure 3.1.6: Sequence Diagram of Create Assessment

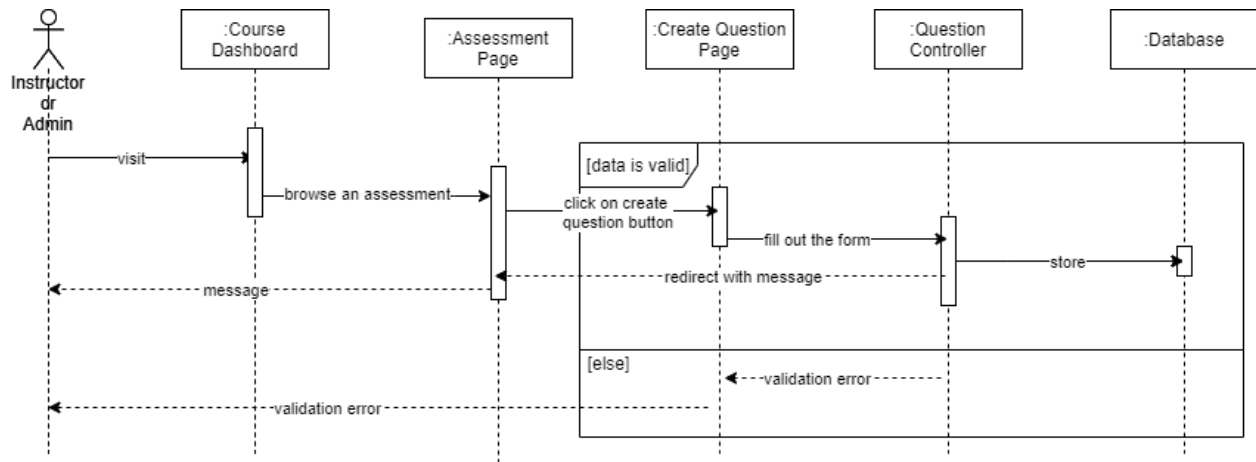


Figure 3.1.7: Sequence Diagram of Create Question

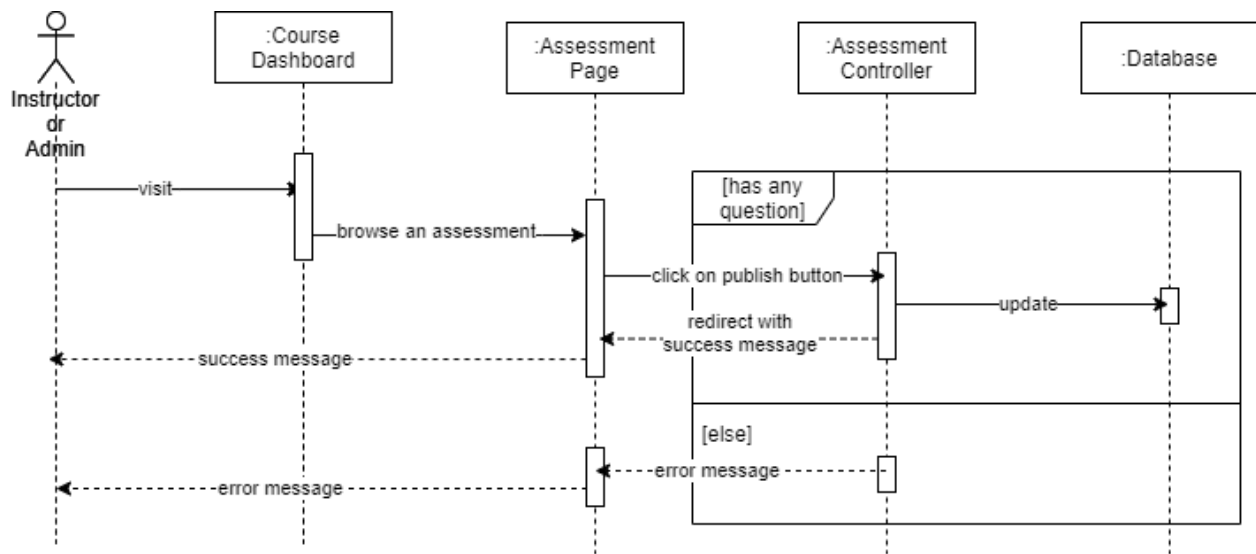


Figure 3.1.8: Sequence Diagram of Publish Assessment

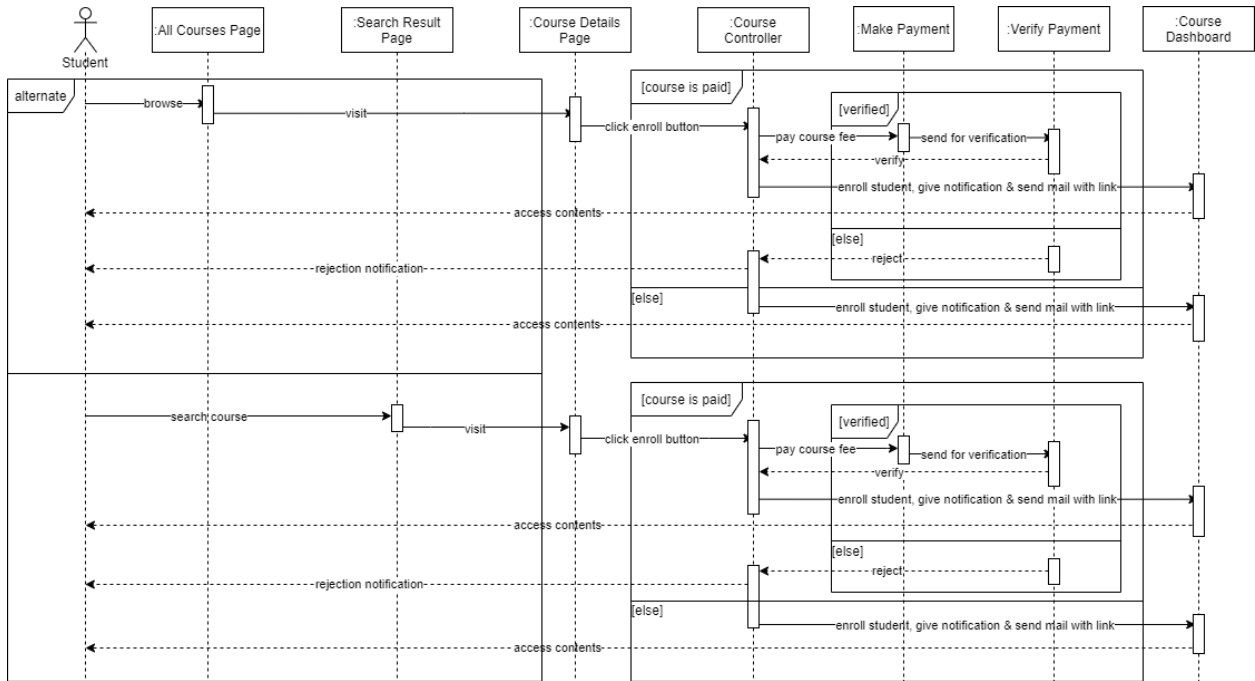


Figure 3.1.9: Sequence Diagram of Enroll Course

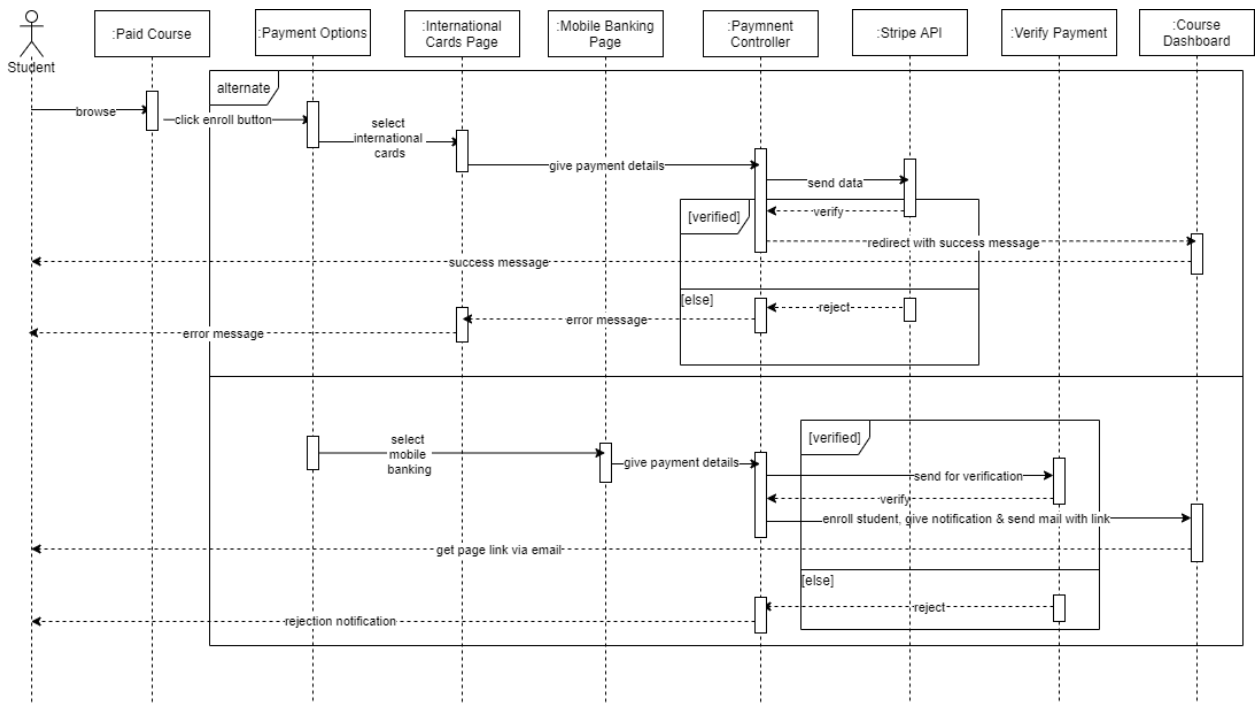


Figure 3.1.10: Sequence Diagram of Payment

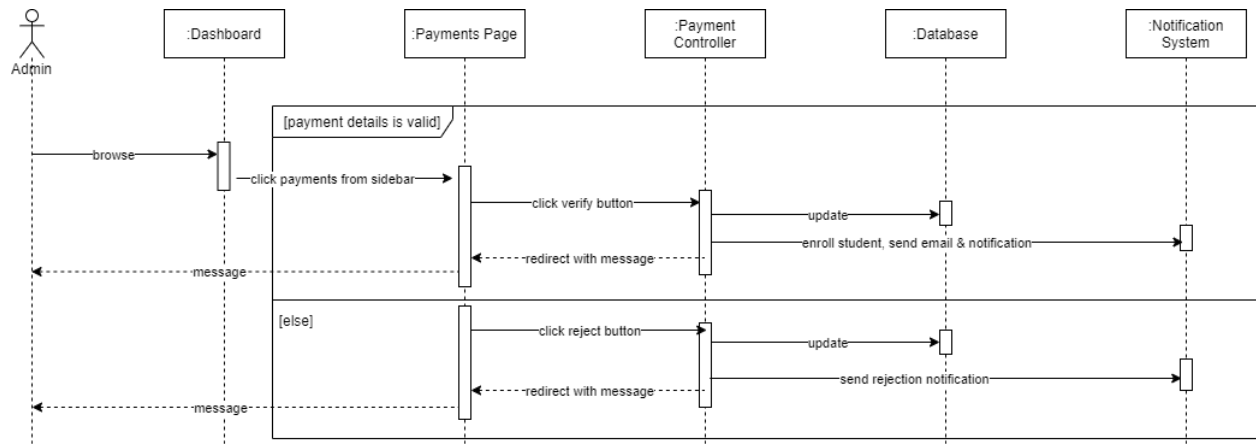


Figure 3.1.11: Sequence Diagram of Verify Payment

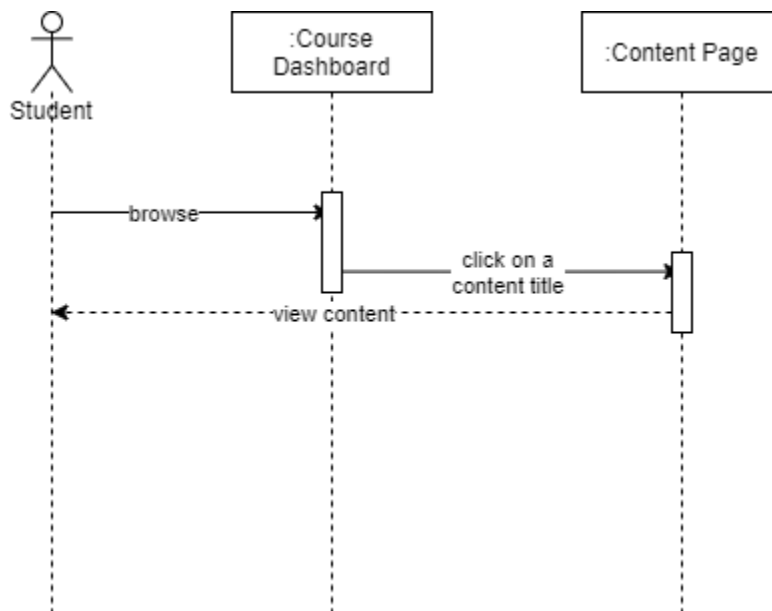


Figure 3.1.12: Sequence Diagram of Access Content

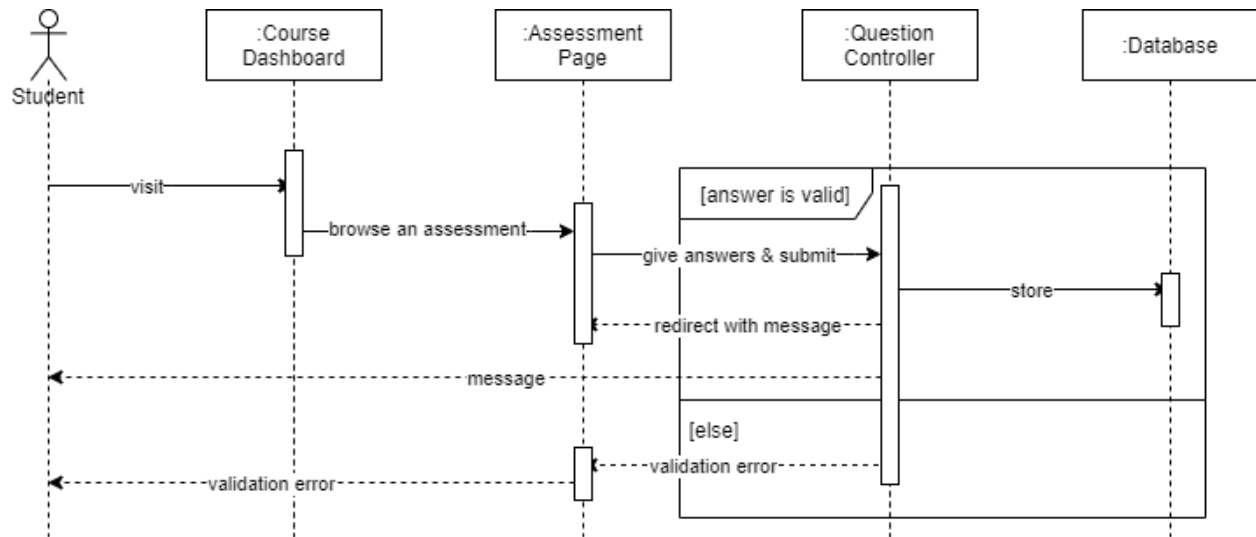


Figure 3.1.13: Sequence Diagram of Submit Assessment

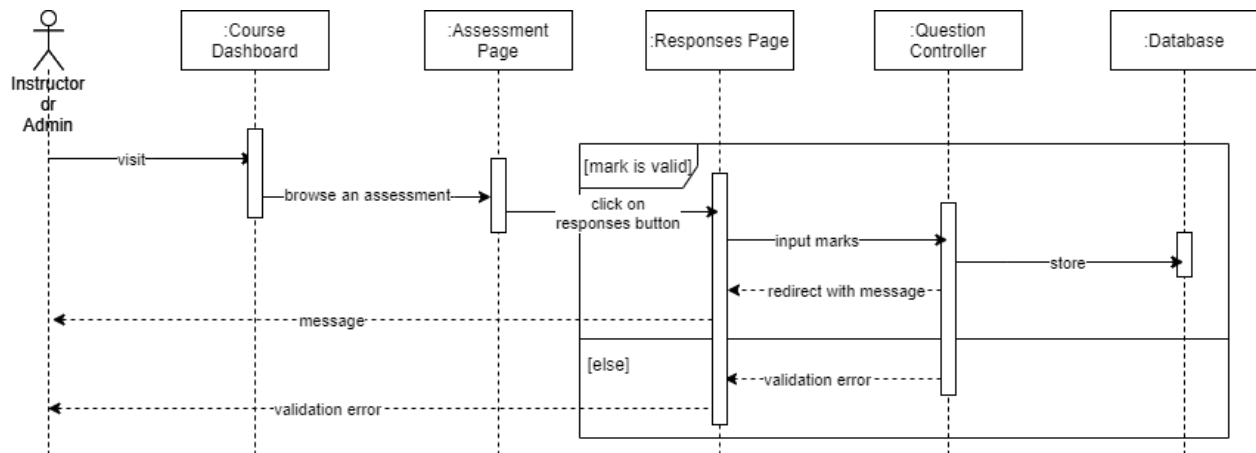


Figure 3.1.14: Sequence Diagram of Grade Assessment

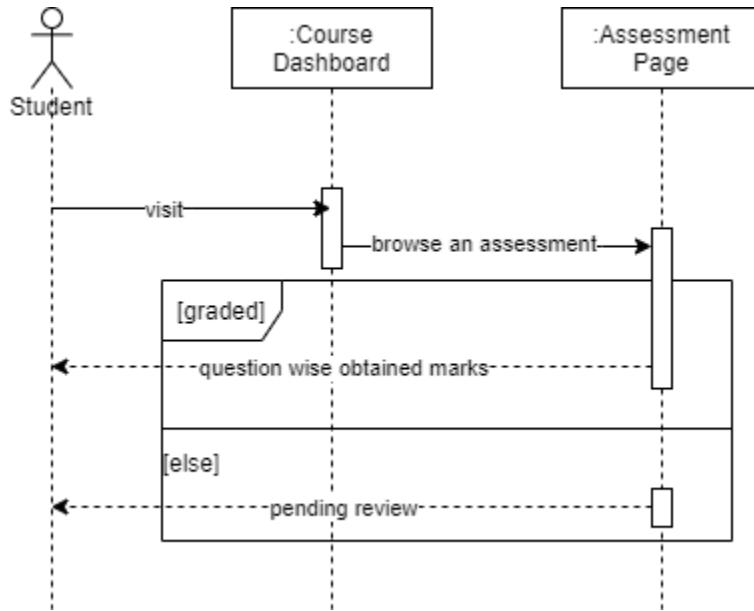


Figure 3.1.15: Sequence Diagram of View Obtained Marks

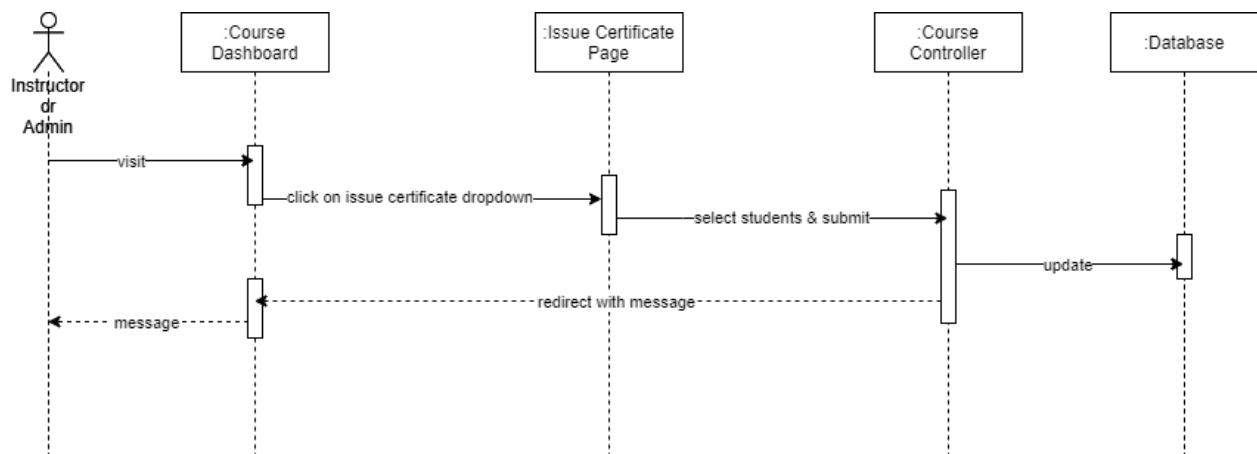


Figure 3.1.16: Sequence Diagram of Issue Certificate



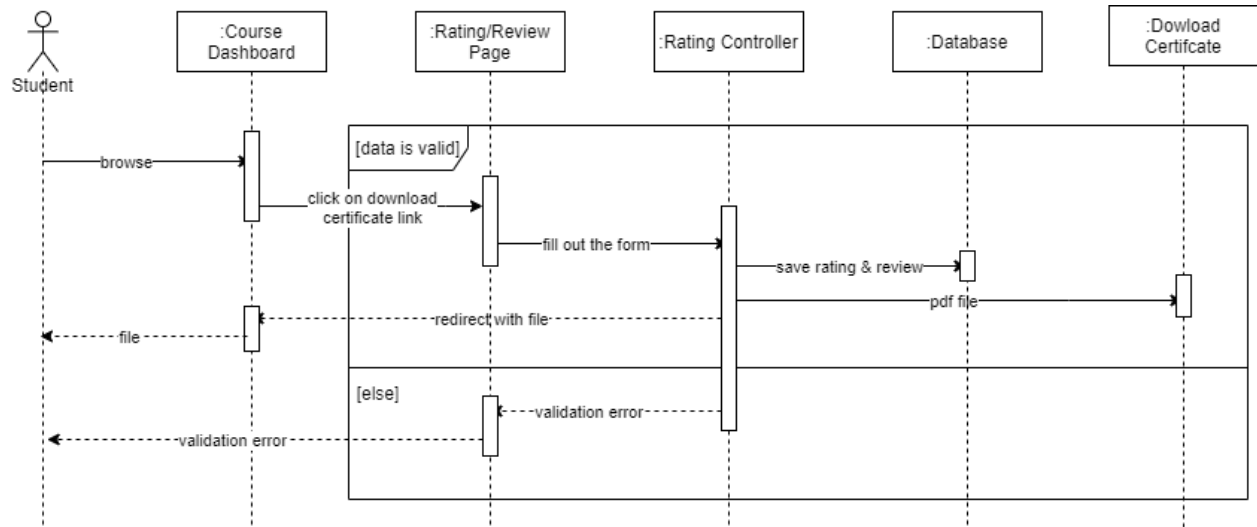


Figure 3.1.17: Sequence Diagram of Download Certificate

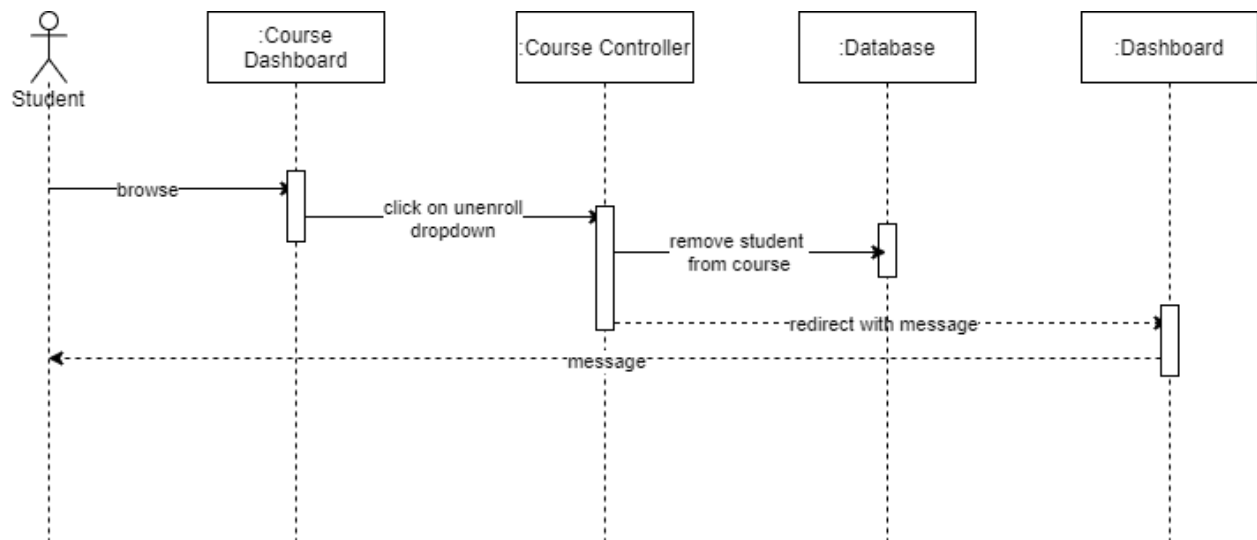


Figure 3.1.18: Sequence Diagram of Un-enroll Course

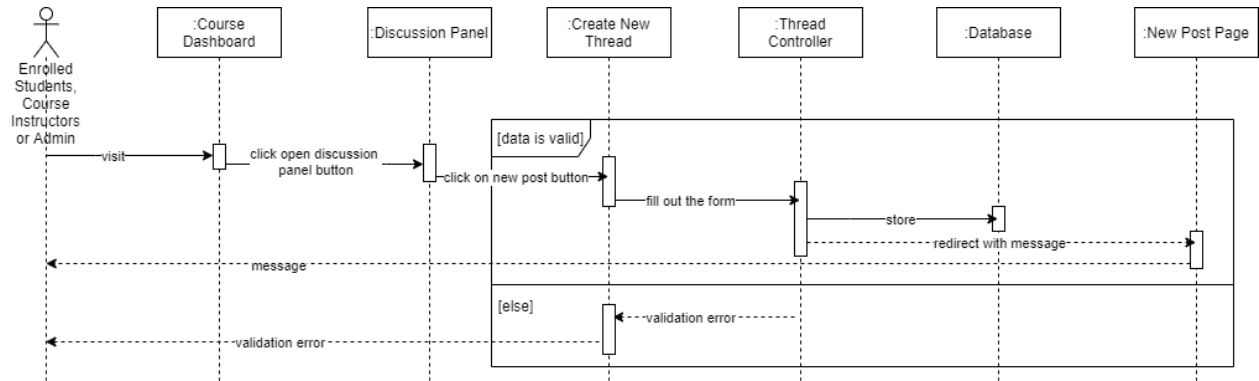


Figure 3.1.19: Sequence Diagram of Create Discussion Thread

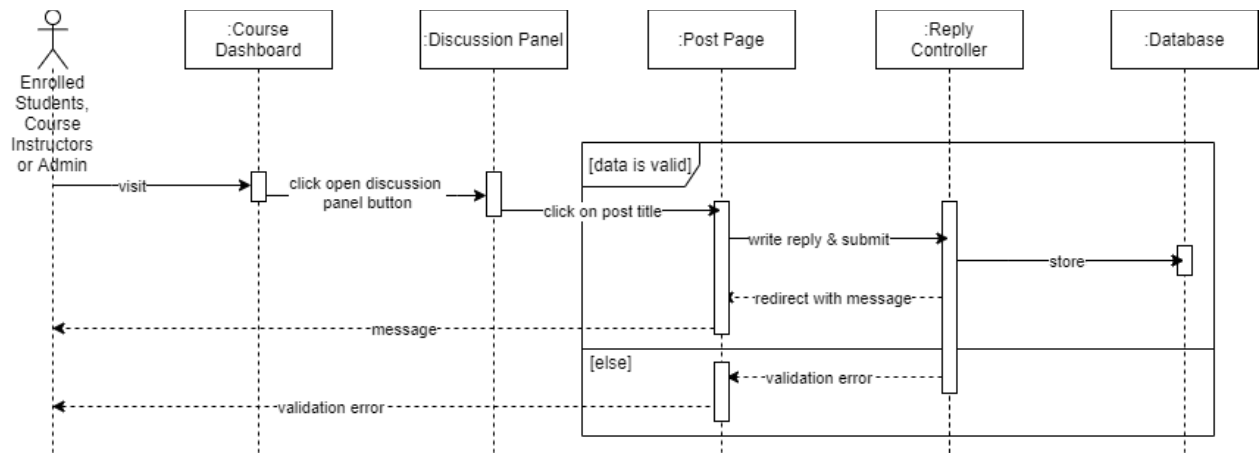


Figure 3.1.20: Sequence Diagram of Reply to Discussion Thread

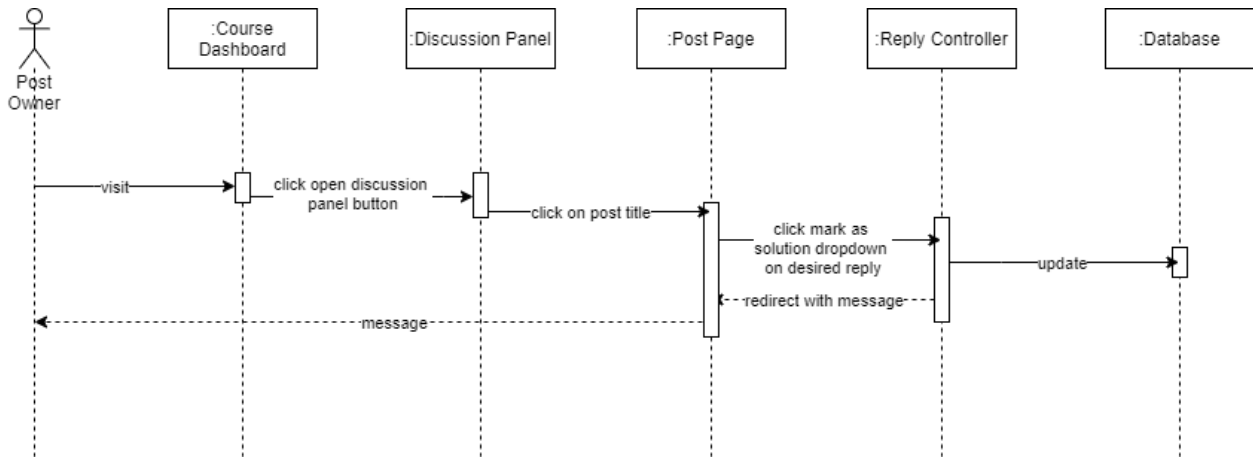


Figure 3.1.21: Sequence Diagram of Mark Reply as Solution

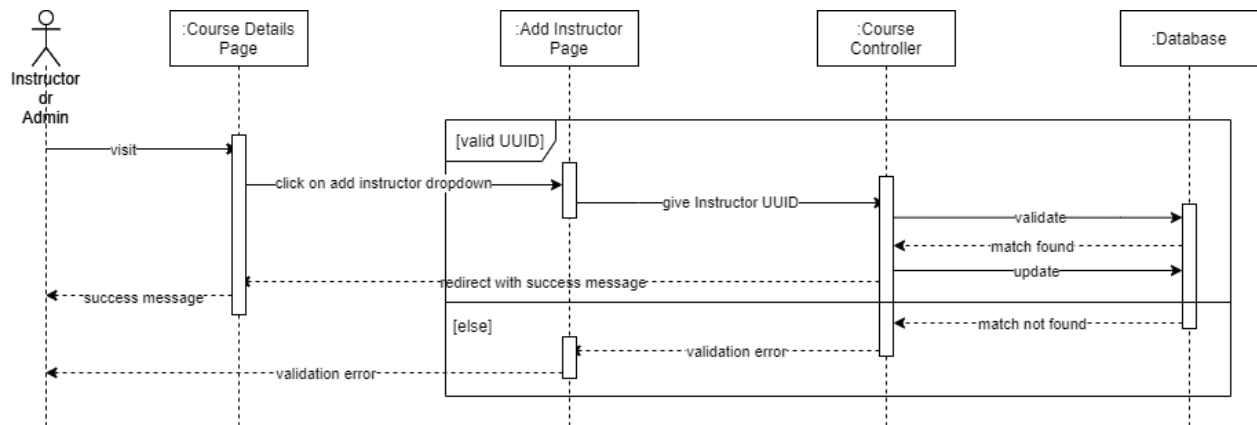


Figure 3.1.22: Sequence Diagram of Add Instructor

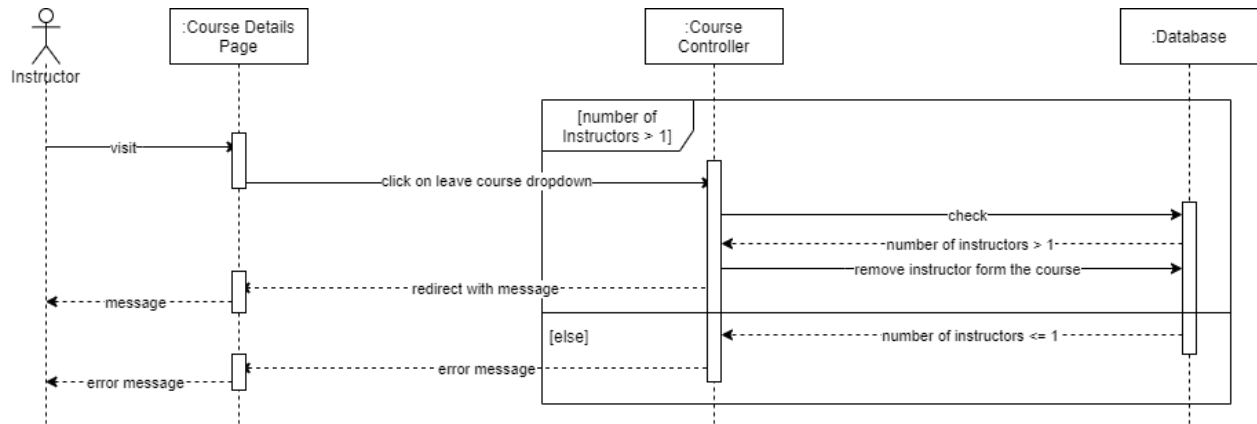


Figure 3.1.23: Sequence Diagram of Leave Course

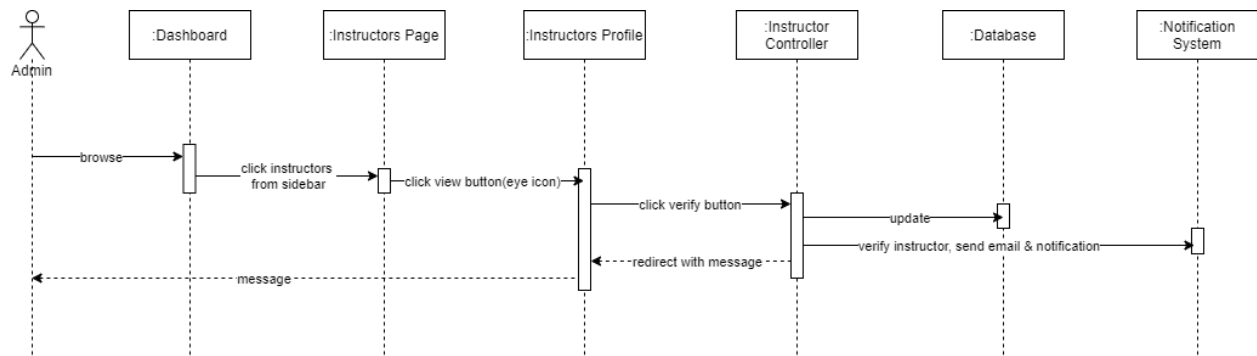


Figure 3.1.24: Sequence Diagram of Verify Instructor

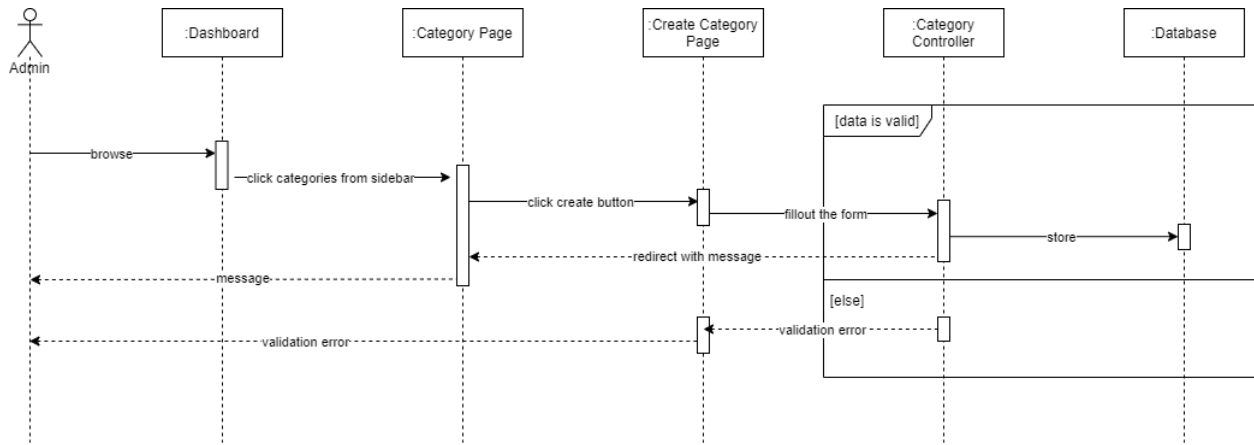


Figure 3.1.25: Sequence Diagram of Create Category

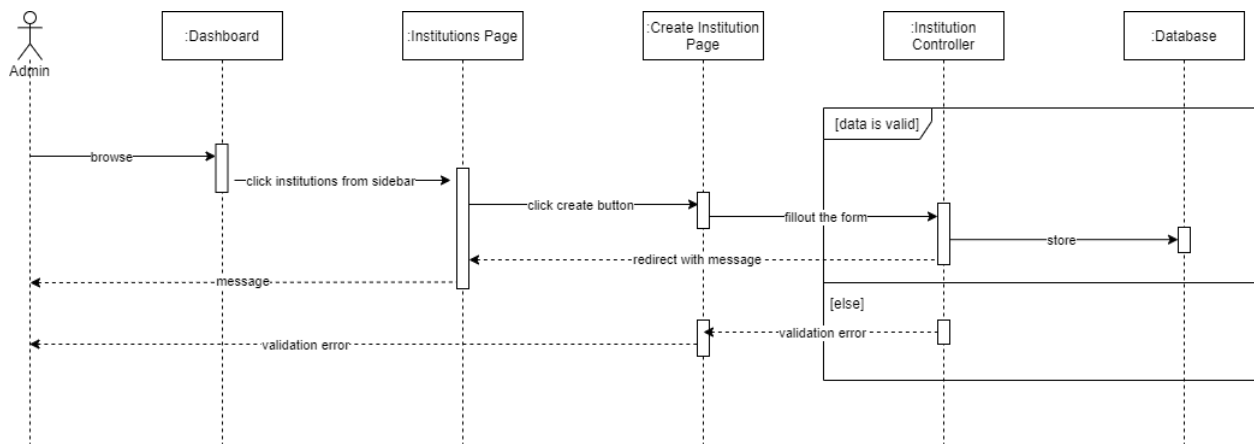


Figure 3.1.26: Sequence Diagram of Create Institution

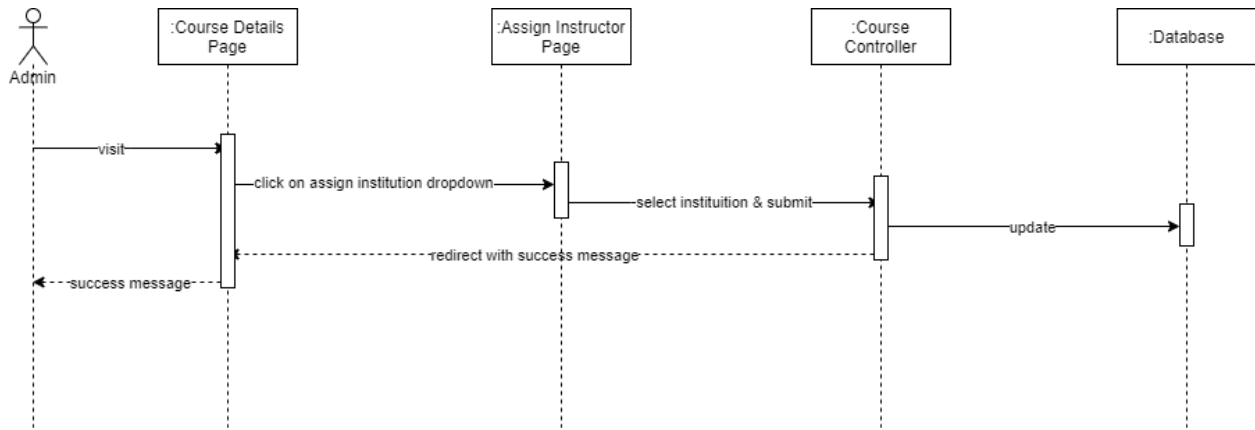


Figure 3.1.27: Sequence Diagram of Assign Course to Institution

### 3.2 Activity Diagrams:

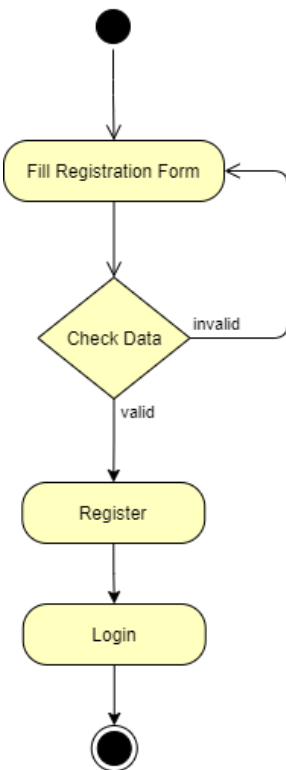


Figure 3.2.1: Activity Diagram for Register

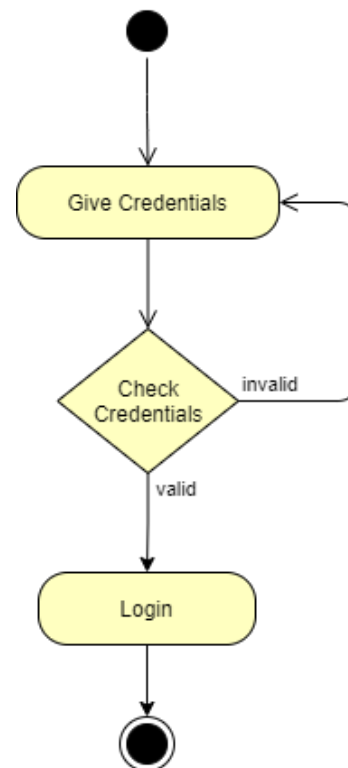


Figure 3.2.2: Activity Diagram for Login

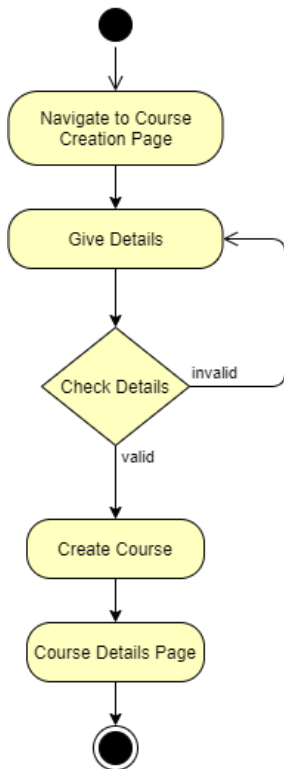


Figure 3.2.3: Activity Diagram for Create Course

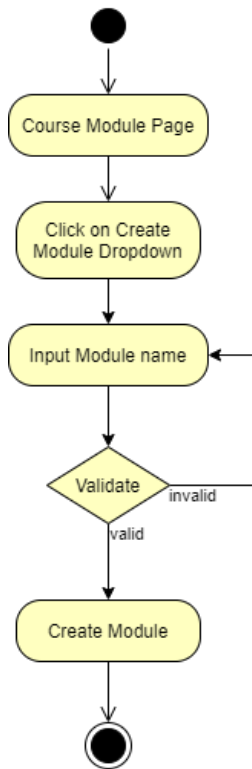


Figure 3.2.4: Activity Diagram for Create Module

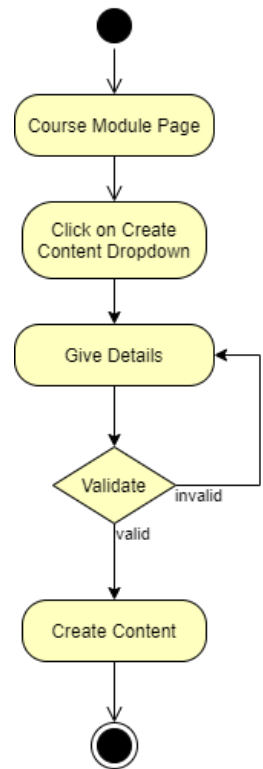


Figure 3.2.5: Activity Diagram for Create Content

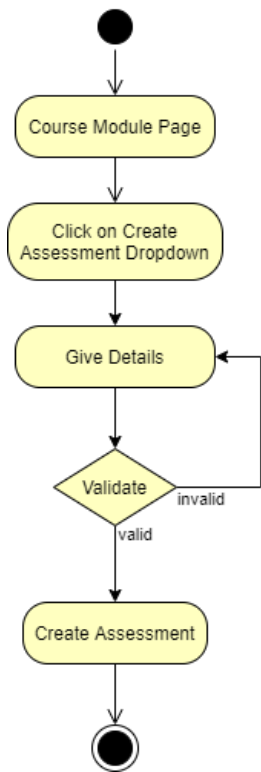


Figure 3.2.6: Activity Diagram for Create Assessment

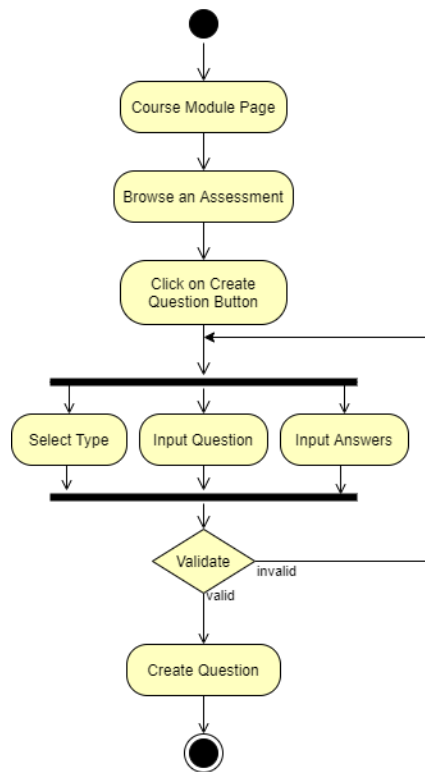


Figure 3.2.7: Activity Diagram for Create Question

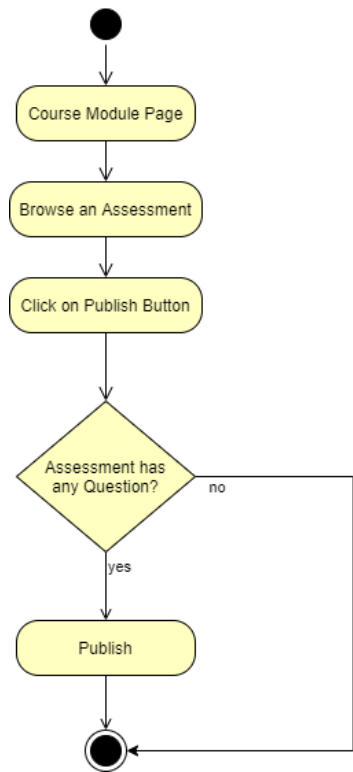


Figure 3.2.8: Activity Diagram for Publish Assessment



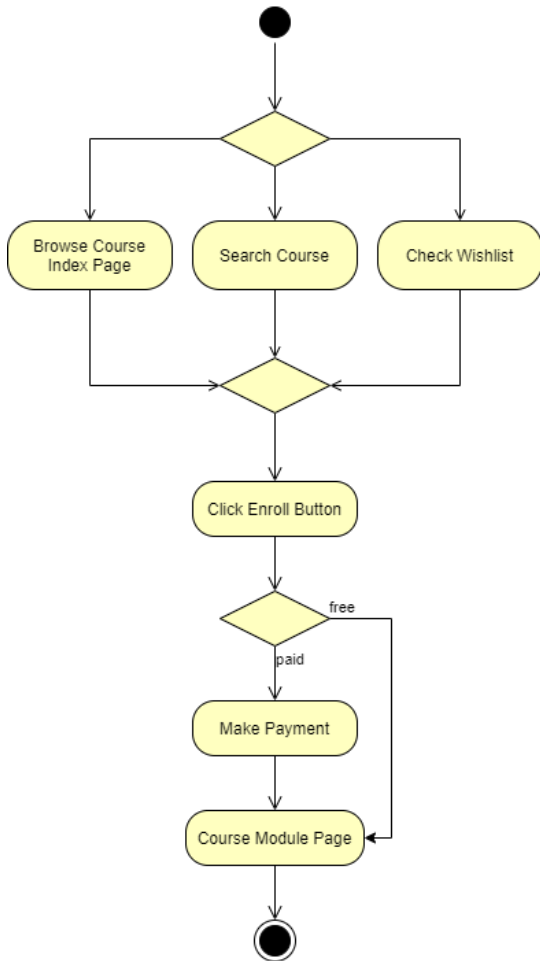


Figure 3.2.9: Activity Diagram for Enroll Course

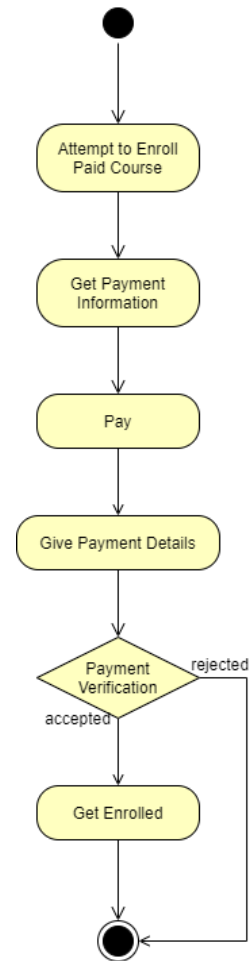


Figure 3.2.10: Activity Diagram for Payment

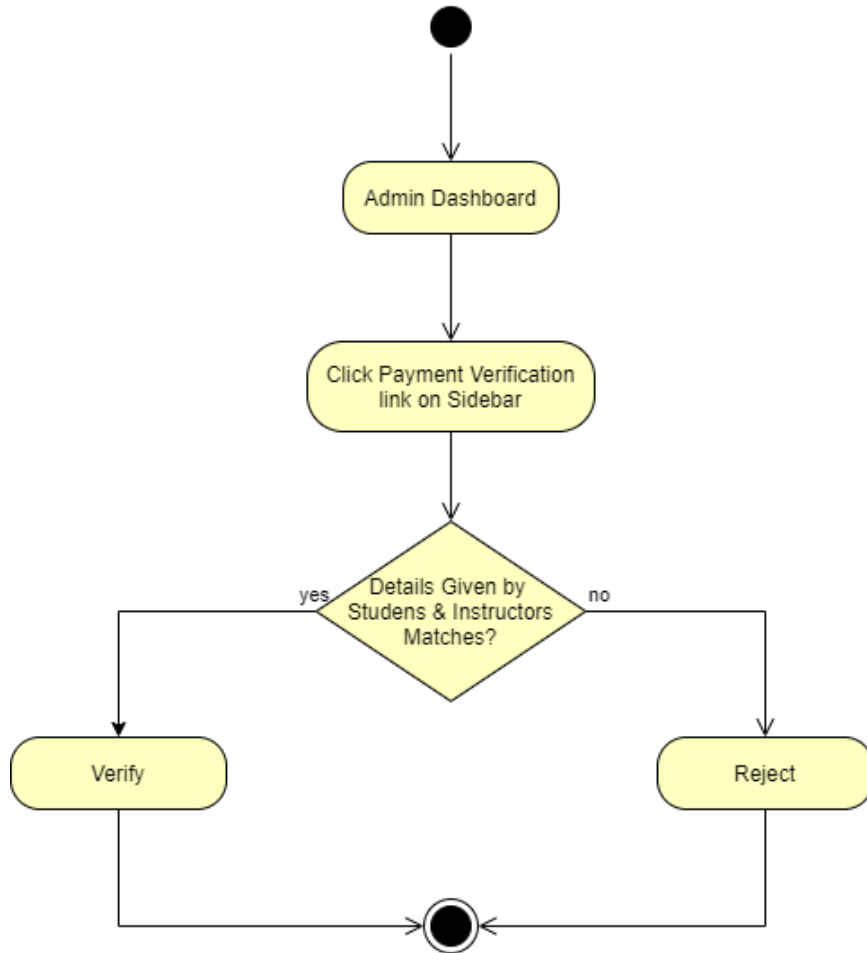


Figure 3.2.11: Activity Diagram for Verify Payment

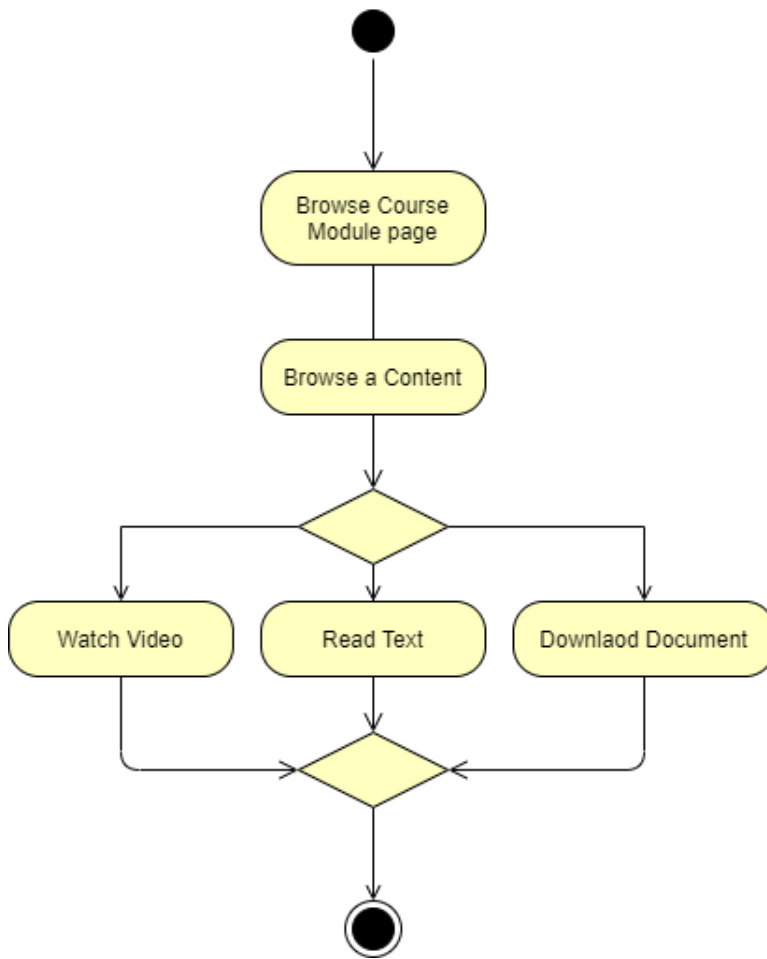


Figure 3.2.12: Activity Diagram for Access Content

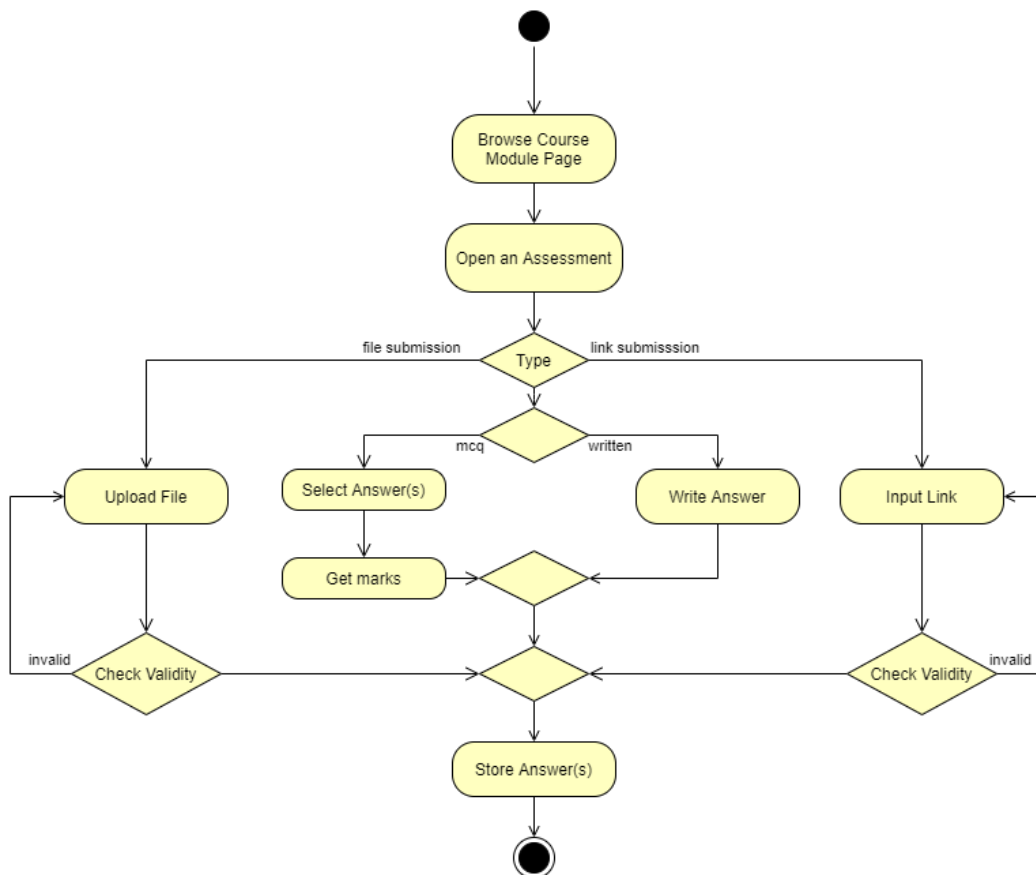


Figure 3.2.13: Activity Diagram for Submit Assessment

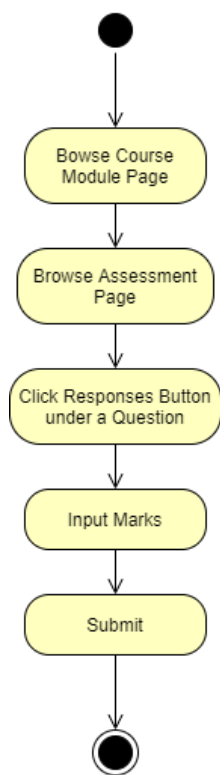


Figure 3.2.14: Activity Diagram for Grade Assessment

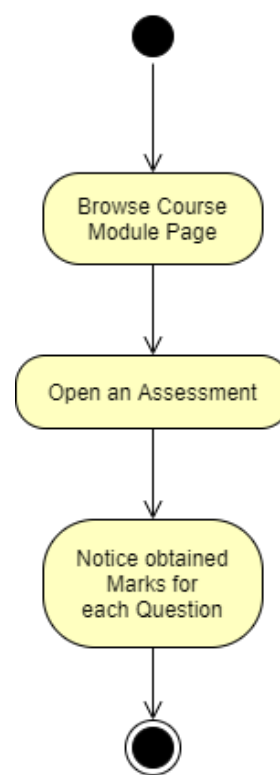


Figure 3.2.15: Activity Diagram for View Obtained Marks

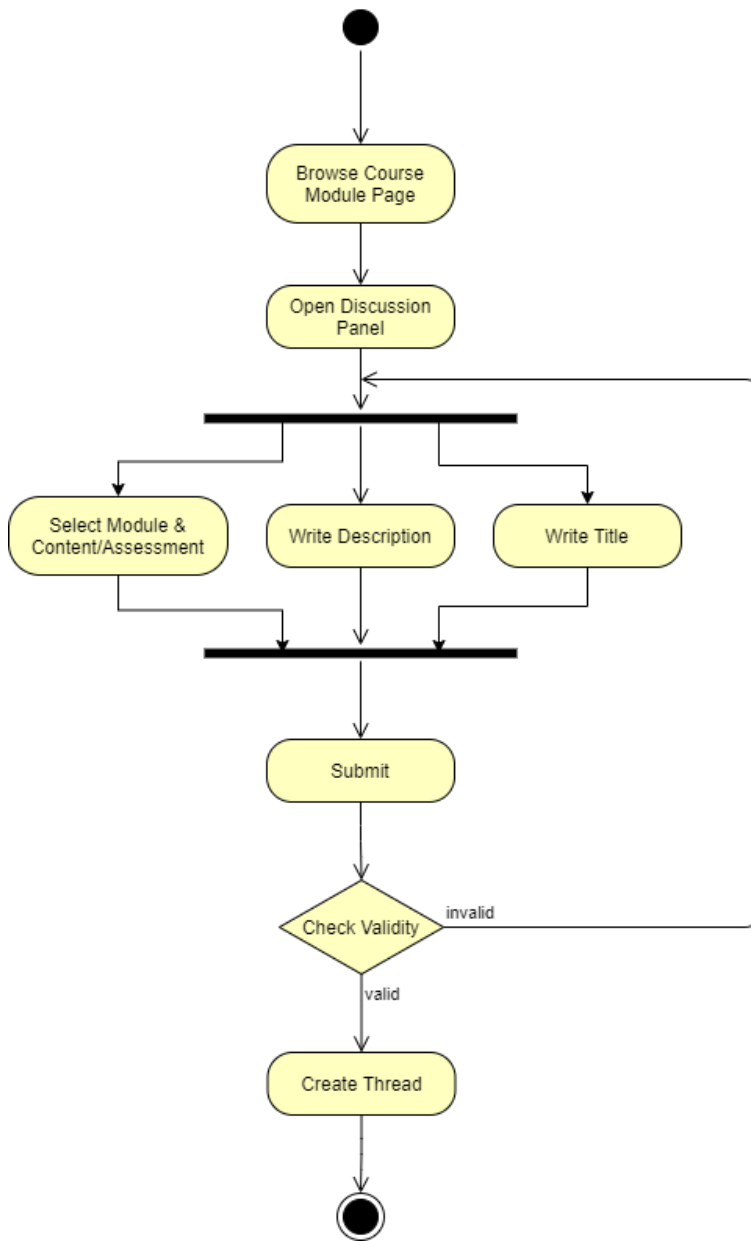


Figure 3.2.16: Activity Diagram for Create Discussion Panel Thread

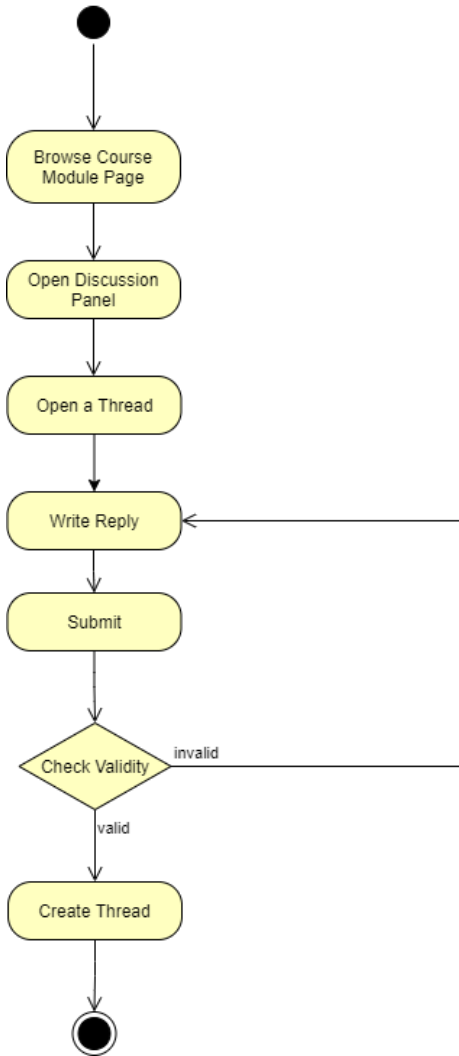


Figure 3.2.17: Activity Diagram for Reply to Discussion Panel Thread

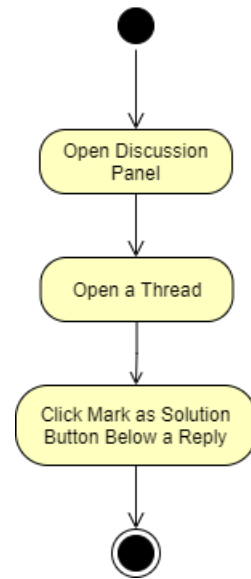


Figure 3.2.18: Activity Diagram for Mark as Solution

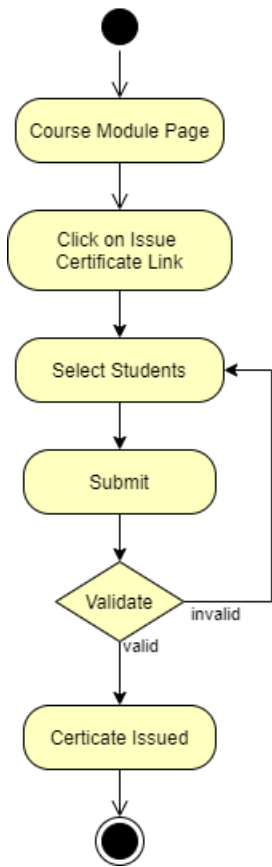


Figure 3.2.19: Activity Diagram for Issue Certificate

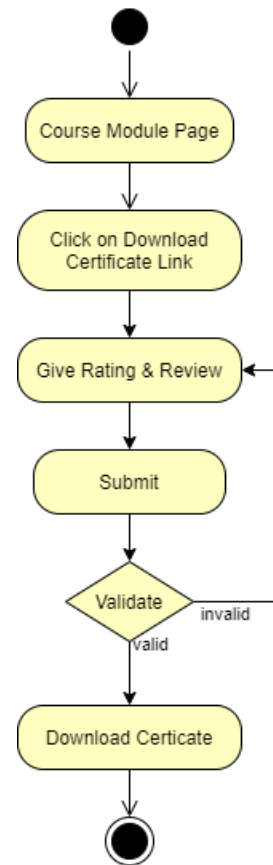


Figure 3.2.20: Activity Diagram for Download Certificate



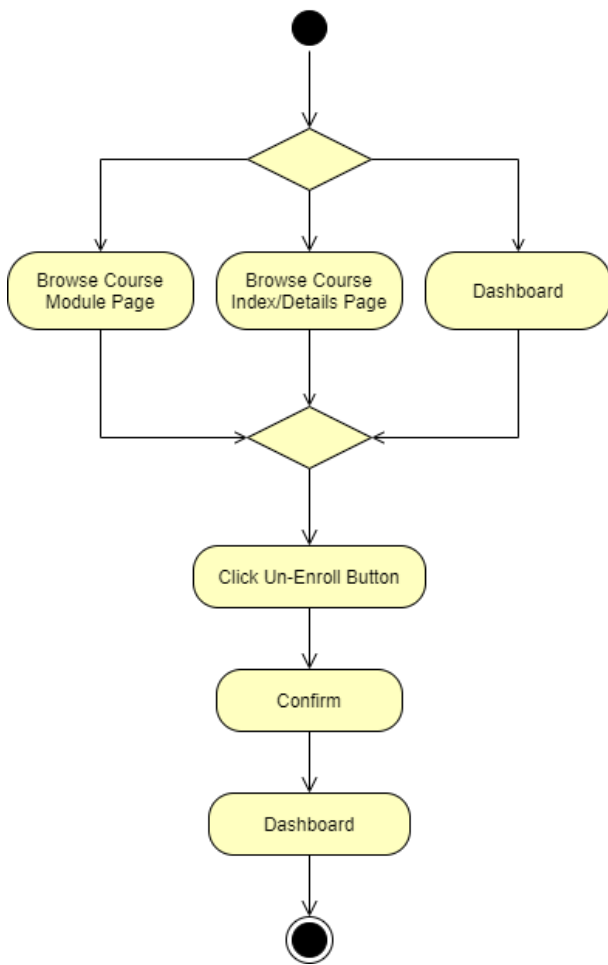


Figure 3.2.21: Activity Diagram for Un-enroll

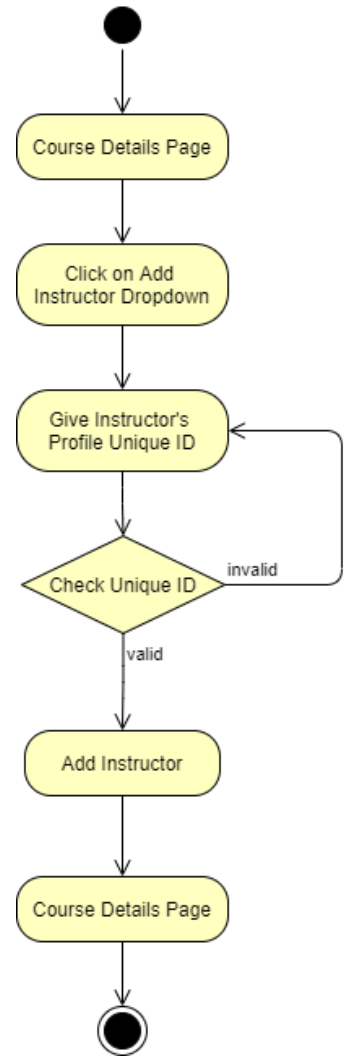


Figure 3.2.22: Activity Diagram for Add Instructor

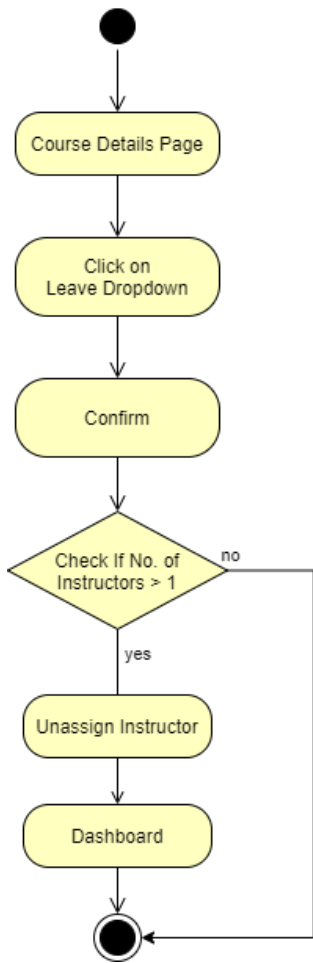


Figure 3.2.23: Activity Diagram for Leave Course

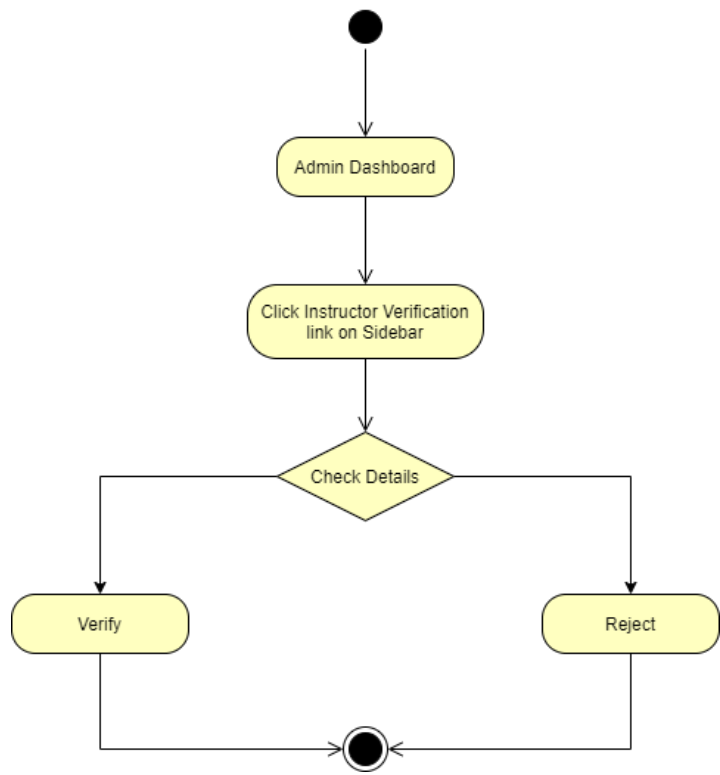


Figure 3.2.24: Activity Diagram for verify Instructor

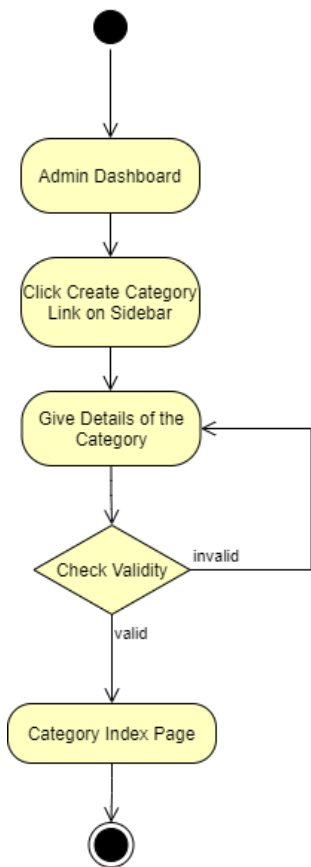


Figure 3.2.25: Activity Diagram for Create Category

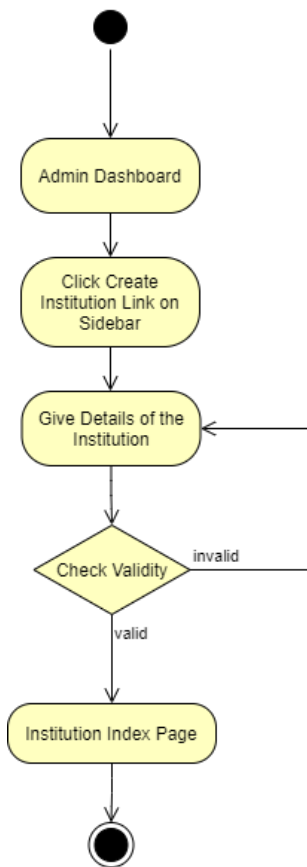


Figure 3.2.26: Activity Diagram for Create Institution

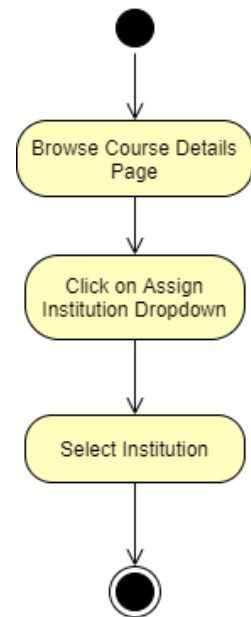


Figure 3.2.27: Activity Diagram for Assign Course to Institution

### 3.3 Data-Flow Diagram

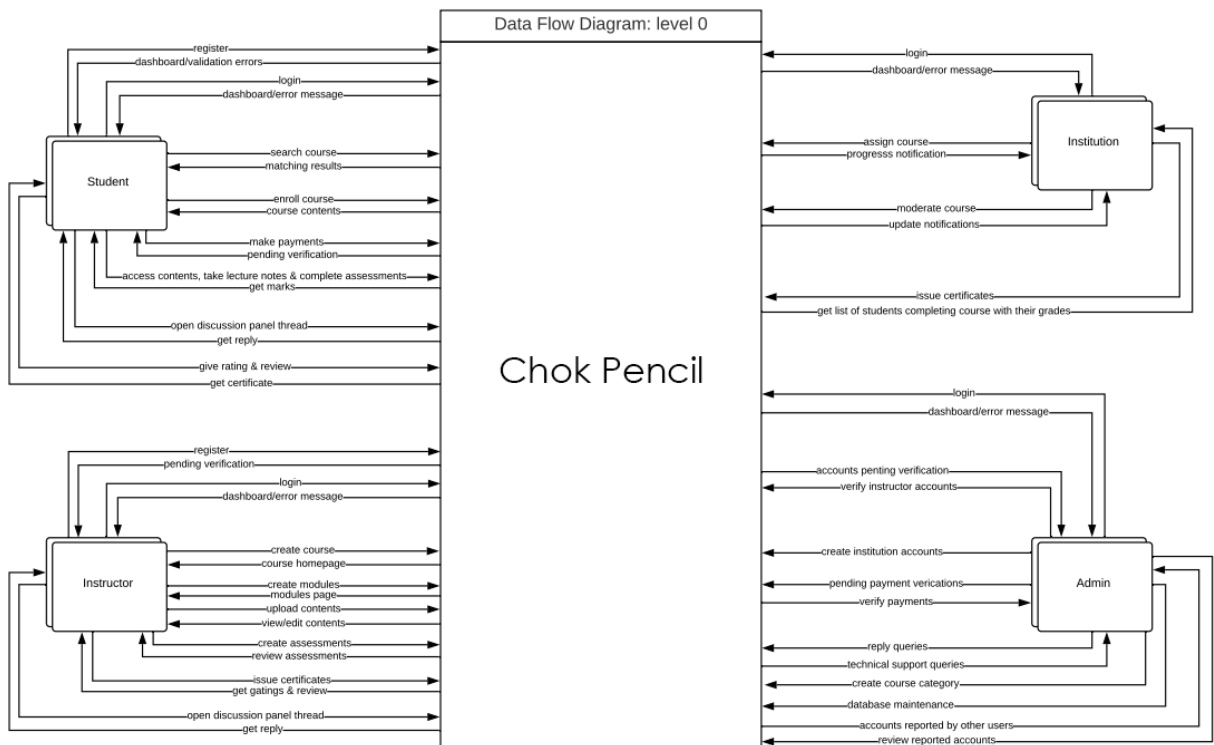


Figure 3.3.1: Data-Flow Diagram

### 3.4 Entity Relationship Diagram

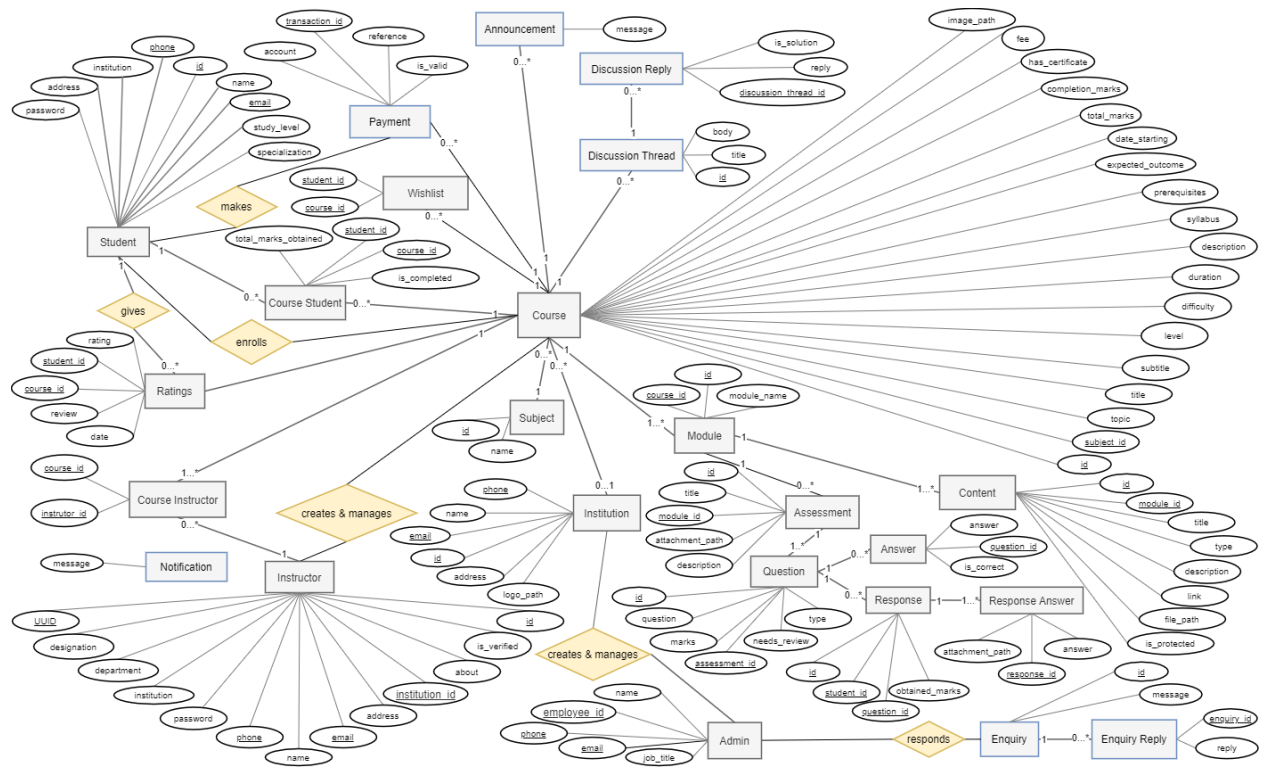


Figure 3.4.1 Entity Relationship Diagram

### 3.5 Class Diagram

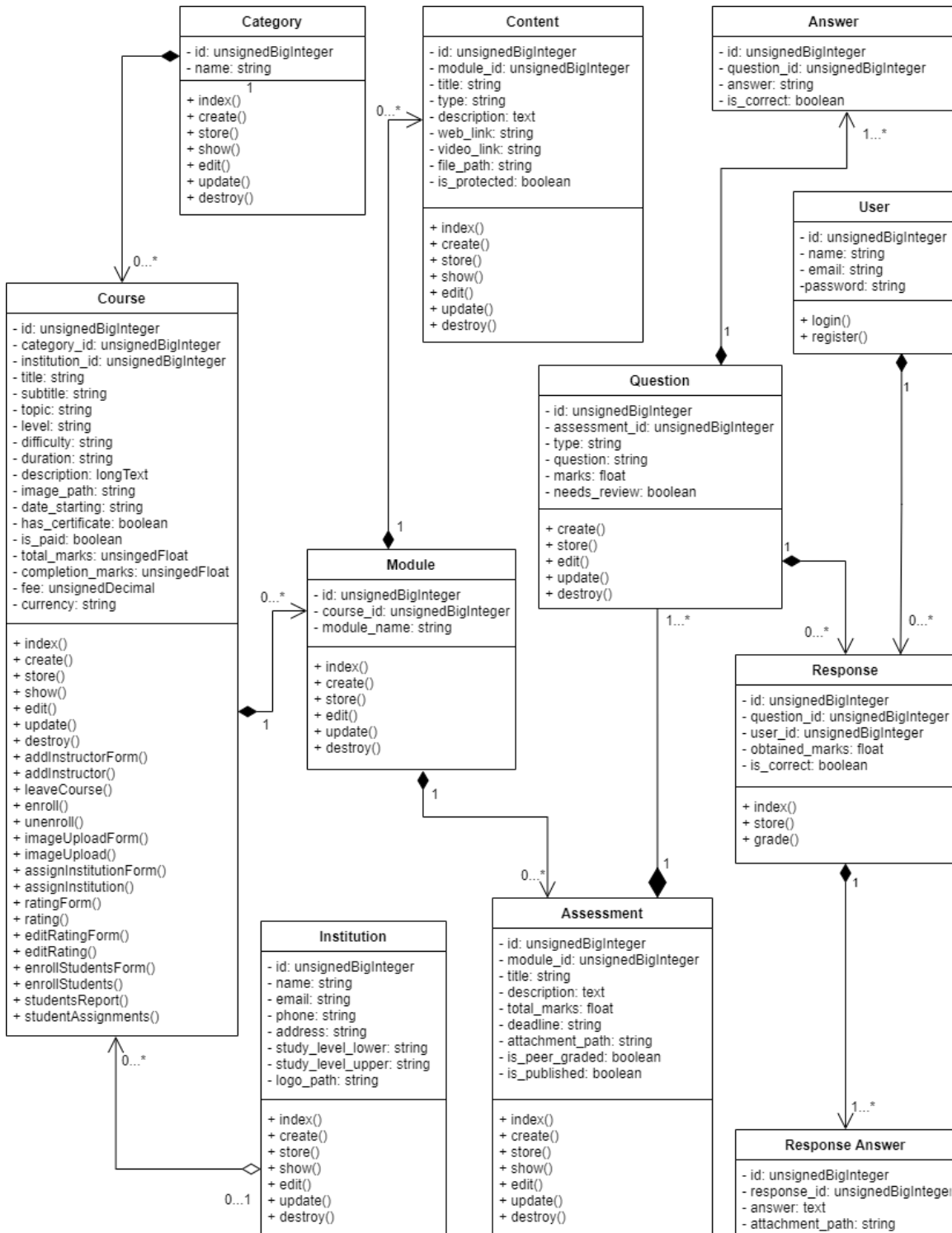


Figure 3.5.1 Class Diagram of Course Management & Assessment Module

# Chapter 4: System Development

This chapter specifies different specifications related to the development of the system. It also describes why the technologies used for development has been chosen and how they are used.

## 4.1 Tools and Technologies:

### 4.1.1 Front-End Development:

- HTML 5
- CSS 3
- Bootstrap 4.5
- jQuery 3.3

### 4.1.2 Back-End Development:

- PHP Laravel 6

### 4.1.3 Database Server:

- MySQL

### 4.1.4 Local Server Solution:

- Laragon

### 4.1.5 Version Controlling:

- Git & GitHub

### 4.1.6 IDE:

- PHP Storm

### 4.1.7 Additional Technologies:

- Vimeo Streaming Hosting
- Sprite Payment Gateway
- Sweet Alert Toast Notification

- Feather Icons

## 4.2 Front-End Development:

For simplicity and time constraint no JavaScript Framework like Vue.js, React or Angular has been used in the development but can be introduced in future. The front-end of the project comprises mostly of Blade Template Engine which comes Laravel Framework which is used to develop the backend of the project. Blade Template Engine gives the HTML (Hyper Text Mark-Up Language) some programming language functionalities like inheritance, conditional statements, loops and also makes some Laravel exclusive helper functions usable in frontend by injecting PHP code with prettier syntax and also gives ability to make components.

To make some pages more interactive and reactive, specially some forms, jQuery is used which is a popular JavaScript library and allows DOM (Document Object Model) manipulation without page reload. It also helps to make AJAX request to the server without page reload for fetching dependent data.

## 4.3 Back-End Development:

The back-end of the project is fully developed using Laravel Framework. Laravel is currently the most popular framework for web application development which is an open-source and free to use framework developed with PHP Programming Language which implement the MVC (Model-View-Controller) pattern.

Laravel is fully object-oriented framework which uses service container and service providers to offer pre-build features or services exclusively designed for web application development. Service container is a powerful tool for class dependency management or in other words it contains all class dependencies of the application and automatically resolves it. Laravel is itself composed of Service Providers and as the name suggests a Service Provider a special service like Authentication, Authorization, Filesystem etc. Laravel provides security, maintainability and scalability.

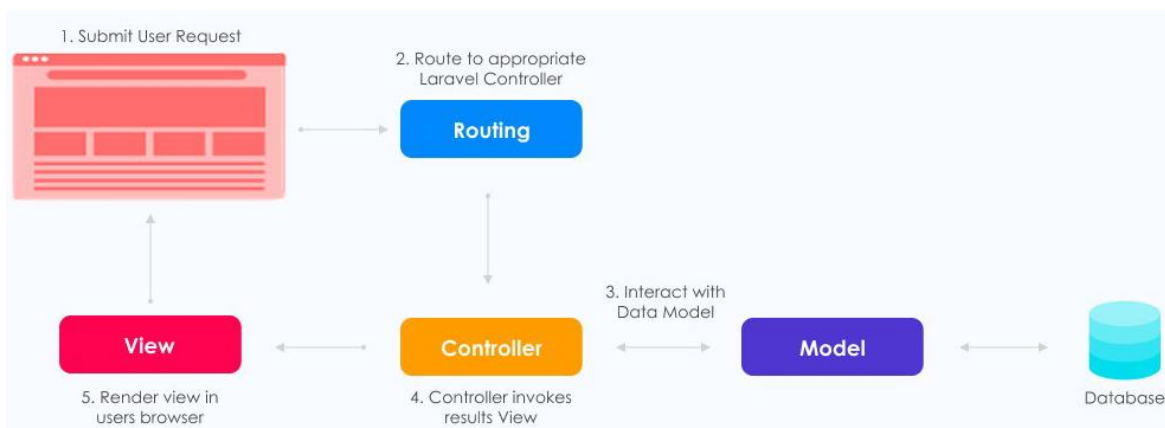


Figure 4.3.1: Laravel Architecture



## 4.4 Database Programming:

MySQL Server is used for database management in the project. MySQL is an open-source relational database management system. Additionally, Laravel uses ORM (Object Relational Model) to query database like most other modern frameworks called Eloquent. Database table design is implemented and migrated to SQL server by Migration files which offers tracking and rollback facilities. Database tables can be seeded with default data like first Admin account using Seeder classes. Eloquent Models represent the database table into object-oriented form where the table attributes are properties of the class object. Query Builder SQL makes queries very simple by providing prebuilt functions for common query statements. The relationship between multiple tables can be declared as functions in Model classes and related Model properties can be accessed directly from another Model's object.

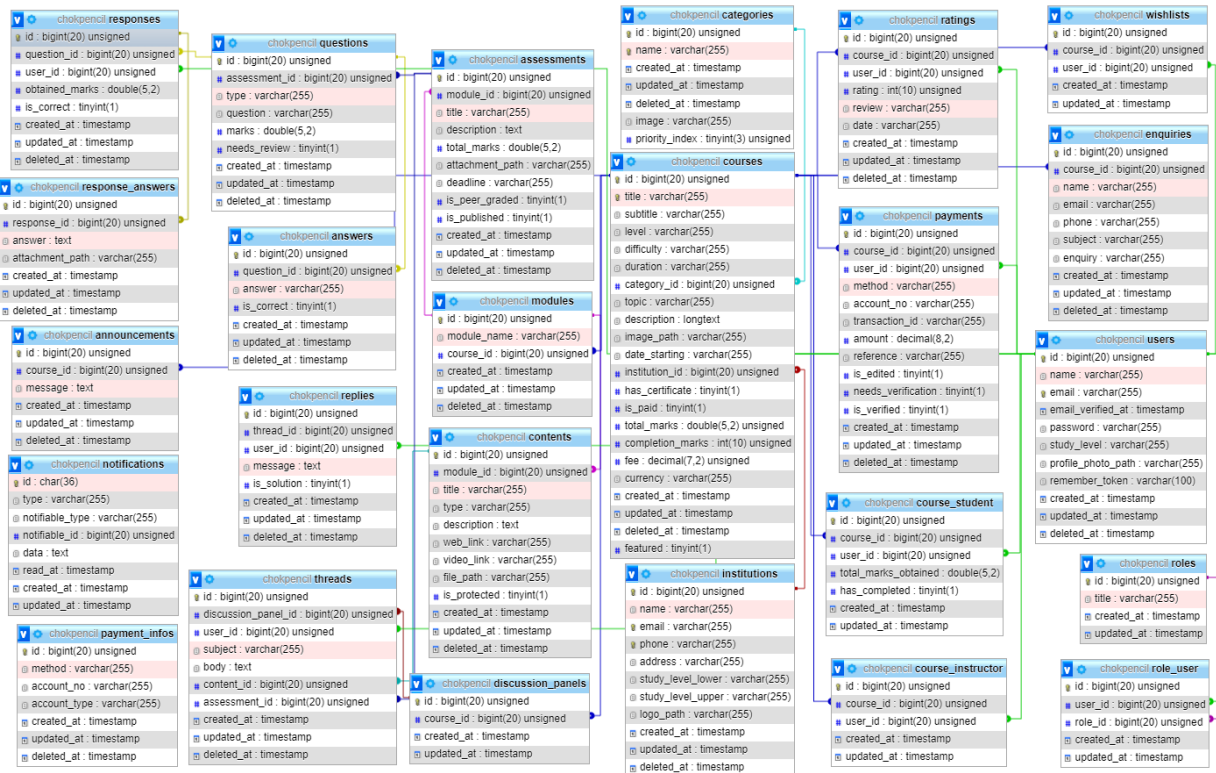


Figure 4.4.1: Database Schema Diagram

# Chapter 5: System Testing

Testing is essential to ensure the reliability, usability, scalability etc. attribute of the system and overall quality of the system. The features of the project are tested using different methods to deliver a fully functional and reliable software. In this chapter, testing approach and test cases of the system will be described.

## 5.1 Testing Approach:

The system is tested by building test cases. All the test cases have been tested manually with different sets of data to arise different scenario. Due to time constraint and very limited human resource and skill automation testing is not done but can be easily completed in future with the same test cases.

Black box testing method is mainly shown by observing the outputs of the system with given inputs. Although white box testing is also done during coding phase, only black box testing results are listed here to keep it short.

## 5.2 Pass/Fail Criteria:

To determine whether the system is acting properly for a given set of data some pass/fail criteria must be set. The following criteria have been followed throughout the whole testing phase:

- System crash is considered as a failure case
- If the system fails to display expected data, then it is also considered as a failure case
- Only if the expected outcome and actual outcome matches fully then it is accepted as a pass case

## 5.3 Test Cases:

Test Case #01					Test Case Name: Registration			
Short Description: Students and Instructors will be able to register to the system								
Pre-condition: User must have a valid email address								
#	Name	Email	Study Level	Password	Confirm Password	Expected Outcome	Actual Outcome	Remark
1						Validation errors for all required fields	Validation errors displayed	Pass
2	Kamrul Haque	utchas903	Undergraduate	utchas	utchas	Please Enter Valid Email	Please Enter Valid Email	Pass

						Password must be at least 8 characters	Password must be at least 8 characters	
3	Kamrul Haque	utchas903	Undergraduate	utchas12345	utchas1234	Password doesn't match	Password doesn't match	Pass
4	Kamrul Haque	utchas903	Undergraduate	utchas12345	utchas12345	Registration Successful	Registration Successful	Pass

<b>Test Case #02</b>						<b>Test Case Name: Login</b>		
<b>Short Description:</b> Users will be able to login								
<b>Pre-conditions:</b> User must have an account								
#	Email	Password	Expected Outcome			Actual Outcome		Remark
1			Validation errors for all required fields			Validation errors displayed		Pass
2	utchas03@gmail.com	utchas12345	These credentials do not match our records			These credentials do not match our records		Pass
3	utchas03@gmail.com	utchas1234	These credentials do not match our records			These credentials do not match our records		Pass
4	utchas03@gmail.com	utchas12345	Login Successful			Login Successful		Pass

<b>Test Case #03</b>							<b>Test Case Name: Create Course</b>				
<b>Short Description:</b> A new course will be created											
<b>Pre-conditions:</b> User must be logged in and instructor must be verified											
#	Title	Subtitle	Level	Difficulty	Duration	Category	Topic	Description	Expected Outcome	Actual Outcome	Remark
1									Validation errors for all required fields	Validation errors displayed	Pass
2	Space Wrap with Unity	Learn to make exciting games in most popular game engine Unity without any prior knowledge on game development.	Undergraduate	Beginner	3 Weeks	COMPUTER SCIENCE	Game Development	Overview Learn to make 2D games with Unity developing a real indie game.  Description This course is intended for beginners	Course Created Successfully	Course Created Successfully	Pass

							<p>interested in game development with no prior knowledge. Through the course student will learn about basics of not only Unity programming but also other components of Unity. Prior knowledge of object oriented programming will be helpful but not required. At the end of the course, a real fully functional 2D game will be built. Although this course will not cover building graphics assets for the game.</p> <p>Module Structure</p> <p>Introduction Unity Setup with Visual</p>			
--	--	--	--	--	--	--	--	--	--	--

								Studio as default code editor Scenes, Assets, Scripts, Sprites, Prefabs Basic Script Rigid Bodies & Colliders Timers, Awake & Start Update & Fixed Update Classes & Objects Spawning & Destroyin g Forces, Angles and Direction Building the Game Requirem ents  Knowledg e of:  Basic Maths Basic Physics Basic Programm ing Object Oriented Programm ing Concept			
--	--	--	--	--	--	--	--	---	--	--	--

<b>Test Case #04</b>	<b>Test Case Name:</b> Create Module
<b>Short Description:</b> A new course module will be created	
<b>Pre-conditions:</b> Course must exist and instructor must own the course	

#	Module Name	Expected Outcome	Actual Outcome	Remark
1		Validation errors for all required fields	Validation errors displayed	Pass
2	Introduction	Module Created Successfully	Module Created Successfully	Pass

Test Case #05					Test Case Name: Create Content			
Short Description: A new content will be created								
Pre-conditions: Course must exist and instructor must own the course								
#	Title	Type	Description	Link	File	Expected Outcome	Actual Outcome	Remark
1						Validation errors for all required fields	Validation errors displayed	Pass
2	Welocome!	Video		<a href="https://www.youtube.com/watch?v=pwZpJzpE2lQ&amp;t=181s">https://www.youtube.com/watch?v=pwZpJzpE2lQ&amp;t=181s</a>		Content created and Youtube player displayed in a new page	Content created and Youtube player displayed in a new page	Pass
3	Scenes	Text	<p>Opening Scenes To open a Scene in Unity, double-click the Scene Asset in the Project window. You must open a Scene in Unity to work on it.</p> <p>If your current Scene contains unsaved changes, Unity asks you whether you want to save or discard the changes.</p>			Content created and text displayed with proper formatting in a new page	Content created and text displayed with proper formatting in a new page	Pass
4	Written Guide	File			A PDF File Uploaded	Content created and download link with proper formatting in a new page	Content created and download link with proper formatting in a new page	Pass

Test Case #06					Test Case Name: Create Assessment		
Short Description: A new assessment will be created							
Pre-conditions: Course must exist and instructor must own the course							
#	Title	Description	Deadline	Attachment File	Expected Outcome	Actual Outcome	Remark

1					Validation errors for all required fields	Validation errors displayed	Pass
2	Quiz 1		25-12-2020		Deadline must be after today	Deadline must be after today	Pass
3	Quiz 1	Answer all the questions and upload your code for Question 5. There are some instructions for building your first WebGL project in the attached document.	05-01-2022		Assessment created and displayed in a new page	Assessment created and displayed in a new page	Pass
4	Quiz 2		07-01-2022	A PDF File Uploaded	Assessment created and displayed in a new page	Assessment created and displayed in a new page	Pass
5	Quiz 3		10-01-2022		Assessment created and displayed in a new page	Assessment created and displayed in a new page	Pass

<b>Test Case #07</b>					<b>Test Case Name:</b> Create Question		
<b>Short Description:</b> A new question will be created							
<b>Pre-conditions:</b> An assessment and course must exist and instructor must own the course							
#	Question	Type	Marks	Options	Expected Outcome	Actual Outcome	Remark
1					Validation errors for all required fields	Validation errors displayed	Pass
2	Prefabs are?	MCQ	2.5		Options is required if type is MCQ	Options is required if type is MCQ	Pass
3	Prefabs are?	MCQ	2.5	<ul style="list-style-type: none"> <li>• Game Objects (is correct)</li> <li>• Unity Component (is correct)</li> <li>• C# Function</li> </ul>	Question created and displayed in assessment page	Question created and displayed in assessment page	Pass
4	Describe Unity Component	Descriptive	10		Question created and displayed in assessment page	Question created and displayed in assessment page	Pass

<b>Test Case #08</b>					<b>Test Case Name:</b> Publish Assessment		
<b>Short Description:</b> Assessment will be published and visible to students enrolled into the course							
<b>Pre-conditions:</b> The assessment must have at least one question							
#	Questions Count	Action	Expected Outcome		Actual Outcome		Remark

1	0	Click publish button on assessment page	At least one question must exist	At least one question must exist	Pass
2	5	Click publish button on assessment page	Assessment published successfully	Assessment published successfully	Pass

<b>Test Case #09</b>			<b>Test Case Name: Search Course</b>		
<b>Short Description:</b> Users can search courses					
<b>Pre-conditions:</b> The student must be logged in					
#	Search String	Action	Expected Outcome	Actual Outcome	Remark
1		Press enter or click search button	All courses are shown	All courses are shown	Pass
2	Random	Press enter or click search button	No dropdown shown while typing and after pressing enter no results found	No dropdown shown while typing and after pressing enter no results found	Pass
3	Unity	Press enter or click search button	Dropdown shown with the matched courses and after pressing enter matched courses displayed	Dropdown shown with the matched courses and after pressing enter matched courses displayed	Pass

<b>Test Case #10</b>			<b>Test Case Name: Wishlist Course</b>		
<b>Short Description:</b> Student can wishlist courses					
<b>Pre-conditions:</b> The student must be logged in					
#	Action	Expected Outcome	Actual Outcome	Remark	
1	Click wishlist button on desired course card or course details page	Course is wishlisted	Course is wishlisted	Pass	

<b>Test Case #11</b>			<b>Test Case Name: Enroll Course</b>		
<b>Short Description:</b> Student can enroll courses					
<b>Pre-conditions:</b> The student must be logged in					
#	Course Type	Action	Expected Outcome	Actual Outcome	Remark
1	Free	Click enroll button on desired course card or course details page	Enrolled successfully and redirect to course dashboard	Enrolled successfully and redirect to course dashboard	Pass
2	Paid	Click enroll button on desired course card or course details page	Redirect to payment page	Redirect to payment page	Pass

<b>Test Case #12</b>			<b>Test Case Name: Payment(International Cards)</b>			
<b>Short Description:</b> Student can pay course fee for paid courses						
<b>Pre-conditions:</b> The student must be logged in						
#	Name on Card	Card Information	Reference	Expected Outcome	Actual Outcome	Remark
1				Validation errors for all required fields	Validation errors displayed	Pass
2	Abdul Quyum	Card No: 4000 0000 0000 0002 Expiry Date: 01/24 CVV: 123	Kamrul Haque	Card Error	Card Error	Pass
3	Abdul Quyum	Card No:4242 4242 4242 4242	Kamrul Haque	Enrolled successfully and redirect to course dashboard	Enrolled successfully and redirect to course dashboard	Pass



	Expiry Date: 01/24 CVV: 123			
--	--------------------------------	--	--	--

<b>Test Case #13</b>				<b>Test Case Name: Payment(Mobile Banking)</b>			
<b>Short Description:</b> Student can pay course fee for paid courses							
<b>Pre-conditions:</b> The student must be logged in							
#	Payment Method	Account No.	Transaction ID	Reference	Expected Outcome	Actual Outcome	Remark
1					Validation errors for all required fields	Validation errors displayed	Pass
2	BKash	(+880) 1998330487	TRX85367	Kamrul Haque	Email sent and notification displayed for payment received	Email sent and notification displayed for payment received	Pass
3	Rocket	(+880) 1998330487	TRX0246	Kamrul Haque	Email sent and notification displayed for payment received	Email sent and notification displayed for payment received	Pass
4	Nagad	(+880) 1998330487	TRX4554	Kamrul Haque	Email sent and notification displayed for payment received	Email sent and notification displayed for payment received	Pass

<b>Test Case #14</b>				<b>Test Case Name: Verify Payment</b>			
<b>Short Description:</b> Admins can verify payments							
<b>Pre-conditions:</b> Admin must be logged in							
#	Payment Status	Action	Expected Outcome	Actual Outcome	Remark		
1	Pending Verification	Click verify button on payments page	Payment is verified, student will be enrolled, notification and email with the course dashboard link	Payment is verified, student will be enrolled, notification and email with the course dashboard link	Pass		

<b>Test Case #15</b>				<b>Test Case Name: Access Course Materials</b>			
<b>Short Description:</b> Students can access all course materials							
<b>Pre-conditions:</b> Student must be enrolled into the course and must be logged in							
#	Action	Expected Outcome	Actual Outcome	Remark			
1	Visit course dashboard link	Course dashboard page opens and all course materials are displayed	Course dashboard page opens and all course materials are displayed	Pass			

<b>Test Case #16</b>				<b>Test Case Name: Submit Assessment</b>			
<b>Short Description:</b> Students can submit assessment question-wise							
<b>Pre-conditions:</b> Student must be enrolled into the course and must be logged in							
#	Answer	Expected Outcome	Actual Outcome	Remark			

1	Select Game Objects Option	Answer will be automatically graded and obtained marks will be displayed	Answer will be automatically graded and obtained marks will be displayed	Pass
2	Called every frame	Answer stored and pending review will be displayed	Answer stored and pending review will be displayed	Pass
3	Upload File	Answer stored and pending review will be displayed	Answer stored and pending review will be displayed	Pass
4	Link pasted	Answer stored and pending review will be displayed	Answer stored and pending review will be displayed	Pass

<b>Test Case #17</b>		<b>Test Case Name: Grade Assessment</b>		
<b>Short Description:</b> Instructors can grade assessment submitted by students				
<b>Pre-conditions:</b> Instructor must own the course and must be logged in				
#	Mark	Expected Outcome	Actual Outcome	Remark
1	10 (Out of 5)	Obtained mark cannot be greater than total mark	Obtained mark cannot be greater than total mark	Pass
2	4 (Out of 5)	Answer will be graded and mark displayed to the student	Answer will be graded and mark displayed to the student	Pass

<b>Test Case #18</b>		<b>Test Case Name: Create Discussion Thread</b>				
<b>Short Description:</b> Users can post new thread on course discussion panel						
<b>Pre-conditions:</b> Student must be enrolled into the course and instructor must own the course and must be logged in						
#	Subject	Message	Content	Expected Outcome	Actual Outcome	Remark
1				Validation errors for all required fields	Validation errors displayed	Pass
2	Welcome	Welcome to the course. Together we hope we will learn a lot.		Thread is posted and full thread page is displayed	Thread is posted and full thread page is displayed	Pass
3	Unity Setup Problem	Don't Install the latest version of unity. There is a bug due to which the installation process fails. Install the version 20.10.1.2 or any other stable version. Thank you.	Unity Environment Setup	Thread is posted and full thread page is displayed	Thread is posted and full thread page is displayed	Pass

<b>Test Case #19</b>		<b>Test Case Name: Reply to Discussion Thread</b>			
<b>Short Description:</b> Users can reply to thread on course discussion panel					
<b>Pre-conditions:</b> Student must be enrolled into the course and instructor must own the course and must be logged in					
#	Message	Expected Outcome	Actual Outcome	Remark	
1		Validation errors for all required fields	Validation errors displayed	Pass	
2	Thanks. Much Appreciated	Reply is posted and visible	Reply is posted and visible	Pass	

<b>Test Case #20</b>		<b>Test Case Name: Mark Reply as Solution</b>			
<b>Short Description:</b> Users can mark a reply as solution					

<b>Pre-conditions:</b> User must own the original thread				
#	Action	Expected Outcome	Actual Outcome	Remark
1	Click "mark as solution" dropdown link on the desired reply	The reply and thread are marked as "solved"	The reply and thread are marked as "solved"	Pass

<b>Test Case #21</b>					<b>Test Case Name: Rate/Review Course</b>					
<b>Short Description:</b> Student can rate/review course										
<b>Pre-conditions:</b> Student must be enrolled into the course and must be logged in										
#	Rating	Review	Expected Outcome	Actual Outcome	Remark					
1			Validation errors for all required fields	Validation errors displayed	Pass					
2	10	Best course for unity beginners.	Course rated and reviewed successfully	Course rated and reviewed successfully	Pass					
3	7.5		Course rated successfully	Course rated successfully	Pass					

<b>Test Case #22</b>					<b>Test Case Name: Download Certificate</b>					
<b>Short Description:</b> Student can download certificate										
<b>Pre-conditions:</b> Student must complete the course with required marks and must be logged in										
#	Action	Expected Outcome	Actual Outcome	Remark						
1	Click download link from course dashboard	Certificate is downloaded as PDF file	Certificate is downloaded as PDF file	Pass						

<b>Test Case #23</b>					<b>Test Case Name: Verify Instructor</b>					
<b>Short Description:</b> Admins can verify new instructors										
<b>Pre-conditions:</b> Admin must be logged in										
#	Account Status	Action	Expected Outcome	Actual Outcome	Remark					
1	Pending Verification	Click verify button on instructor's profile page	Instructor is verified, instructor will be enrolled, notification and email with the course dashboard link	Instructor is verified, instructor will be enrolled, notification and email with the course dashboard link	Pass					

<b>Test Case #24</b>					<b>Test Case Name: Create Category</b>					
<b>Short Description:</b> Admins can create new course categories										
<b>Pre-conditions:</b> Admin must be logged in										
#	Category Name	Expected Outcome	Actual Outcome	Remark						
1		Name is required	Name is required	Pass						
2	Physics	Name is already taken	Name is already taken	Pass						
3	Computer Science	Category created successfully	Category created successfully	Pass						

<b>Test Case #25</b>					<b>Test Case Name: Create Institution</b>					
<b>Short Description:</b> Admins can create new institutions										
<b>Pre-conditions:</b> Admin must be logged in										
#	Name	Email	Phone	Address	Study Level From	Study Level To	Logo	Expected Outcome	Actual Outcome	Remark

1								Validation errors for all required fields	Validation errors displayed	Pass
2	Daffodil International University	contact@diu.edu.bd	1234567890	Savar, Dhaka, Bangladesh	Diploma	Post-Graduate	Image file uploaded	Institution created successfully	Institution created successfully	Pass

<b>Test Case #26</b>				<b>Test Case Name:</b> Assign Course to Institution			
<b>Short Description:</b> Admins can assign courses to institutions							
<b>Pre-conditions:</b> Admin must be logged in							
#	Institution	Expected Outcome	Actual Outcome	Remark			
1		Institution is required	Institution is required	Pass			
2	Daffodil International University	Assigned Successfully	Assigned Successfully	Pass			

<b>Test Case #27</b>				<b>Test Case Name:</b> Add Instructor			
<b>Short Description:</b> Admins or instructors can add a new instructor to a course							
<b>Pre-conditions:</b> Admin must be logged in, instructor trying to add another instructor must own the course							
#	Unique ID of Instructor	Expected Outcome	Actual Outcome	Remark			
1		Unique ID is required	Unique ID is required	Pass			
2	abcdefg	Unique ID is not valid	Unique ID is not valid	Pass			
3	b79501e0-a5c4-483d-90c7-f57e540cf005	Added Successfully	Added Successfully	Pass			

# Chapter 6: User Manual

This chapter shows how to operate different functionalities of the system step by step by including the screenshot of the user interfaces and marking key elements by red rectangular box in them

## 6.1 Landing Page:

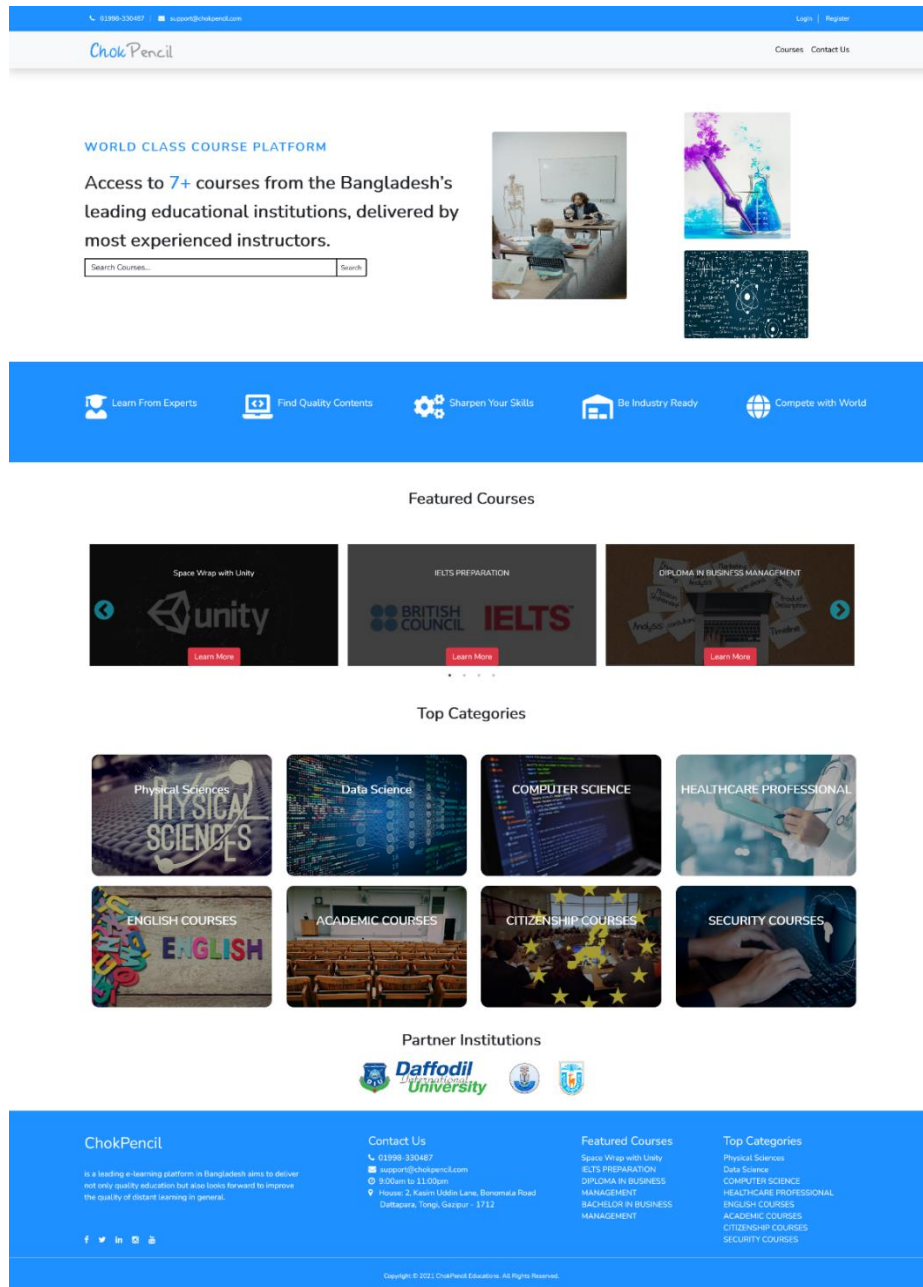


Figure 6.1.1: Landing Page

## 6.2 Registration Page:

Clicking “Register” link from header will open the student registration form.

The screenshot displays the ChokPencil registration page. At the top, a blue header contains the phone number 01998-330487, the email support@chokpencil.com, and links for Login and Register. Below the header, the ChokPencil logo is on the left, and Courses and Contact Us are on the right. The main content area features a 'Register as' section with two buttons: 'Student' (selected) and 'Instructor'. Below this is a 'Register' form with the following fields: Name (text input), E-Mail Address (text input), Study Level (dropdown menu with 'Please Select...' and a note 'Tell us what you're studying. We'll find best courses for you.'), Password (text input), and Confirm Password (text input). A blue 'Register' button is positioned at the bottom of the form. The footer is a blue bar with four columns: 'ChokPencil' with a mission statement, 'Contact Us' with phone, email, and address, 'Featured Courses' with a list including Space Wrap with Unity, IELTS PREPARATION, DIPLOMA IN BUSINESS MANAGEMENT, and BACHELOR IN BUSINESS MANAGEMENT, and 'Top Categories' with a list including Physical Sciences, Data Science, COMPUTER SCIENCE, HEALTHCARE PROFESSIONAL, ENGLISH COURSES, ACADEMIC COURSES, CITIZENSHIP COURSES, and SECURITY COURSES. Social media icons and a copyright notice are also present.

Figure 6.2.1: Student Registration

User can select to register as instructor by selecting the “Instructor” menu from upper menu from upper section marked in the image.

The screenshot displays the ChokPencil website interface. At the top, a blue header contains contact information (01998-330487, support@chokpencil.com) and navigation links (Login, Register). The ChokPencil logo is on the left, and 'Courses' and 'Contact Us' are on the right. A 'Register as' dropdown menu is highlighted with a red box, showing 'Student' and 'Instructor' options. Below this is the 'Instructor Registration' form, which includes fields for Name, Email, Password, Confirm Password, Qualification, Designation, Department, Institution, Phone (with a +880 prefix), Address, and an 'About' section. A 'Submit' button is at the bottom of the form. The footer contains the ChokPencil logo, contact details, featured courses, and top categories.

Figure 6.2.2: Instructor Registration

## 6.3 Login Page:

Login page are common for all types of users (student, instructor & admin)

The screenshot shows the ChokPencil login page. At the top, there is a blue header with the phone number 01998-330487 and email support@chokpencil.com on the left, and 'Login | Register' on the right. Below the header is a white navigation bar with the ChokPencil logo and 'Courses | Contact Us' links. The main content area is a white box titled 'Login' containing two input fields for 'E-Mail Address' and 'Password', a 'Remember Me' checkbox, and a blue 'Login' button. A 'Forgot Your Password?' link is located to the right of the login button. The footer is a blue bar with four columns: 'ChokPencil' (description), 'Contact Us' (phone, email, hours, address), 'Featured Courses' (Space Wrap with Unity, IELTS PREPARATION, DIPLOMA IN BUSINESS MANAGEMENT, BACHELOR IN BUSINESS MANAGEMENT), and 'Top Categories' (Physical Sciences, Data Science, COMPUTER SCIENCE, HEALTHCARE PROFESSIONAL ENGLISH COURSES, ACADEMIC COURSES, CITIZENSHIP COURSES, SECURITY COURSES). Social media icons and a copyright notice are also present in the footer.

Figure 6.3.1: Login Page



## 6.4 Instructor Dashboard:

Instructor will find the courses owned in the dashboard and quickly access by clicking “Resume” button on a course card.

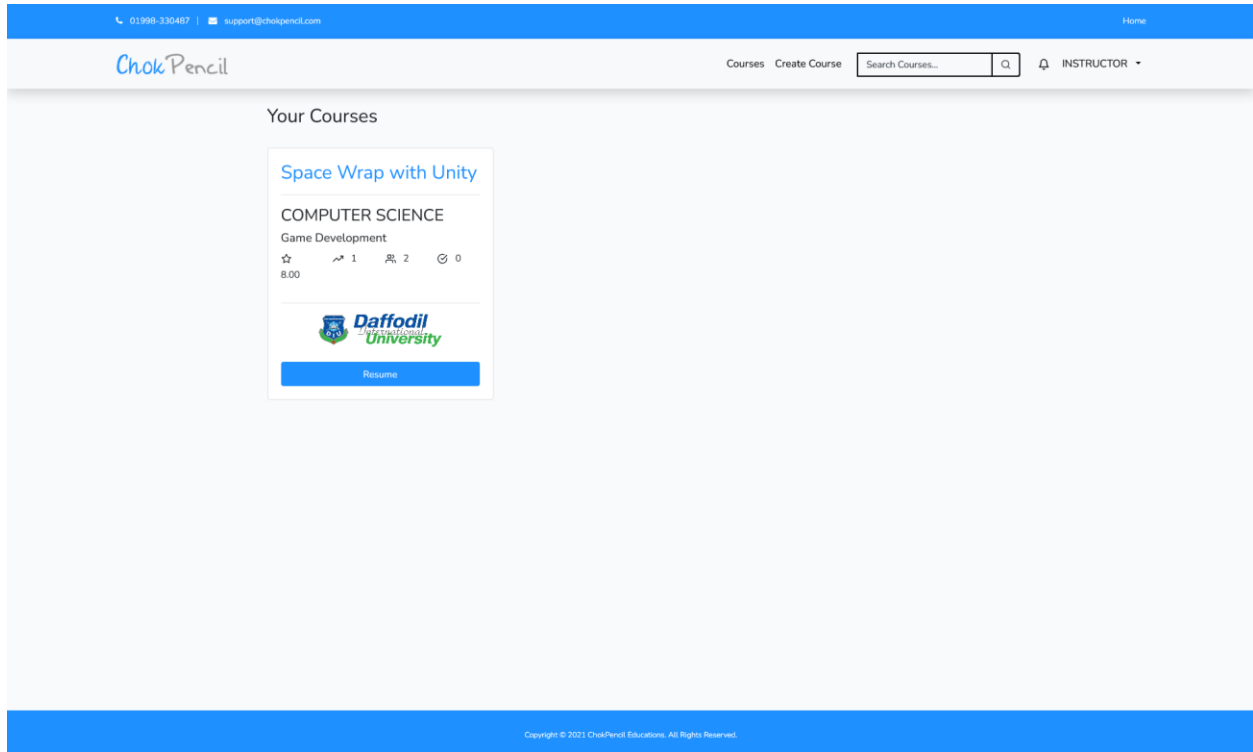


Figure 6.4.1: Instructor Dashboard

## 6.5 Create Course:

Verified instructor will see “Create Course” link in the header as marked in the image. To create a new course, user needs to click the link first.

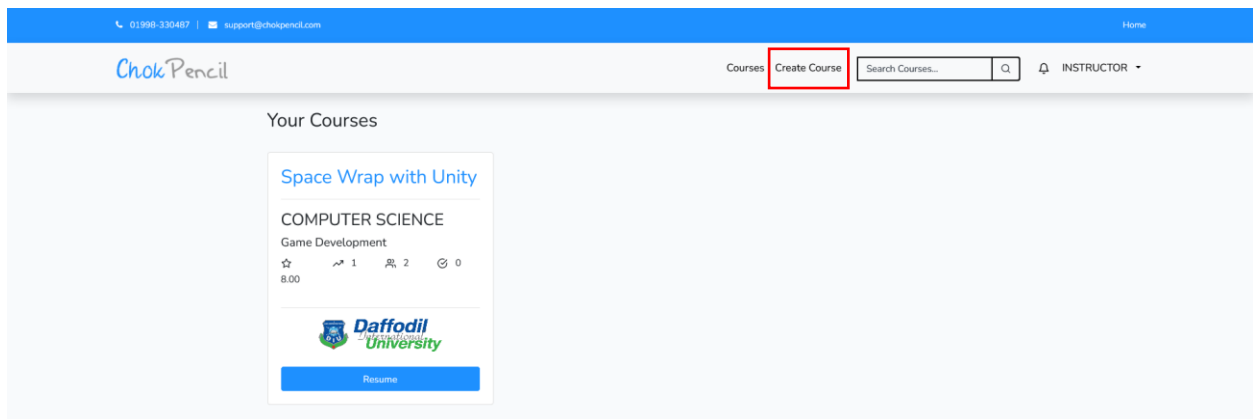


Figure 6.5.1: Create Course Link in Header

The course creation form will be opened. User will fillout the form with valid data and submit it. Course will be created.

The screenshot shows the 'Create Course' form in the Chok Pencil application. The form is titled 'Create Course' and contains the following fields and controls:

- Title \***: A text input field.
- Subtitle \***: A text input field with a hint '1 to 3 sentences'.
- Level \***: A dropdown menu with 'Please Select...' as the placeholder.
- Difficulty \***: A dropdown menu with 'Please Select...' as the placeholder.
- Duration \***: A text input field and a 'Select Unit' dropdown menu.
- Category \***: A dropdown menu with 'Please Select...' as the placeholder.
- Topic \***: A text input field.
- Starting From \***: A text input field with a hint 'mm / dd / yyyy'.
- Description \***: A rich text editor with a toolbar containing various formatting options like bold, italic, underline, link, and list.
- Required Marks to Complete the Course**: A text input field with a hint 'percentage(%)'.
- Course Fee**: A text input field and a 'Select Currency' dropdown menu.
- Course image**: A text input field for 'Image Name' and a 'Browse' button.
- Buttons**: 'Create' and 'Cancel' buttons at the bottom. The 'Create' button is highlighted with a red box.

The footer of the page contains the text: Copyright © 2021 ChokPencil Educations. All Rights Reserved.

Figure 6.5.2: Course Creation Form

## 6.6 Course Dashboard:

All course materials and course management functionalities will be available on the course dashboard. Course management functionalities are available for only instructors and admins.

The screenshot displays the ChokPencil Course Dashboard for an instructor or admin. The interface is clean and organized, featuring a blue header with contact information and a search bar. The main content area is divided into several sections:

- Space Wrap with Unity:** A large banner image with the Unity logo.
- Announcements:** A section containing two announcements with edit and delete options.
- Discussion Panel:** A section with a brief description of the discussion panel's purpose and a button to open it.
- Introduction:** A section with two items: 'Welcome to the course' and 'What is Unity and why Unity?'. Each item has edit and delete icons.
- Unity Setup:** A section with five items: 'Download Unity', 'Download Visual Studio', 'Unity Environment Setup', 'Written Guide', and 'Task 1'. Each item has edit and delete icons.
- Unity Components:** A section with five items: 'Scenes', 'Sprites', 'Prefabs', 'Quiz 1', and 'Quiz 2'. Each item has edit and delete icons.
- Test Module:** A section with one item: 'Test Assessment 2', which has edit and delete icons.

The footer of the dashboard includes the copyright notice: 'Copyright © 2021 ChokPencil Educations. All Rights Reserved.'

Figure 6.6.1: Course Dashboard (instructor & admin view)

01999-330487 | support@chokpencil.com Home

ChokPencil Courses  Q STUDENT ▾

## Space Wrap with Unity

### Announcements

- ⊙ Please keep the environment respectful & helpful throughout the whole course.
- ⊙ Post you queries & problems in the Course Discussion Panel. Also try to help others.

### Discussion Panel

Discussion panel is the medium of communication between students & course instructors in our fully online course platform. Any disrespectful behaviour will not be tolerated and will be addressed as soon as possible. **Anyone using hate speech will be punished and may be banned permanently from the platform.**

Open Discussion Panel

Progress: 33.333333333333%
Total Marks: 0
Average Marks: 0%

### Introduction

- ▶ Welcome to the course
- ▶ What is Unity and why Unity?

### Unity Setup

- 🔗 Download Unity
- 🔗 Download Visual Studio
- ▶ Unity Environment Setup
- 📄 Written Guide
- ✍ Task 1

### Unity Components

- 📄 Scenes
- 📄 Sprites
- 📄 Prefabs
- ✍ Quiz 1

### Test Module

No Contents Yet

Copyright © 2021 ChokPencil Educations. All Rights Reserved.

Figure 6.6.1: Course Dashboard (student view)

## 6.7 Create Course Module:

All course management options are available in the course dashboard. Instructors will click on the “Function button (gear icon)” on the upper right corner to select “Create Module” option.

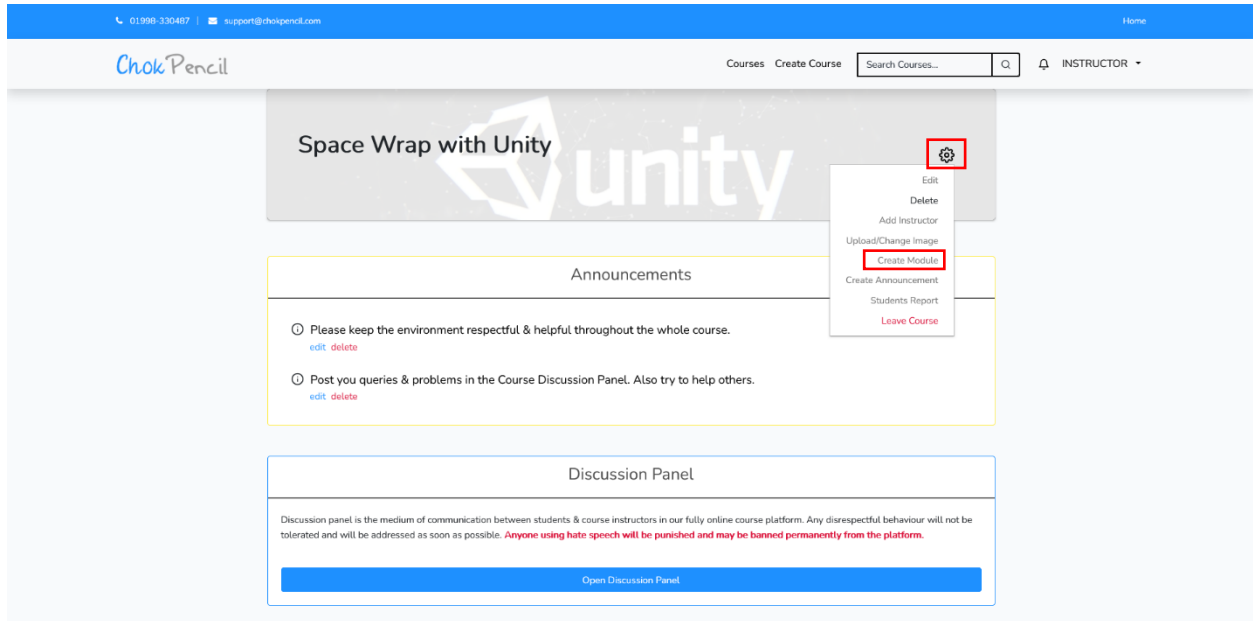


Figure 6.7.1: Functions on Course Dashboard (instructor view)

Module creation form will be opened. Instructor will give a valid and unique module name and submit the form. A new module will be created.

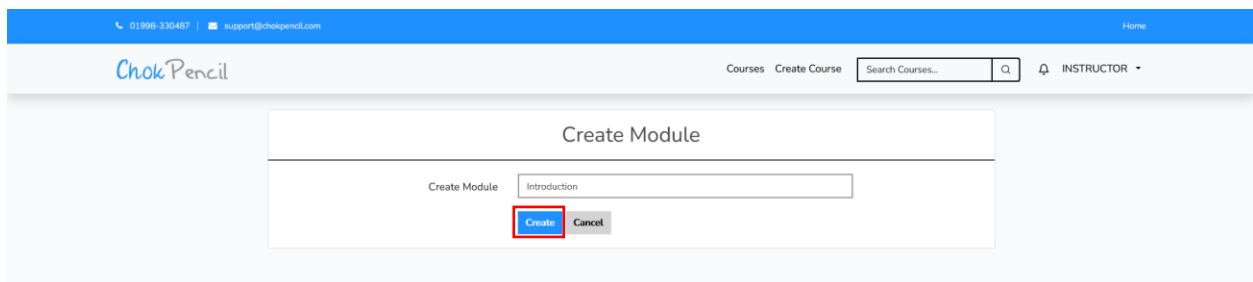


Figure 6.7.2: Module Creation Form

## 6.8 Create Content:

To create a new content instructor will visit course dashboard and click the “Function button (tool icon)” on the right of the module new content will be created. A dropdown menu will be opened where instructor can find “Create Content” option.

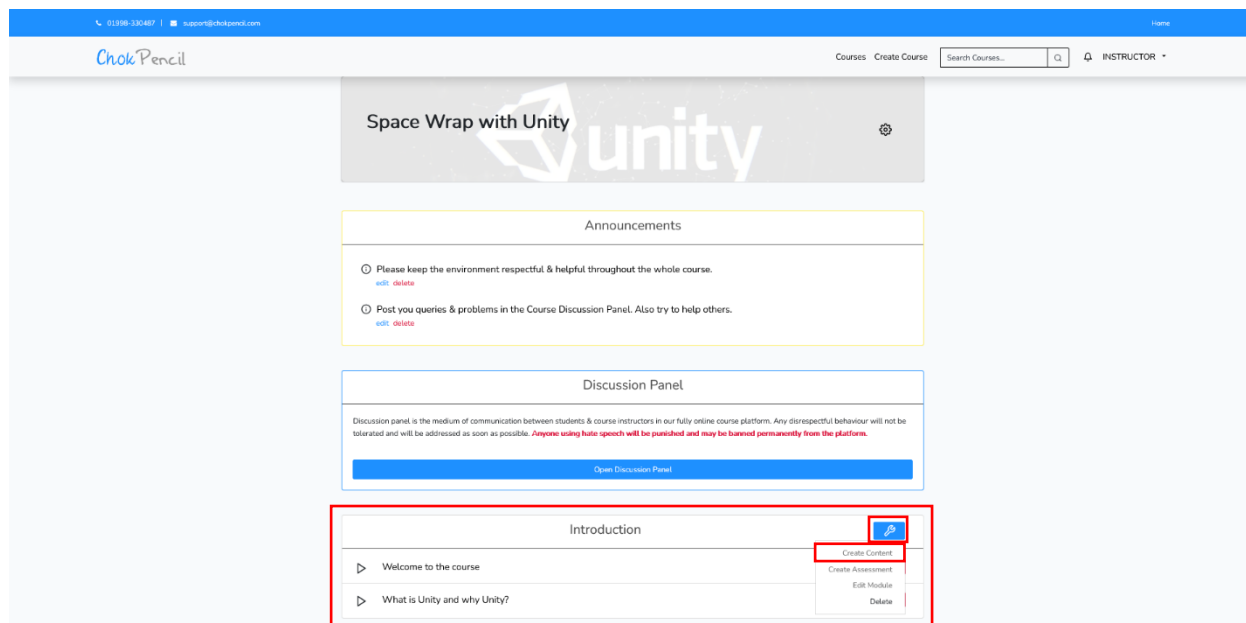


Figure 6.8.1: A Course Module and Related Functionalities (instructor view)

Clicking the “Create Content” option will open the content creation form. Instructor will fill the form with valid data and submit. A new content will be created.

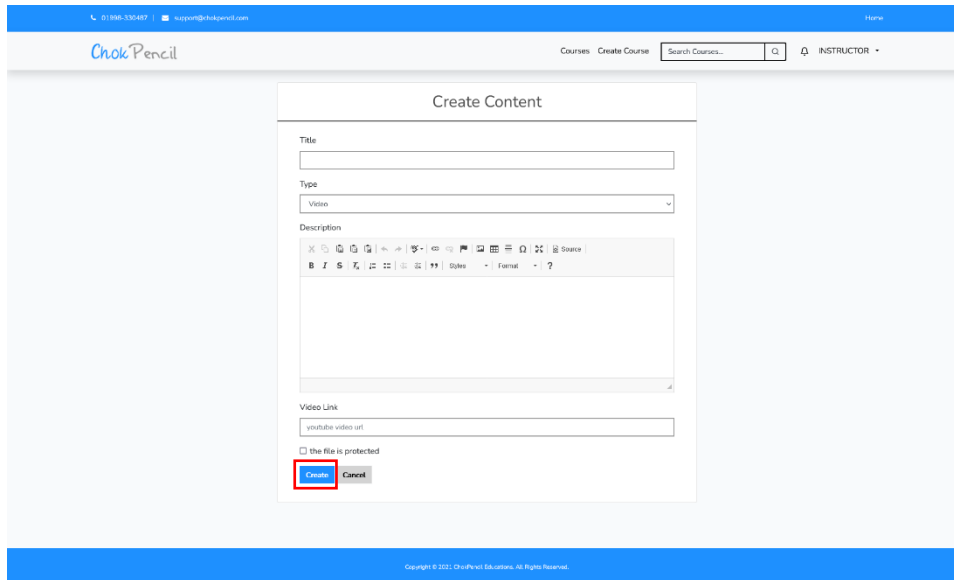


Figure 6.8.1: A Course Module and Related Functionalities (instructor view)

## 6.9 Create Assessment:

To create a new assessment instructor will visit course dashboard and click the “Function button (tool icon)” on the right of the module. A dropdown menu will be opened where instructor can find “Create Assessment” option.

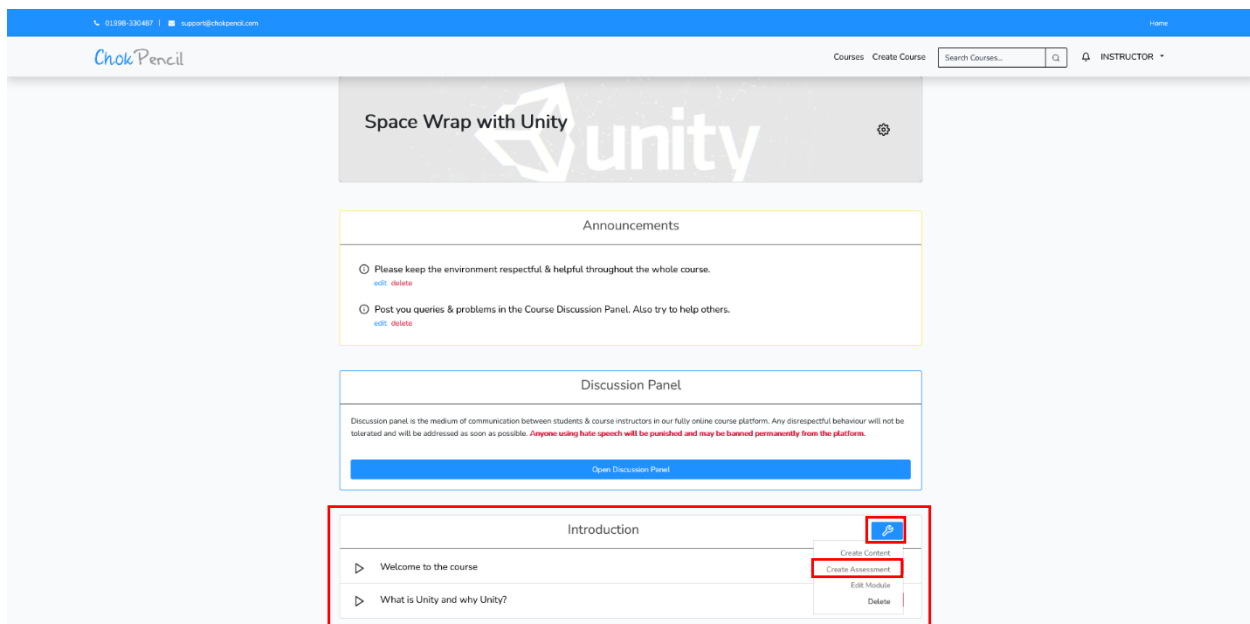


Figure 6.9.1: A Course Module and Related Functionalities (instructor view)

Clicking the “Create Assessment” option will open the content creation form. Instructor will fill the form with valid data and submit. A new assessment will be created.

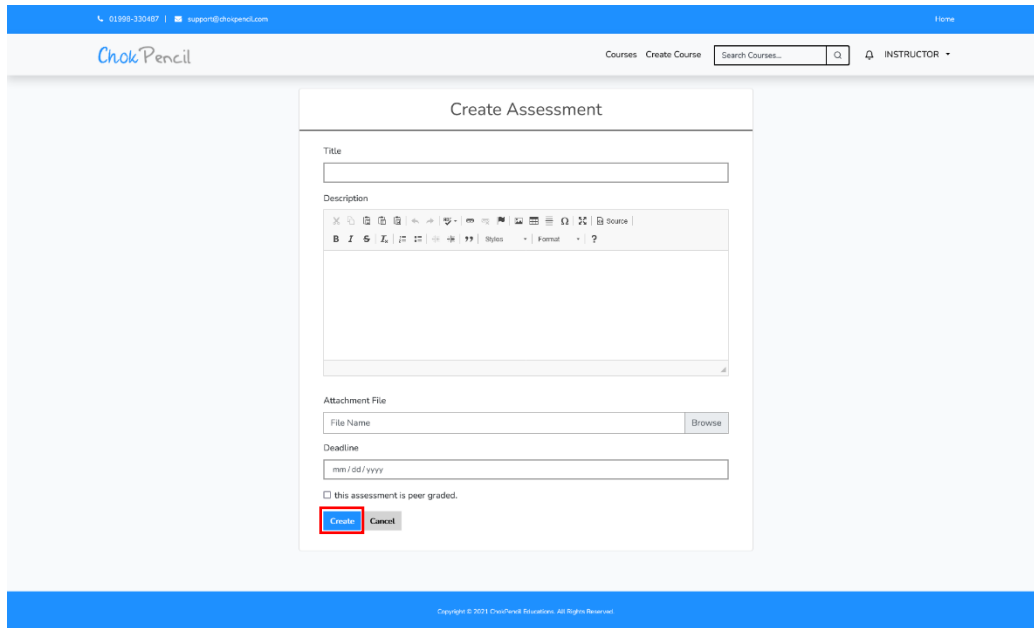


Figure 6.9.2: Assessment Creation Form

## 6.10 Create Question:

To create a new question instructor will visit the assessment, the question will belong to from the course dashboard.

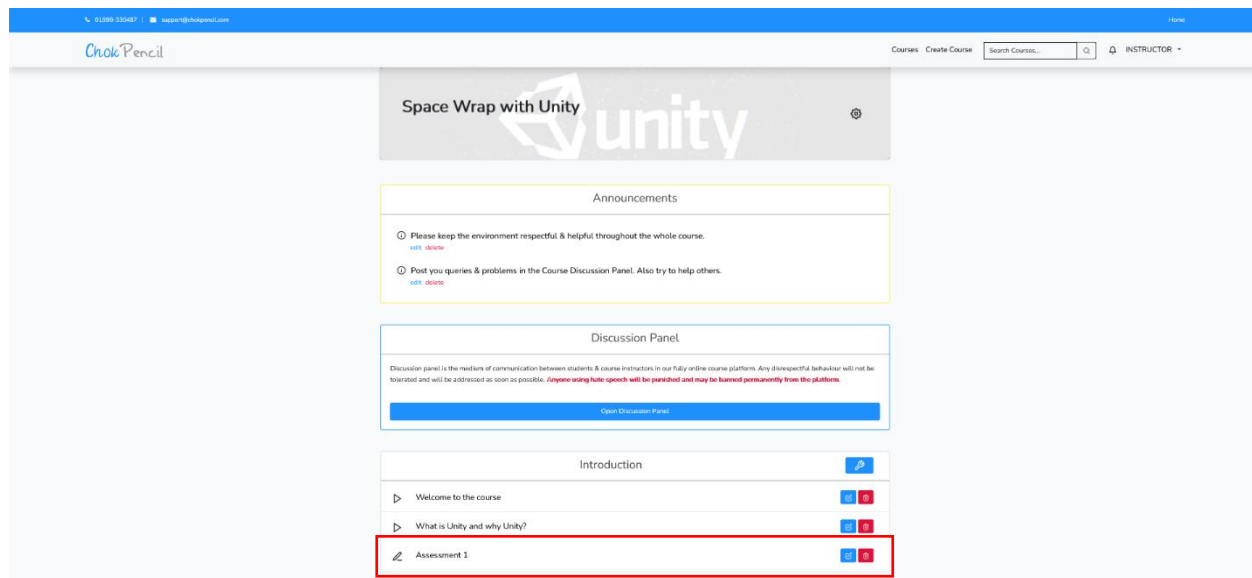


Figure 6.10.1: An Assessment on Course Dashboard (instructor view)

Clicking the assessment title will open the assessment page. From there, instructor will click “Create Question” button to create a new question.



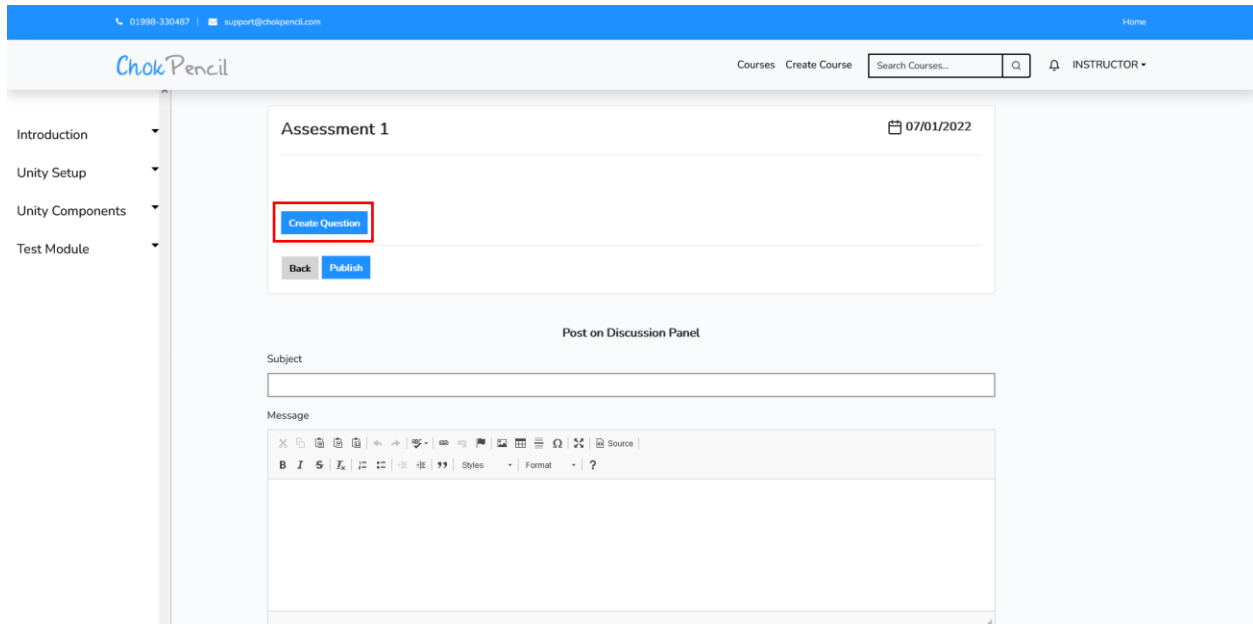


Figure 6.10.2: Assessment Page

Clicking “Create Question” button will open the question creation form. Instructor will fill out the form with valid data and submit it. A new question will be created.

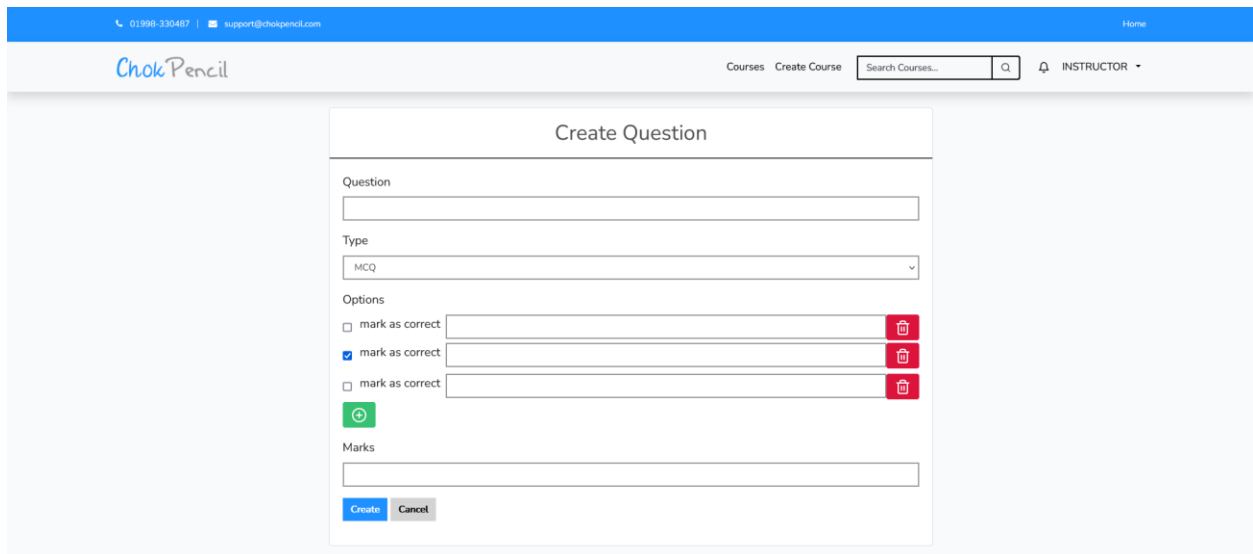


Figure 6.10.3: Question Creation Form

## 6.11 Publish Assessment:

After creating questions, instructor will publish the assessment so that it is visible to students of the course. To publish the assessment, instructor needs to visit the assessment page and click “Publish” button.

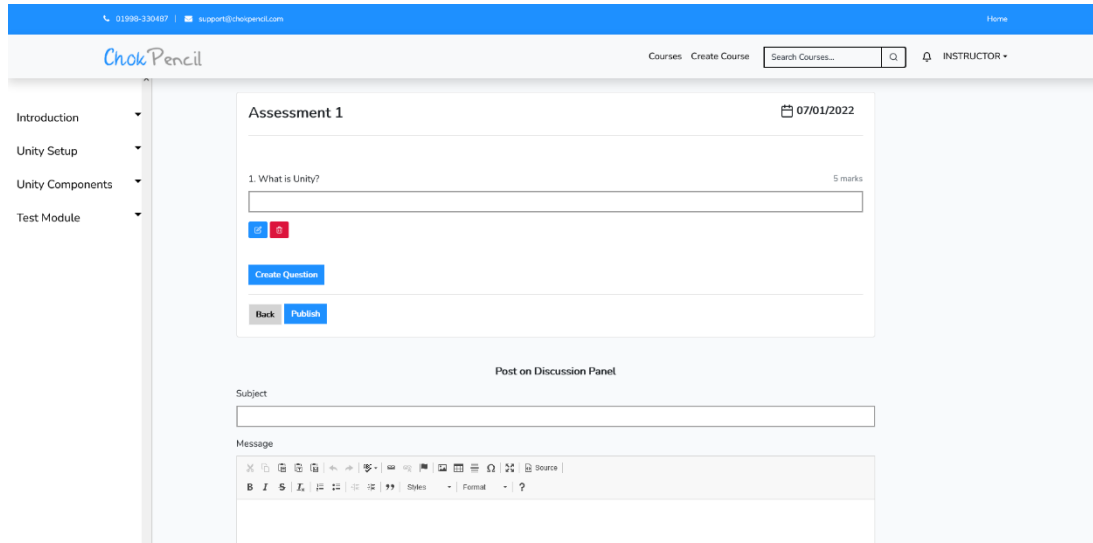


Figure 6.11.1: Publish Assessment

## 6.12 Add Instructor:

To add a new instructor into the course, instructor already own the course will visit the course dashboard. On the upper right corner of the page there is a “Function button (gear icon)”. Clicking the button will reveal options in dropdown. Selecting “Add Instructor” button will take to a new page.

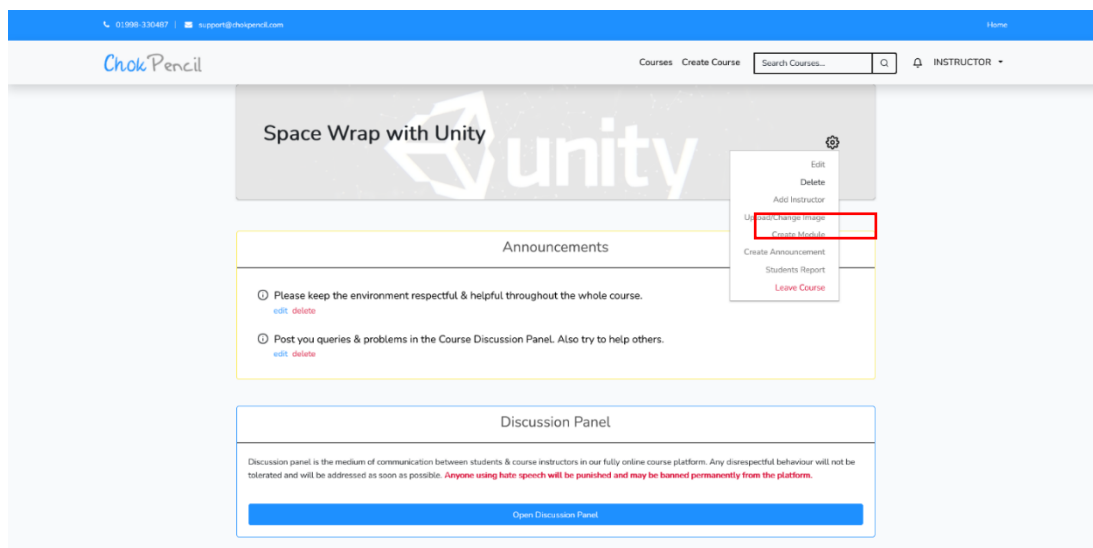
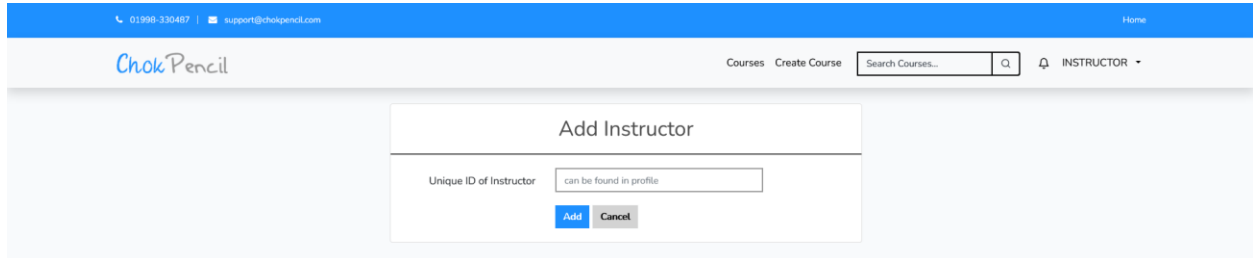


Figure 6.12.1: Functions on Course Dashboard (instructor view)

Instructor will paste the “Unique ID” of the new Instructor which can be found in the profile page of each instructor’s profile page and submit the form. If the “Unique ID” is valid, the new instructor will be added to the course.



The screenshot shows the Chok Pencil web interface. At the top, there is a blue header with contact information: a phone icon, the number 01990-330487, an email icon, and the address support@chokpencil.com. On the right side of the header is a 'Home' link. Below the header, the Chok Pencil logo is on the left, and navigation links for 'Courses' and 'Create Course' are in the center. To the right of these links is a search bar labeled 'Search Courses...' with a magnifying glass icon. Further right is a user profile icon and the text 'INSTRUCTOR' with a dropdown arrow. The main content area features a white box titled 'Add Instructor'. Inside this box, there is a label 'Unique ID of Instructor' followed by a text input field containing the placeholder text 'can be found in profile'. Below the input field are two buttons: a blue 'Add' button and a grey 'Cancel' button.

Figure 6.12.2: Add Instructor Form

## 6.13 Course Index Page:

This page contains all the courses of the system. Courses are paginated 5 per page.

The screenshot shows the Chok Pencil Course Index Page from a student's perspective. The page features a blue header with the Chok Pencil logo, contact information (01999-330487, support@chokpencil.com), and a search bar. Below the header, the word "Courses" is displayed in a large font. The main content area lists five courses, each with a card containing an image, course title, level, duration, start date, price, and a "RESUME" or "ENROLL" button. A pagination bar at the bottom shows "1 2" and a "wishlist for later" link.

Course Name	Level	Duration	Start Date	Price	Action
Space Wrap with Unity	Undergraduate	8.00/10 (1)	09/10/2021	500.00 BDT	RESUME
IELTS PREPARATION	Undergraduate	0.00/10 (0)	07/10/2021	100.00 USD	ENROLL
BUSINESS ENGLISH LANGUAGE COURSE	Secondary	0.00/10 (0)	08/10/2021	Free	ENROLL
GENERAL ENGLISH LANGUAGE COURSE	Undergraduate	0.00/10 (0)	28/12/2021	250.00 GBP	ENROLL
Mandatory+SATUTORY Training	Secondary	0.00/10 (0)	28/12/2021	55.00 GBP	ENROLL

Figure 6.13.1: Course Index Page (student view)

As instructors cannot enroll courses the “Enroll” buttons are disabled or replaced by “Resume” button.

The screenshot displays the Chok Pencil Course Index Page in instructor view. The page features a blue header with contact information (01 996 330487, support@chokpencil.com) and a navigation bar with 'Courses', 'Create Course', and a search bar. The main content area is titled 'Courses' and lists five courses, each with a thumbnail, title, details, and a button.

Course Title	Level	Duration	Start Date	Price	Button
Space Wrap with Unity	Undergraduate	3 Weeks	09/10/2021	500.00 BDT	RESUME
IELTS PREPARATION	Undergraduate	6-11 Years	07/10/2021	100.00 USD	ENROLL
BUSINESS ENGLISH LANGUAGE COURSE	Secondary	6-11 Months	08/10/2021	Free	ENROLL
GENERAL ENGLISH LANGUAGE COURSE	Undergraduate	8-12 Weeks	28/12/2021	250.00 GBP	ENROLL
Mandatory+SATUTORY Training	Secondary	1 Days	28/12/2021	55.00 GBP	ENROLL

Figure 6.13.2: Course Index Page (instructor view)

## 6.14 Course Details Page:

This page contains all the details of a course. Clicking the course title in course index page will open this page.

01999-330497 | support@chokpencil.com Home

ChokPencil Courses Search Courses... Q STUDENT

### Space Wrap with Unity

Learn to make exciting games in most popular game engine Unity without any prior knowledge on game development.

★ 8.00/10 on 1 ratings

**RESUME**

2 students currently enrolled

Certified By **Daffodil International University**

#### COURSE DESCRIPTION

**Overview**

Learn to make 2D games with Unity developing a real indie game.

**Description**

This course is intended for beginners interested in game development with no prior knowledge. Through the course student will learn about basics of not only Unity programming but also other components of Unity. Prior knowledge of object oriented programming will be helpful but not required. At the end of the course, a real fully functional 2D game will be built. Although this course will not cover building graphics assets for the game.

**Module Structure**

- Introduction
- Unity Setup with Visual Studio as default code editor
- Scenes, Assets, Scripts, Sprites, Prefabs
- Basic Script
- Rigid Bodies & Colliders
- Timers, Awake & Start
- Update & Fixed Update
- Classes & Objects
- Spawning & Destroying
- Forces, Angles and Direction
- Building the Game

**Requirements**

**Knowledge of:**

1. Basic Maths
2. Basic Physics
3. Basic Programming
4. Object Oriented Programming Concept

**INSTRUCTORS**

**INSTRUCTOR**

Lecturer, Institution  
20years of experience

**Reviews**

**STUDENT**

09/10/2021  
Best course for unity beginners.

**CATEGORY: COMPUTER SCIENCE**

**TOPIC: Game Development**

**LEVEL: Undergraduate**

**DURATION: 3 Weeks**

**STARTS: 09/10/2021**

**FEE: 500.00 BDT**

**Offers Certificate**

**Enquire About Course**

Name

Email

Phone

Enquiry

**Enquire**

Copyright © 2021 ChokPencil Education. All Rights Reserved.

Figure 6.14.1: Course Details Page

## 6.15 Student Dashboard:

Students can find their enrolled courses in dashboard and use “Resume” button on a course card to quickly visit the course dashboard.

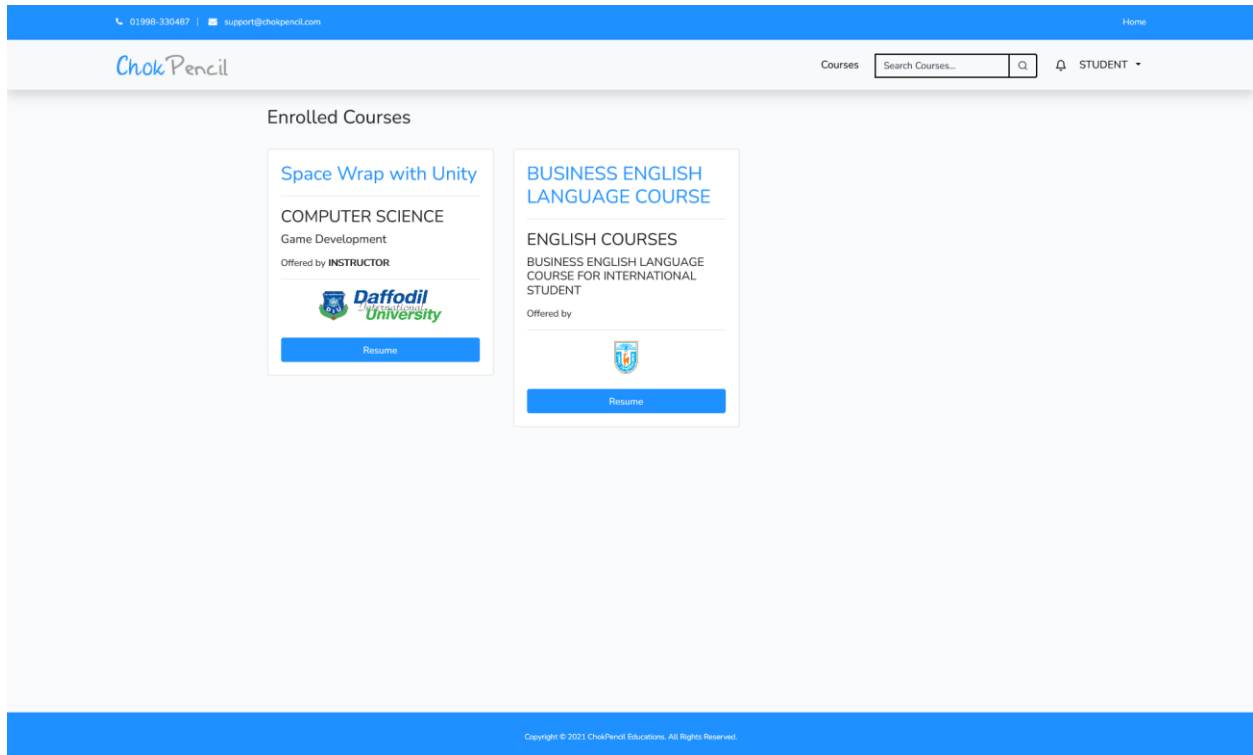


Figure 6.15.1: Student Dashboard

## 6.16 Search Course:

Courses can be searched from search box placed on header.

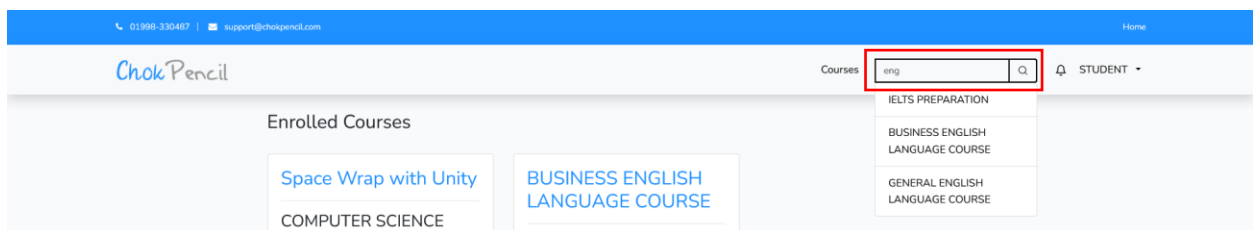


Figure 6.16.1: Search Course from Header Search Box

Clicking on a course on the dropdown will take the user to the course details page of that course. Or clicking the “Search button (magnifying glass icon)” will take to search results page.

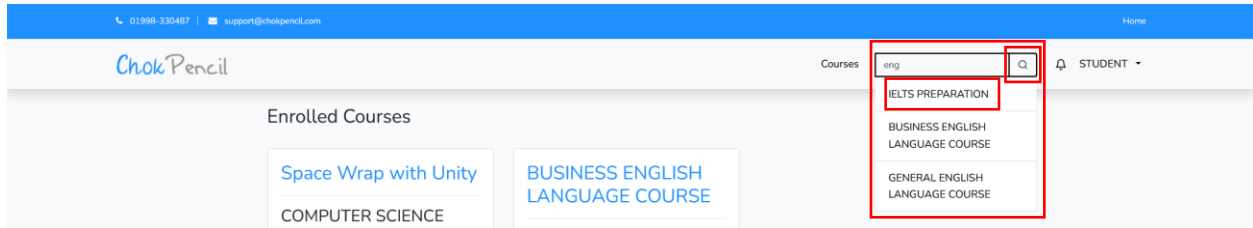


Figure 6.16.2: Search Suggestions Dropdown

Search Results page displays all the courses matching search string.

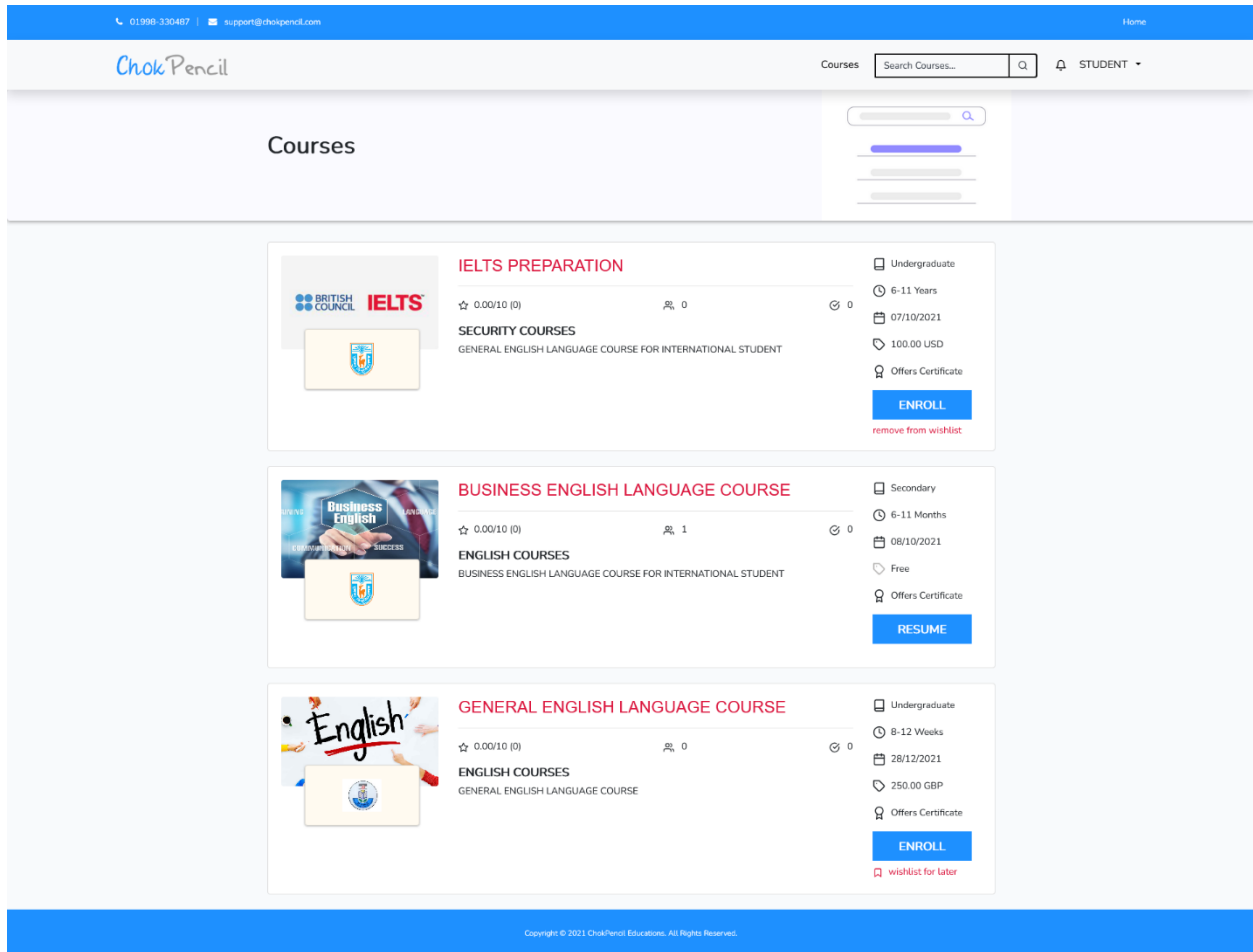


Figure 6.16.3: Search Results Page



Courses can also be searched from the landing page search box.

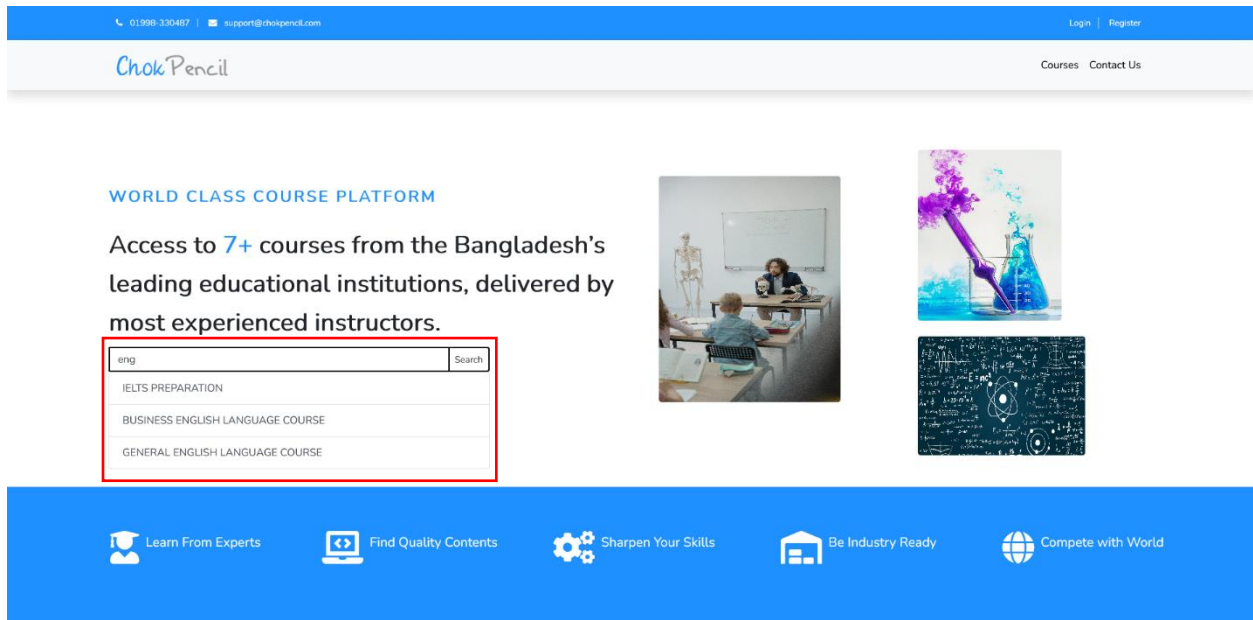


Figure 6.16.4: Search from Landing Page Search Box

## 6.17 Wishlist Course:

Students can wishlist a course to find easily later by clicking the “Wishlist for Later” button either from the course card from course index page or search results page, or from course details page.

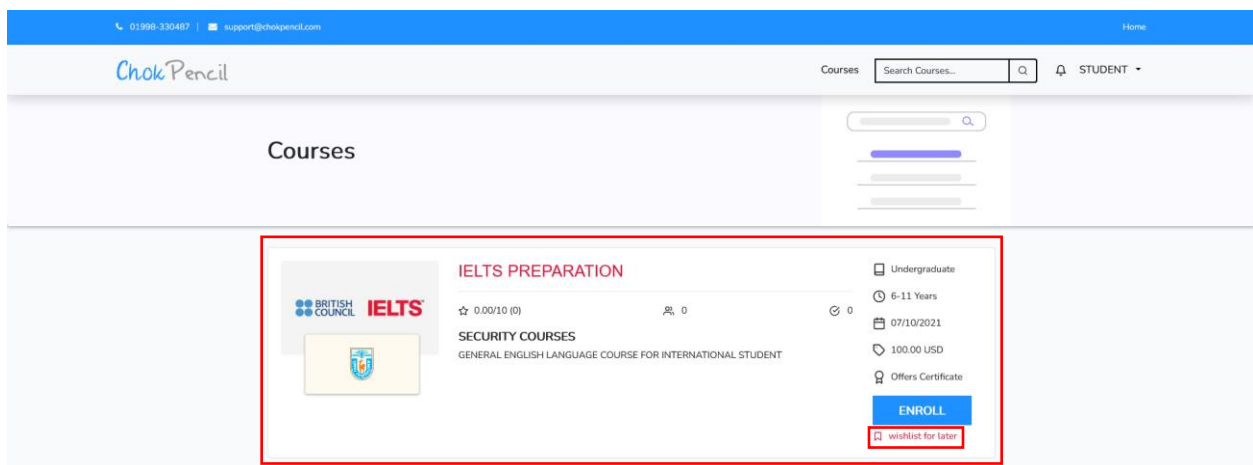


Figure 6.17.1: Wishlist for Later Button on a Course Card

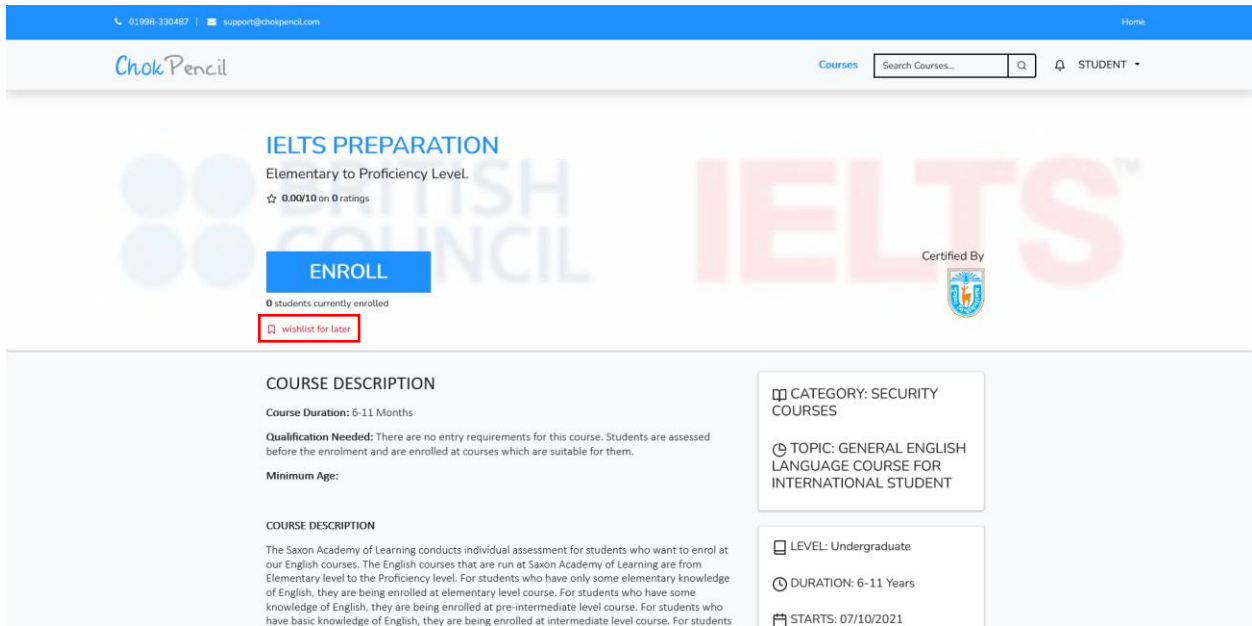


Figure 6.17.2: Wishlist for Later Button on a Course Details Page

Wishlisted courses can be accessed from header dropdown

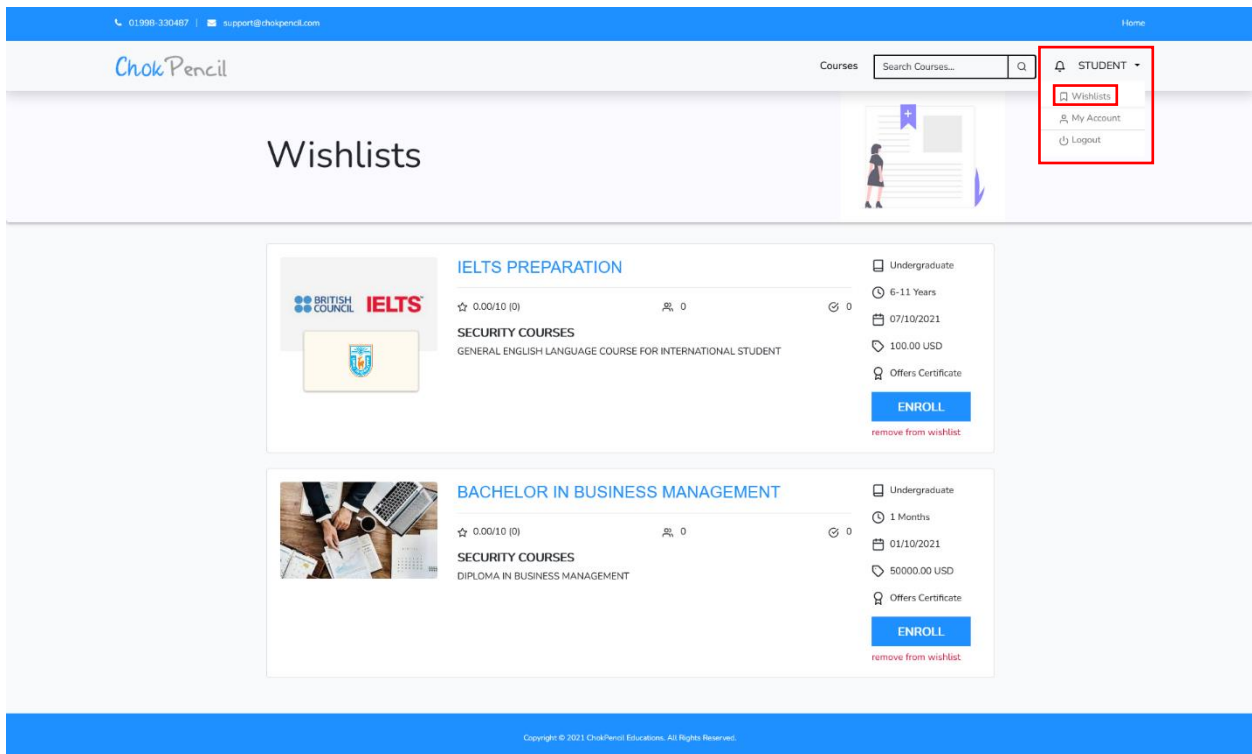


Figure 6.17.3: Wishlists Page

## 6.18 Enroll Course:

Students can enroll a course by clicking the “Enroll” button either from the course card from course index page or search results page or wishlists page, or from course details page.

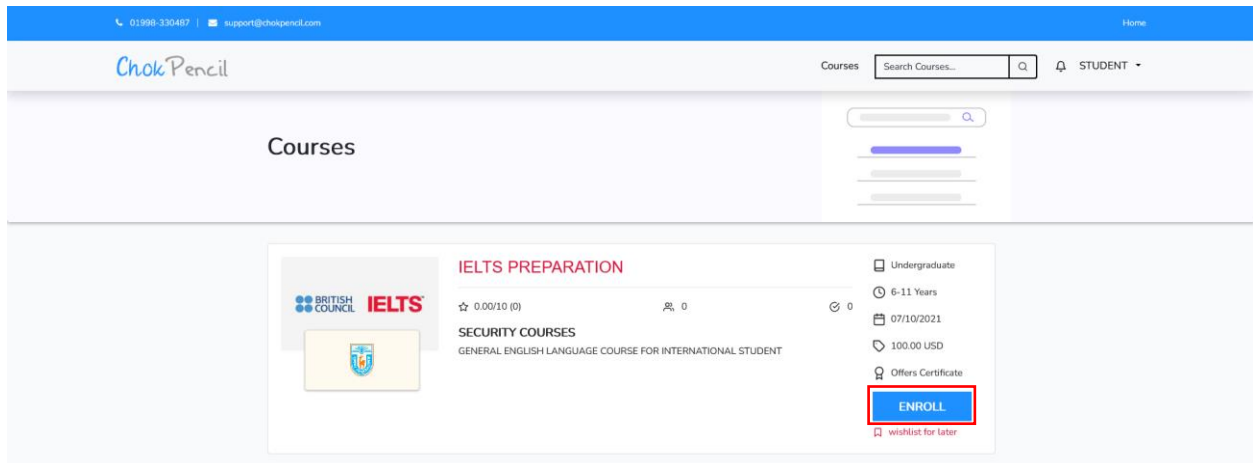


Figure 6.18.1: Enroll Button on a Course Card

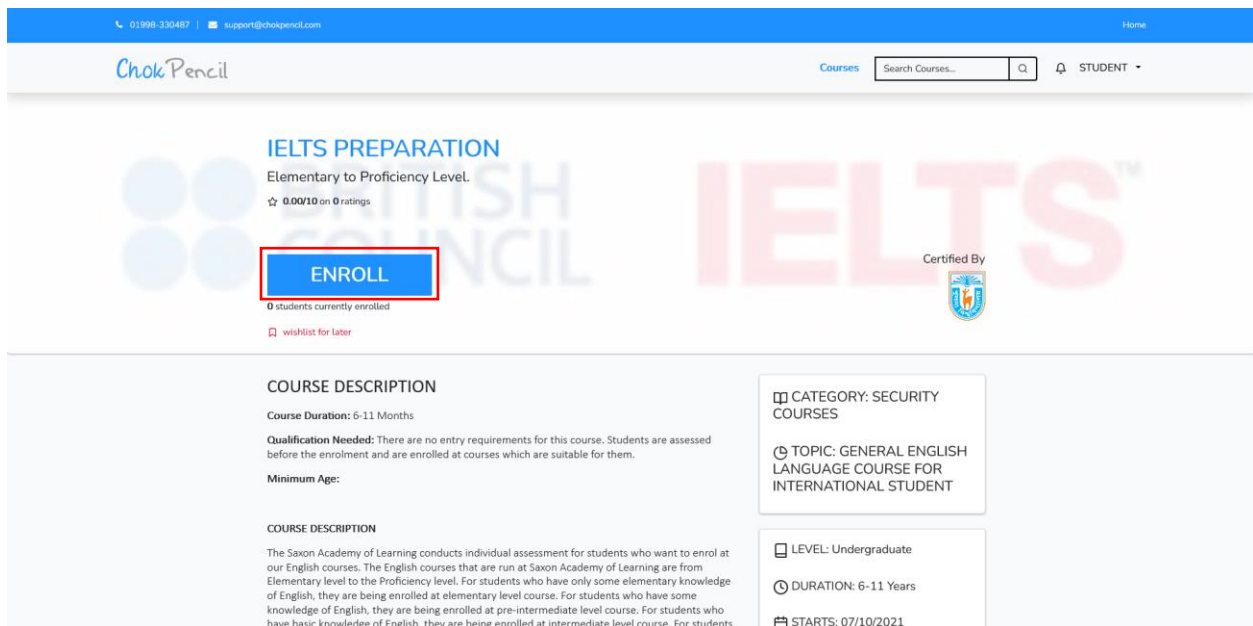


Figure 6.18.2: Enroll Button on a Course Details Page

If the course is free then enrollment will be completed immediately after clicking the button and student will be redirected to the course dashboard. If the course is paid, then clicking the button will redirect to payment page.

## 6.19 Payment:

Attempting to enroll paid courses will take user to payment page. The system has two payment methods. To make payment user will fill out the form and submit.

The screenshot shows the ChokPencil website's payment interface. At the top, there is a navigation bar with contact information (01998-330487, support@chospencil.com) and a 'Home' link. Below this is a header with the ChokPencil logo, a 'Courses' menu, a search bar, and a 'STUDENT' dropdown. The main content area features a 'Payment Method' section with two options: 'International Cards' and 'Mobile Banking'. The 'Mobile Banking' option is selected and highlighted with a red box. Below this is a table with two rows of account information:

#	Method	Account No.	Account Type
1	BKash	01998330487	Personal
2	Rocket	01998330487	Personal

Below the table, a note states: "Please pay 500.00 BDT to any of the above accounts & give the payment information below." The main form is titled 'Payment' and contains the following fields:

- Payment Method: A dropdown menu with 'Please Select...' as the current selection.
- Account No.: A text input field with a '+880' prefix button.
- Transaction ID: A text input field.
- Amount: A text input field with '500.00' pre-filled.
- Reference: A text input field.
- Buttons: 'Cancel' and 'Submit' buttons, with 'Submit' highlighted by a red box.

At the bottom of the page, there is a blue footer with the text: "Copyright © 2021 ChokPencil Educations. All Rights Reserved."

Figure 6.19.1: Payment Page (Mobile Banking)

If user selects the “Cards” method by clicking “International Cards” link from the upper menu, the card payment page will appear as below. User will fill out the form & submit.

The screenshot shows the ChokPencil website's payment interface for card payments. The navigation bar and header are identical to the previous screenshot. In the 'Payment Method' section, the 'International Cards' option is selected and highlighted with a blue box. Below this is a 'Cards Payment' form with the following fields:

- Name on Card \*: A text input field.
- Card Information \*: A text input field.
- Reference\*: A text input field with the placeholder text 'name of the student'.
- Amount \*: A text input field with a note below it: 'amount must be 500.00'.
- Buttons: 'Cancel' and 'Pay Now' buttons, with 'Pay Now' highlighted by a red box.

Figure 6.19.2: Payment Page (Card Payment)

## 6.20 View Course Content:

Once enrolled into the course, the student can access all course contents through course dashboard. To view a specific content user needs to click on the “Content Title”.

The screenshot shows the ChokPencil course dashboard for the course "Space Wrap with Unity". The dashboard includes a header with contact information, a search bar, and a navigation menu. The main content area is divided into several sections: Announcements, Discussion Panel, Progress, Introduction, Unity Setup, Unity Components, and Test Module. The "Introduction" section contains two items, with "What is Unity and why Unity?" highlighted by a red box. The "Unity Setup" section lists various resources like "Download Unity", "Download Visual Studio", "Unity Environment Setup", "Written Guide", and "Task 1". The "Unity Components" section lists "Scenes", "Sprites", "Prefabs", and "Quiz 1". The "Test Module" section shows "No Contents Yet".

01999-330487 | support@chokpencil.com Home

ChokPencil Courses Search Courses... STUDENT

### Space Wrap with Unity

#### Announcements

- Please keep the environment respectful & helpful throughout the whole course.
- Post you queries & problems in the Course Discussion Panel. Also try to help others.

#### Discussion Panel

Discussion panel is the medium of communication between students & course instructors in our fully online course platform. Any disrespectful behaviour will not be tolerated and will be addressed as soon as possible. **Anyone using hate speech will be punished and may be banned permanently from the platform.**

[Open Discussion Panel](#)

Progress: 33.33333333333333% Total Marks: 0 Average Marks: 0%

#### Introduction

- Welcome to the course
- What is Unity and why Unity?**

#### Unity Setup

- [Download Unity](#)
- [Download Visual Studio](#)
- [Unity Environment Setup](#)
- [Written Guide](#)
- [Task 1](#)

#### Unity Components

- [Scenes](#)
- [Sprites](#)
- [Prefabs](#)
- [Quiz 1](#)

#### Test Module

No Contents Yet

Copyright © 2021 ChokPencil Educations. All Rights Reserved.

Figure 6.20.1: A Content on Course Dashboard

Clicking the content title will open the content page.

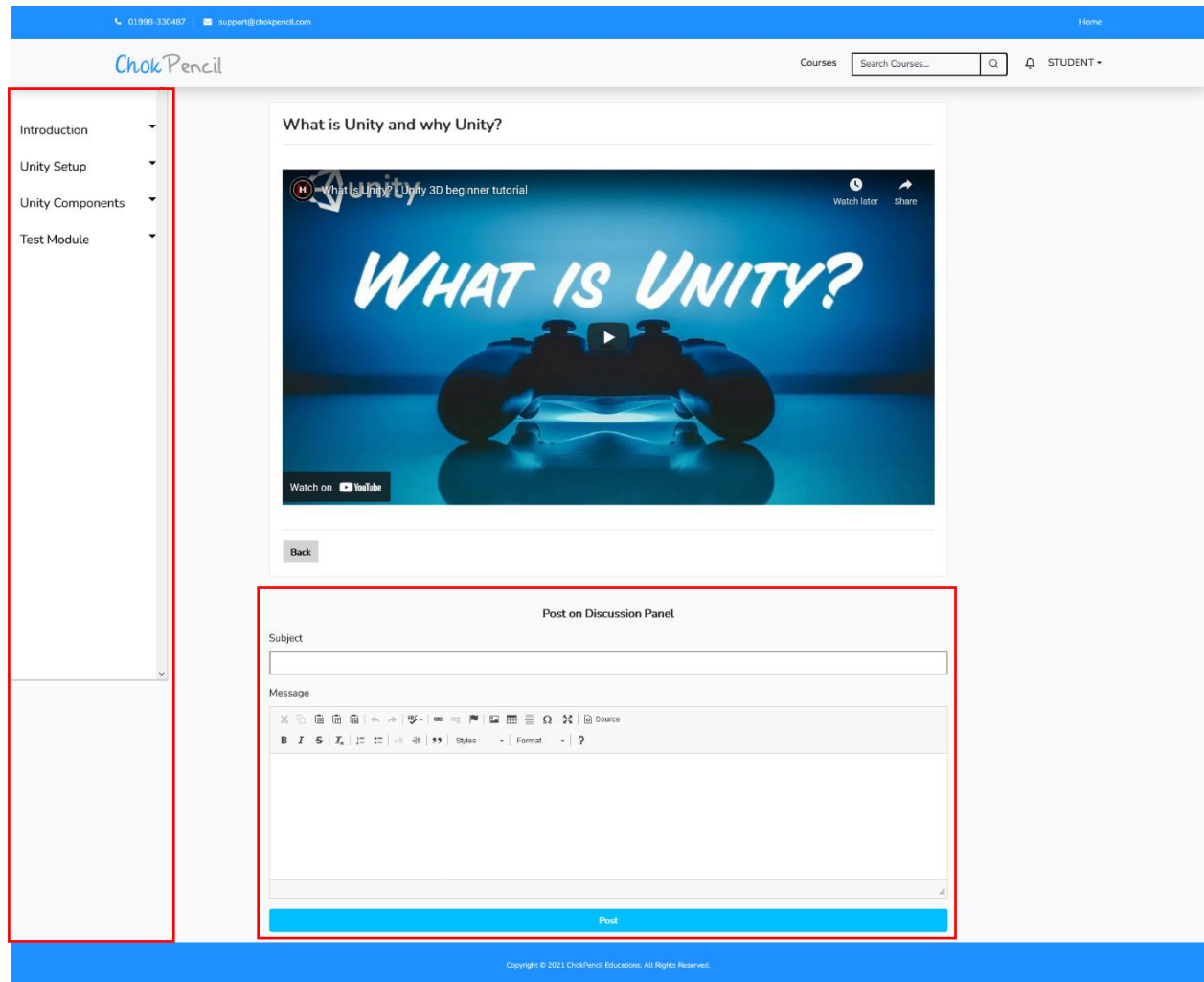


Figure 6.20.2: Content Page

User can view the full content here. Can easily navigate to any other content from the content navigation bar located on the left side of the page. Can also post queries about that content in the course discussion panel from the form below the content.

## 6.21 Submit Assessments:

Students can access all assessments through the course dashboard. To view a specific assessment, user needs to click on the “Assessment Title”.

The screenshot shows the ChokPencil course dashboard for the course "Space Wrap with Unity". The dashboard includes a header with contact information and a search bar. The main content area is divided into several sections: Announcements, Discussion Panel, Progress (33.33333333333333%), Total Marks (0), Average Marks (0%), Introduction (Welcome to the course, What is Unity and why Unity?), Unity Setup (Download Unity, Download Visual Studio, Unity Environment Setup, Written Guide, Task 1), Unity Components (Scenes, Sprites, Prefabs, Quiz 1), and Test Module (No Contents Yet). The "Quiz 1" item in the Unity Components section is highlighted with a red box.

01999-330487 | support@chospencil.com Home

ChokPencil Courses Search Courses... STUDENT

### Space Wrap with Unity

#### Announcements

- Please keep the environment respectful & helpful throughout the whole course.
- Post you queries & problems in the Course Discussion Panel. Also try to help others.

#### Discussion Panel

Discussion panel is the medium of communication between students & course instructors in our fully online course platform. Any disrespectful behaviour will not be tolerated and will be addressed as soon as possible. **Anyone using hate speech will be punished and may be banned permanently from the platform.**

Open Discussion Panel

Progress: 33.33333333333333% Total Marks: 0 Average Marks: 0%

#### Introduction

- Welcome to the course
- What is Unity and why Unity?

#### Unity Setup

- Download Unity
- Download Visual Studio
- Unity Environment Setup
- Written Guide
- Task 1

#### Unity Components

- Scenes
- Sprites
- Prefabs
- Quiz 1

#### Test Module

No Contents Yet

Copyright © 2021 ChokPencil Educations. All Rights Reserved.

Figure 6.21.1: An Assessment on Course Dashboard

Clicking the “Assessment Title” will open the Assessment Page.

The screenshot displays the ChokPencil assessment interface. At the top, there is a blue header with contact information (01990-330487, support@chokpencil.com) and a 'Home' link. Below the header, the 'ChokPencil' logo is on the left, and a 'Courses' search bar and 'STUDENT' profile are on the right. A left-hand navigation menu lists 'Introduction', 'Unity Setup', 'Unity Components', and 'Test Module'. The main content area is titled 'Quiz 1' with a date of '05/11/2022'. It contains a PDF viewer for 'Building and Distributing a Unity Web Player Game.pdf' and six questions:

- 1. What is Unity? (5 marks) - Multiple choice with options: A Programming Language, A Desktop Application, A Game Engine, An IDE. Marks Obtained: 5.
- 2. Prefabs are? (2.5 marks) - Multiple choice with options: Game Objects, Unity Component, C# Function. A 'Submit' button is present.
- 3. What is the function of Awake method? (5 marks) - Text input field. A 'Submit' button is present.
- 4. Describe Unity Components (10 marks) - Rich text editor with a toolbar (bold, italic, underline, link, unlink, list, indent, outdent, undo, redo, source) and a 'Submit' button.
- 5. Submit your code (20 marks) - File upload field with 'File Name' and 'Browse' buttons. Marks Obtained: Pending Review.
- 6. Submit your Unity WebGL link (25 marks) - Text input field. Marks Obtained: 20.

At the bottom of the quiz, there is a 'Back' button. Below the quiz is a 'Post on Discussion Panel' section with a 'Subject' text field and a 'Message' rich text editor with a toolbar, followed by a 'Post' button. The footer contains the copyright notice: 'Copyright © 2021 ChokPencil Educations. All Rights Reserved.'

Figure 6.21.1: Assessment Page

Students can type or select answer and click submit button to submit assessments question-wise.



## 6.22 Grade Assessments:

Instructors can grade assessments submitted by Students. Instructor will open an assessment page and click “Responses” button under a question to grade answers submitted to that question.

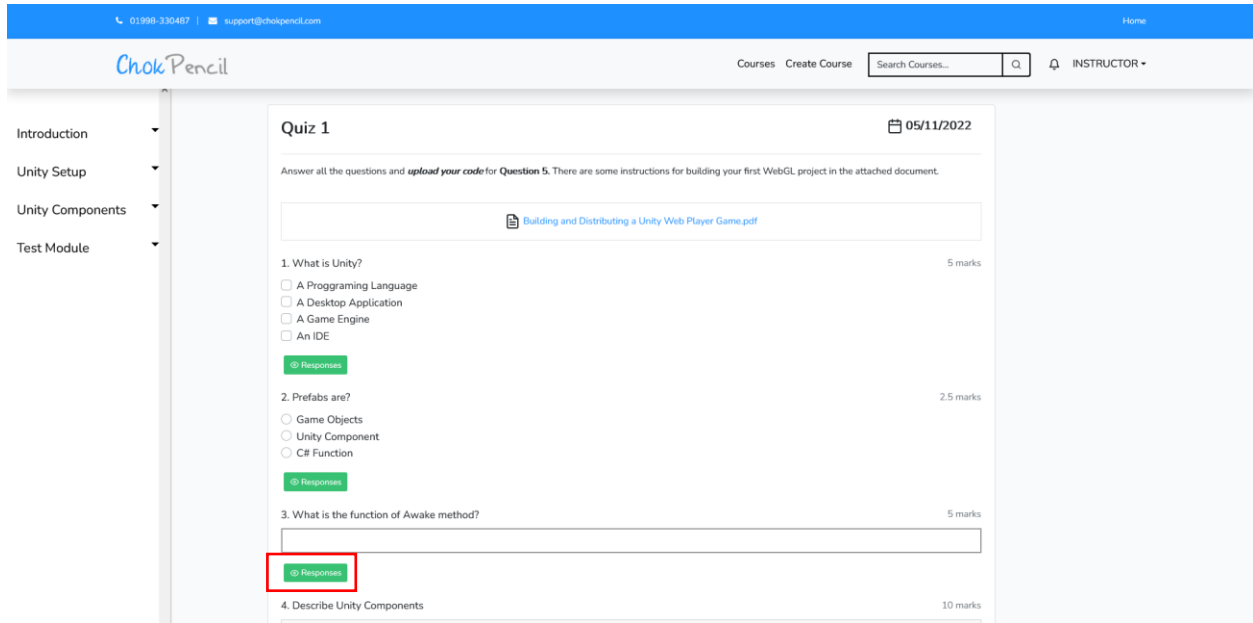


Figure 6.22.1: Responses button on Assessment Page

Clicking Responses button will redirect to responses page. Instructor will give marks and submit.

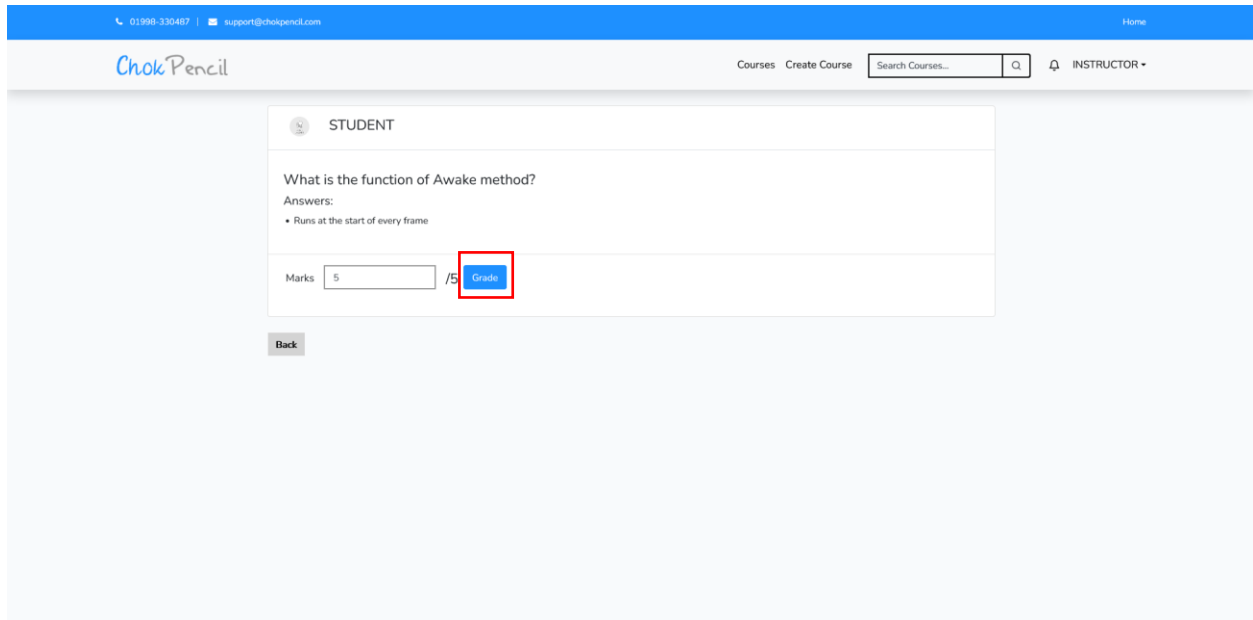
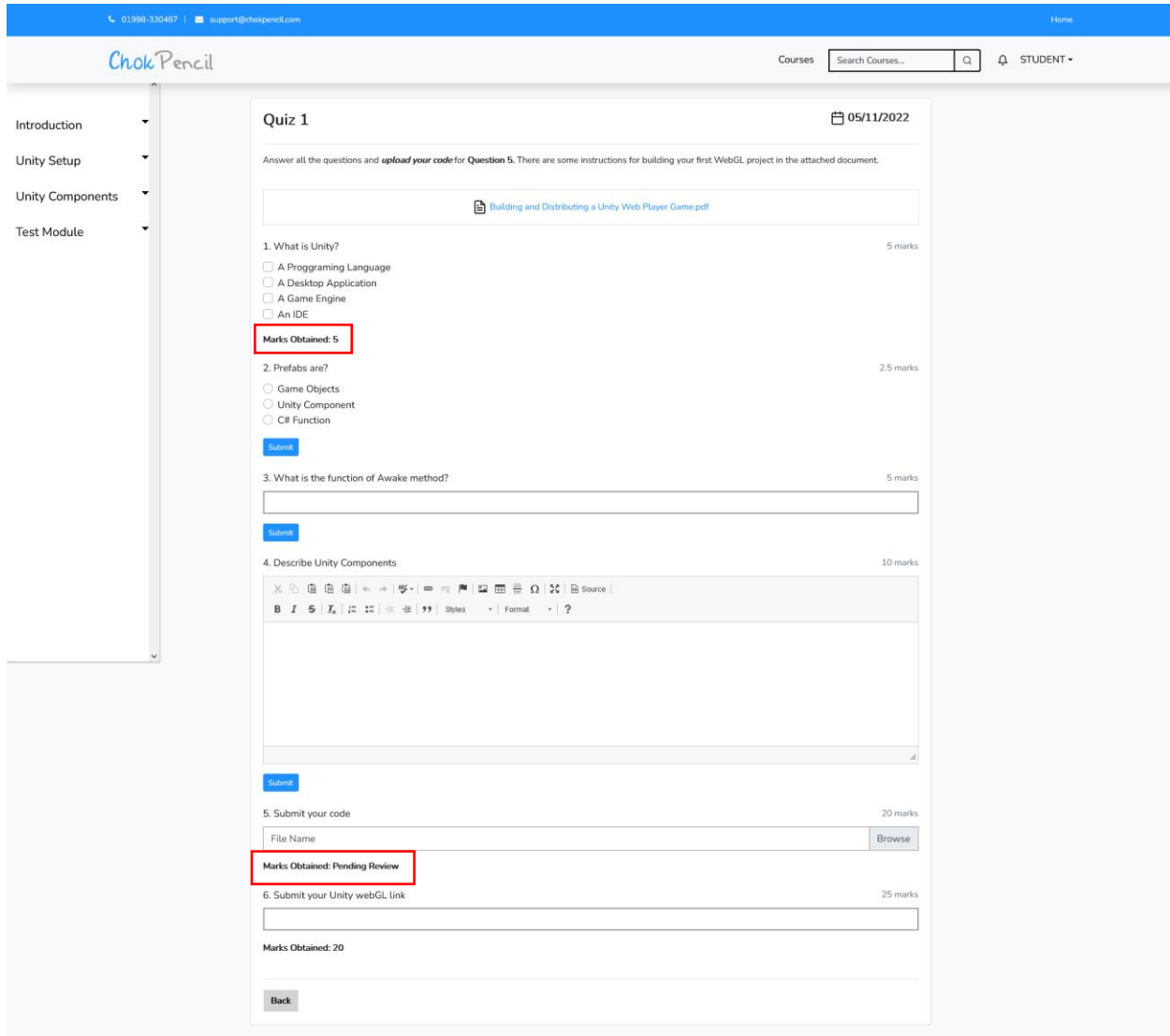


Figure 6.22.2: Responses Page

## 6.23 Get Obtained Marks:

Students can get find obtained marks on the assessment page under each question whenever the submission is graded. If it's not graded yet, student will see "Pending Review" instead.



The screenshot displays the ChokPencil assessment interface. At the top, there is a blue header with contact information (01999-330487, support@chokpencil.com) and a 'Home' link. Below the header, the 'ChokPencil' logo is on the left, and 'Courses' with a search bar and 'STUDENT' profile are on the right. A sidebar on the left lists navigation options: Introduction, Unity Setup, Unity Components, and Test Module. The main content area is titled 'Quiz 1' with a date of 05/11/2022. It contains several questions:

- Question 1: 'What is Unity?' (5 marks). Options: A Programming Language, A Desktop Application, A Game Engine, An IDE. The 'Marks Obtained: 5' is highlighted with a red box.
- Question 2: 'Prefabs are?' (2.5 marks). Options: Game Objects, Unity Component, C# Function. A 'Submit' button is visible.
- Question 3: 'What is the function of Awake method?' (5 marks). A text input field is present, with a 'Submit' button below it.
- Question 4: 'Describe Unity Components' (10 marks). Includes a rich text editor toolbar with options like Bold, Italic, Underline, and a 'Submit' button.
- Question 5: 'Submit your code' (20 marks). Includes a 'File Name' input field and a 'Browse' button. The 'Marks Obtained: Pending Review' is highlighted with a red box.
- Question 6: 'Submit your Unity WebGL link' (25 marks). Includes a text input field.

At the bottom of the quiz area, it shows 'Marks Obtained: 20' and a 'Back' button.

Figure 6.23.1: Obtained Marks on Assessment Page

## 6.24 Rate/Review Course:

Students enrolled into the course can rate and review course. Student needs to click “Function (gear icon)” button on upper right corner of Course Dashboard and select “Rate/Review” option.

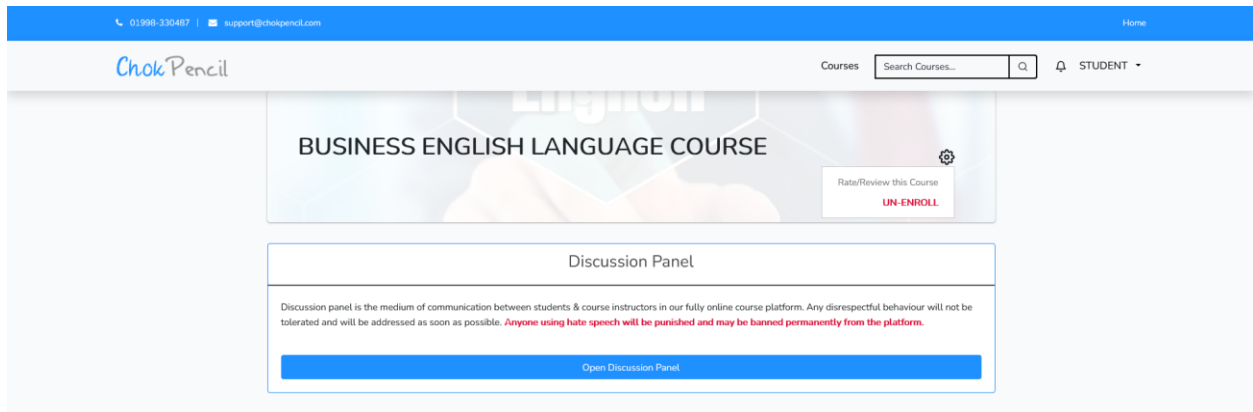


Figure 6.24.1: Rate/Review option on Course Dashboard

Selecting “Rate/Review” option will redirect to Rate/Review page. Student will give a rating based on 10 and can optionally write a review and submit. This ratings and reviews will be shown in course details.

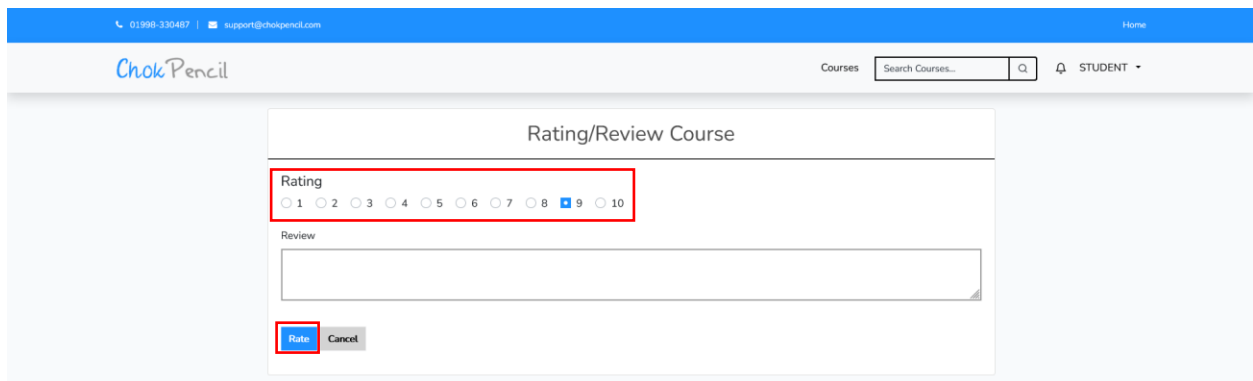


Figure 6.24.2: Rate/Review Page

## 6.25 Course Discussion Panel:

The screenshot shows the ChokPencil website interface. At the top, there is a blue header with contact information (01999-330487, support@chokpencil.com) and a 'Home' link. Below the header, the 'ChokPencil' logo is on the left, and 'Courses Create Course' with a search bar and 'INSTRUCTOR' dropdown is on the right. The main content area is titled 'Discussion Panel' and features a 'Filter' sidebar on the left and a 'Posts' list on the right. The 'Filter' sidebar is highlighted with a red border and contains the following categories: All Posts, General Discussion, Introduction (with sub-items: Welcome to the course, What is Unity and why Unity?), Unity Setup (with sub-items: Download Unity, Download Visual Studio, Unity Environment Setup, Written Guide), Unity Components (with sub-items: Scenes, Sprites, Prefabs), and Test Module. The 'Posts' list shows two entries: 'Welcome' (posted by INSTRUCTOR, 04:57pm • 22/04/2021) and 'Unity Setup Problem' (marked as solved, posted by INSTRUCTOR, 04:52pm • 22/04/2021). The 'Unity Setup Problem' post includes a warning about installing the correct version of Unity. Navigation buttons for 'Back' and 'New Post' are visible at the bottom of the post list. A footer at the bottom of the page reads 'Copyright © 2021 ChokPencil Educations. All Rights Reserved.'

Figure 6.25.1: Course Discussion Panel

On discussion panel posts are listed. Post title acts as the post page link. Posts can be filtered by the selecting a course content from the filter on the left side of the page.

## 6.26 Create Discussion Thread:

Users can post new thread on course discussion panel. User can access the discussion panel from the course dashboard.

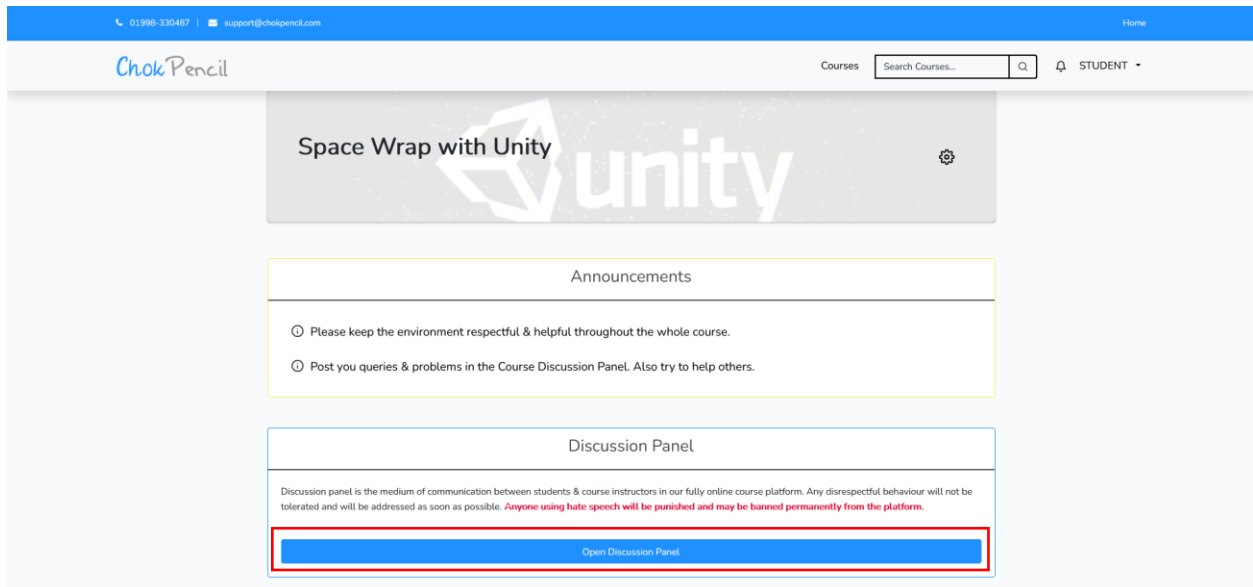


Figure 6.26.1: Discussion Panel Link on Course Dashboard

Clicking “Open Discussion Panel link” will redirect to the discussion panel. Clicking “New Post” button will open thread creation form.

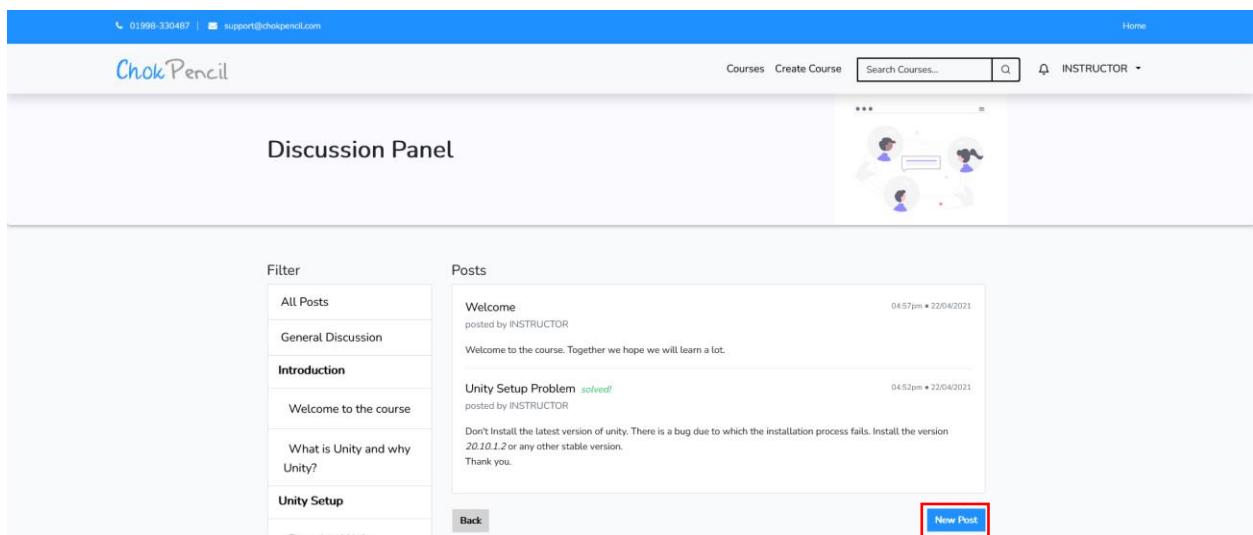
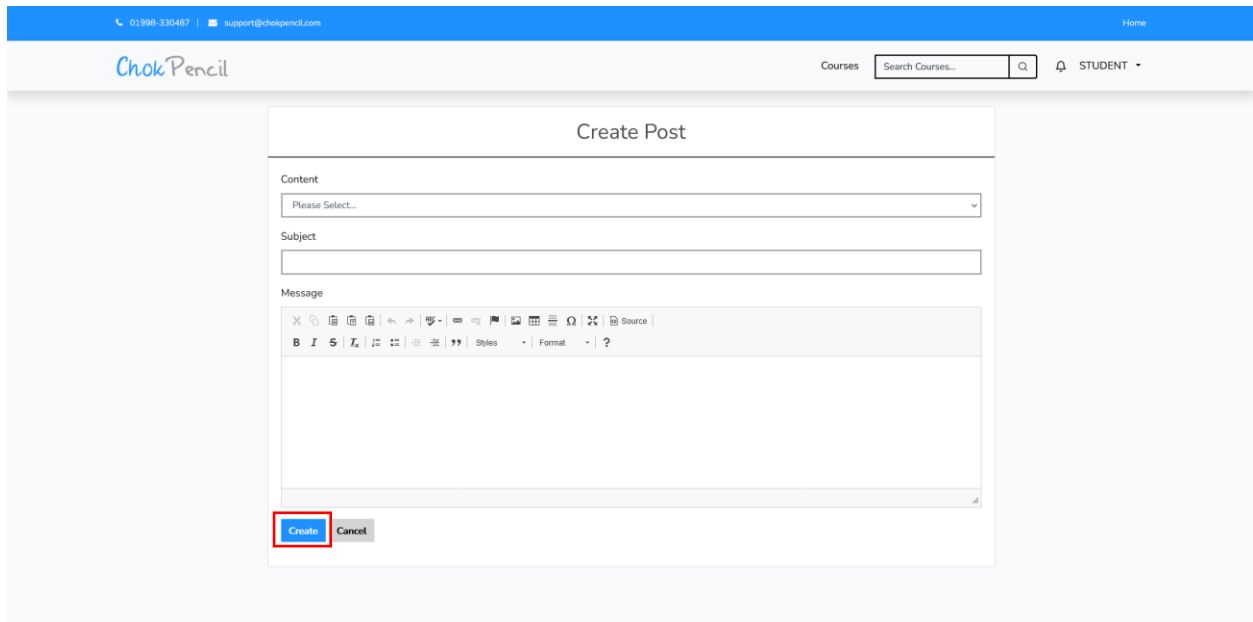


Figure 6.26.2: New Post Button on Discussion Panel

User will give details and submit. New thread will be posted.

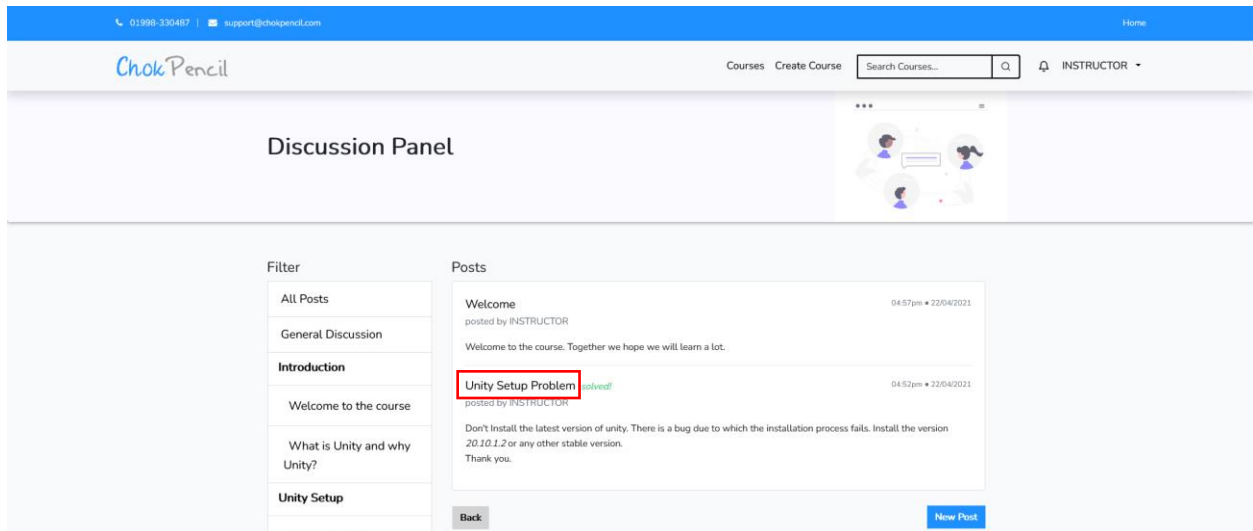


The screenshot shows the 'Create Post' form in the Chok Pencil interface. At the top, there is a blue header with contact information and a 'Home' link. Below the header, the 'Chok Pencil' logo is on the left, and 'Courses' with a search bar and a 'STUDENT' dropdown menu are on the right. The main content area is titled 'Create Post' and contains three input fields: 'Content' (with a dropdown menu), 'Subject', and 'Message'. The 'Message' field has a rich text editor toolbar with various icons and options like 'B', 'I', 'S', 'T', 'U', 'L', 'A', 'B', 'I', 'T', 'S', 'T', 'Y', 'S', 'T', 'Y', 'L', 'E', 'S', 'F', 'O', 'R', 'M', 'A', 'T', and '?'. At the bottom of the form, there are two buttons: 'Create' (highlighted with a red box) and 'Cancel'.

Figure 6.26.3: Thread Creation Form

## 6.27 Reply to Discussion Thread:

To post a reply to a discussion thread, first visit the post page by clicking post title from discussion panel.



The screenshot shows the 'Discussion Panel' in the Chok Pencil interface. At the top, there is a blue header with contact information and a 'Home' link. Below the header, the 'Chok Pencil' logo is on the left, and 'Courses' with a 'Create Course' link, a search bar, and an 'INSTRUCTOR' dropdown menu are on the right. The main content area is titled 'Discussion Panel' and features a 'Filter' sidebar on the left and a 'Posts' list on the right. The 'Filter' sidebar has several categories: 'All Posts', 'General Discussion', 'Introduction', 'Welcome to the course', 'What is Unity and why Unity?', 'Unity Setup', and 'Download Unity'. The 'Introduction' filter is selected. The 'Posts' list shows two posts. The first post is titled 'Welcome' and is posted by 'INSTRUCTOR'. The second post is titled 'Unity Setup Problem' and is also posted by 'INSTRUCTOR'. The 'Unity Setup Problem' post title is highlighted with a red box. The post content reads: 'Don't install the latest version of unity. There is a bug due to which the installation process fails. Install the version 20.10.1.2 or any other stable version. Thank you.' At the bottom of the post list, there are 'Back' and 'New Post' buttons.

Figure 6.27.1: A Post Link on Discussion Panel

Clicking the post title will redirect to the Post page.

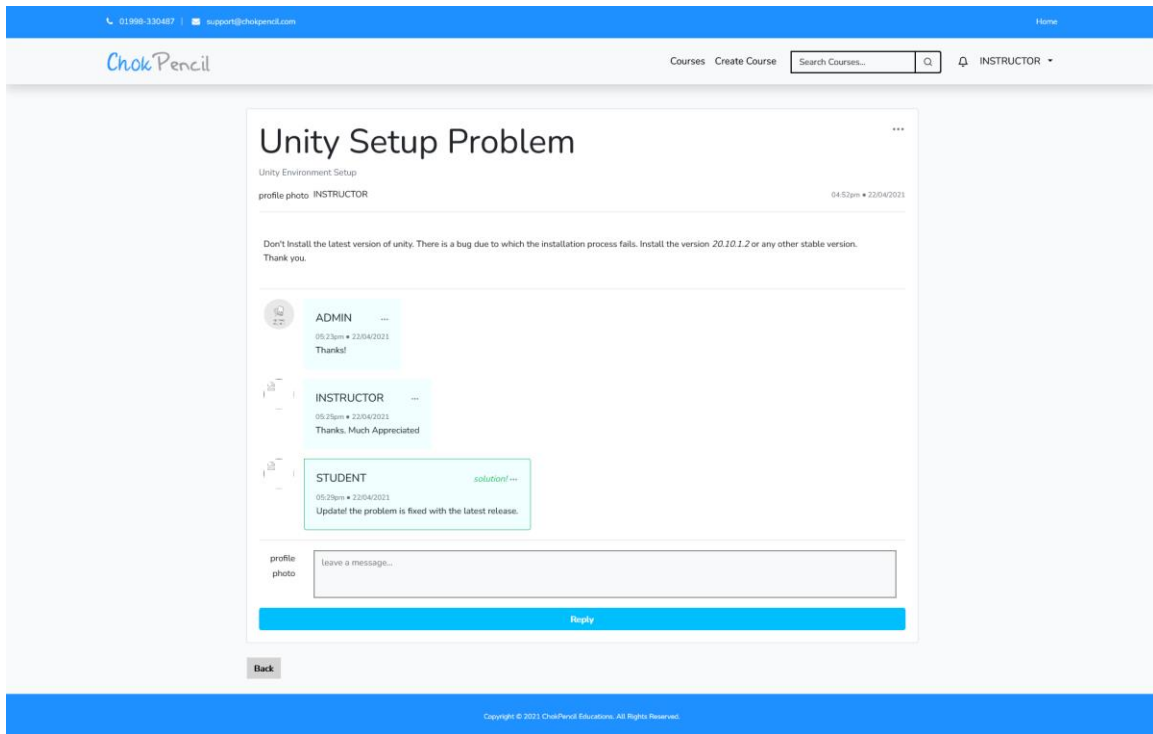


Figure 6.27.2: Discussion Panel Post

Type your message and click “Reply” button to post the reply.

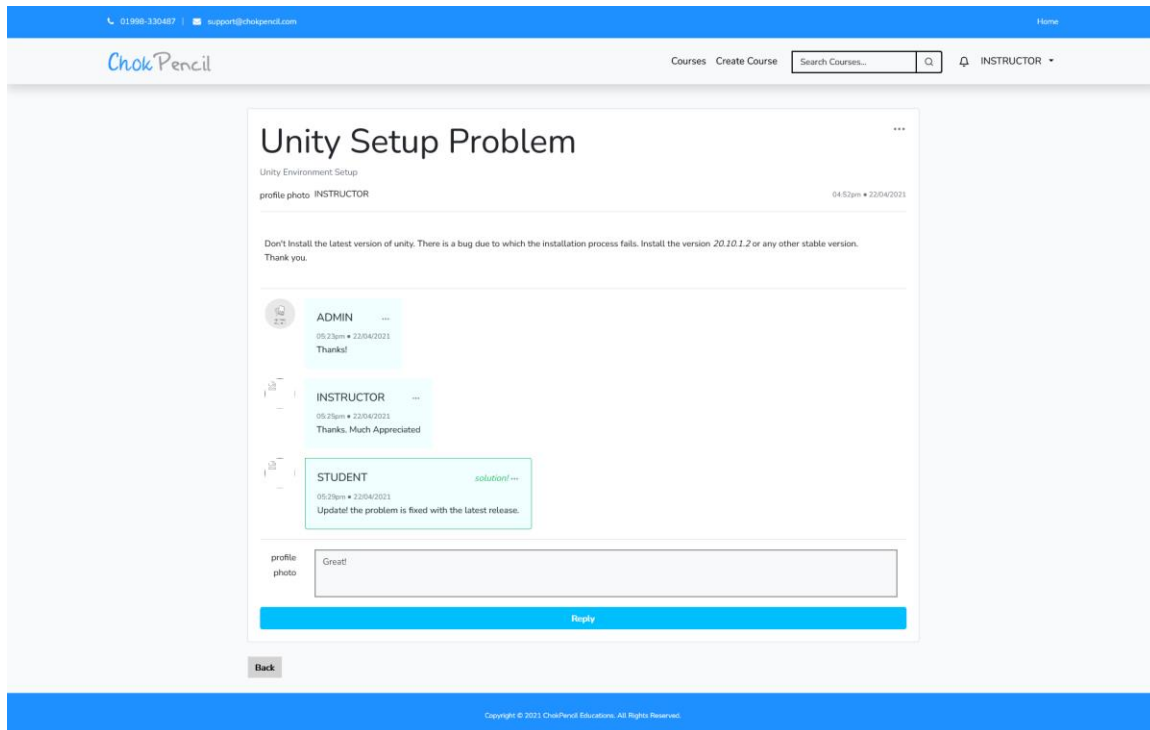


Figure 6.27.3: Reply to Discussion Thread

## 6.28 Mark Reply as Solution:

The original post owner can select a reply to the post as solution. First visit the post page.

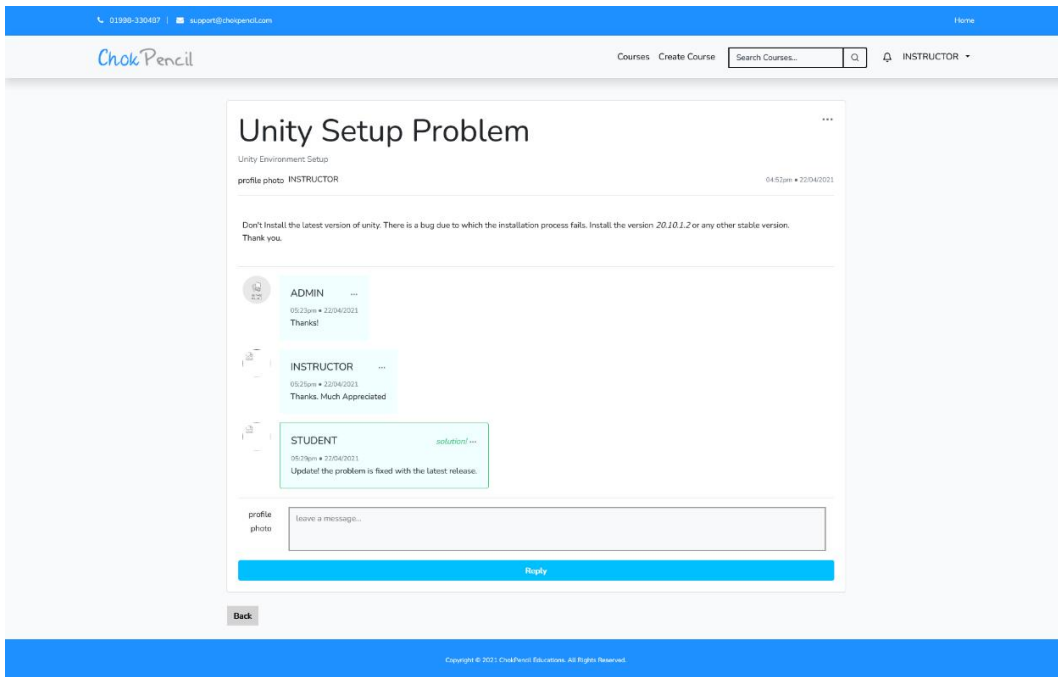


Figure 6.28.1: Discussion Panel Post

Then open the dropdown by clicking the “3 Dots” icon on the desired reply and select “Mark as Solution” option.

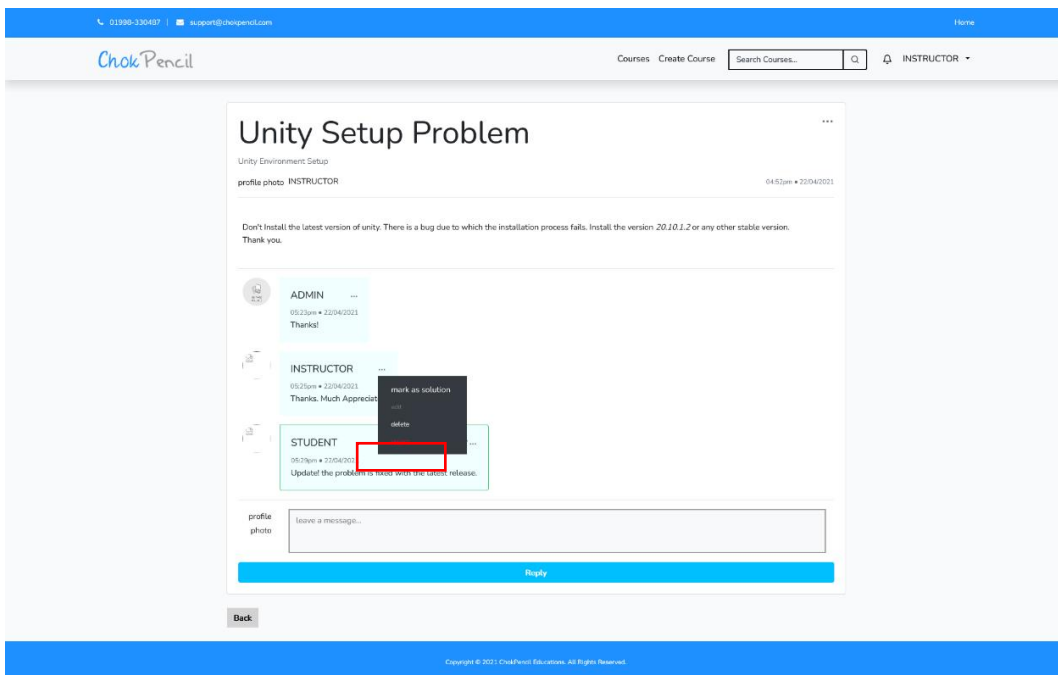


Figure 6.28.2: Mark as Solution Option on a Reply



## 6.29 Un-Enroll Course:

Students can un-enroll course anytime if they want to. To do that, student needs to click “Function (gear icon)” button on upper right corner of course dashboard and select “Rate/Review” option and then select “UN-ENROLL” option.

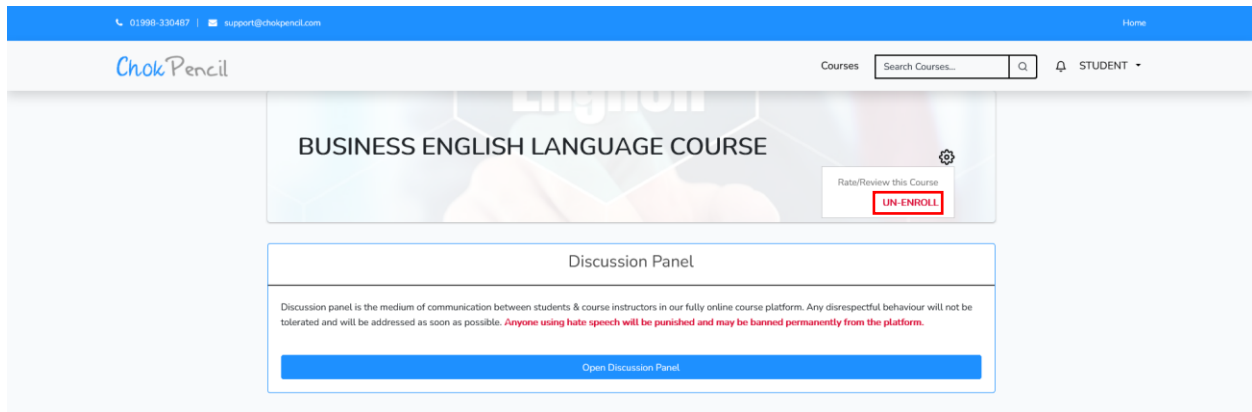


Figure 6.29.1: Un-Enroll option on Course Dashboard

Selecting “Un-Enroll” option will trigger a confirmation modal. If student clicks “Confirm” button on the modal un-enrollment process will be completed.

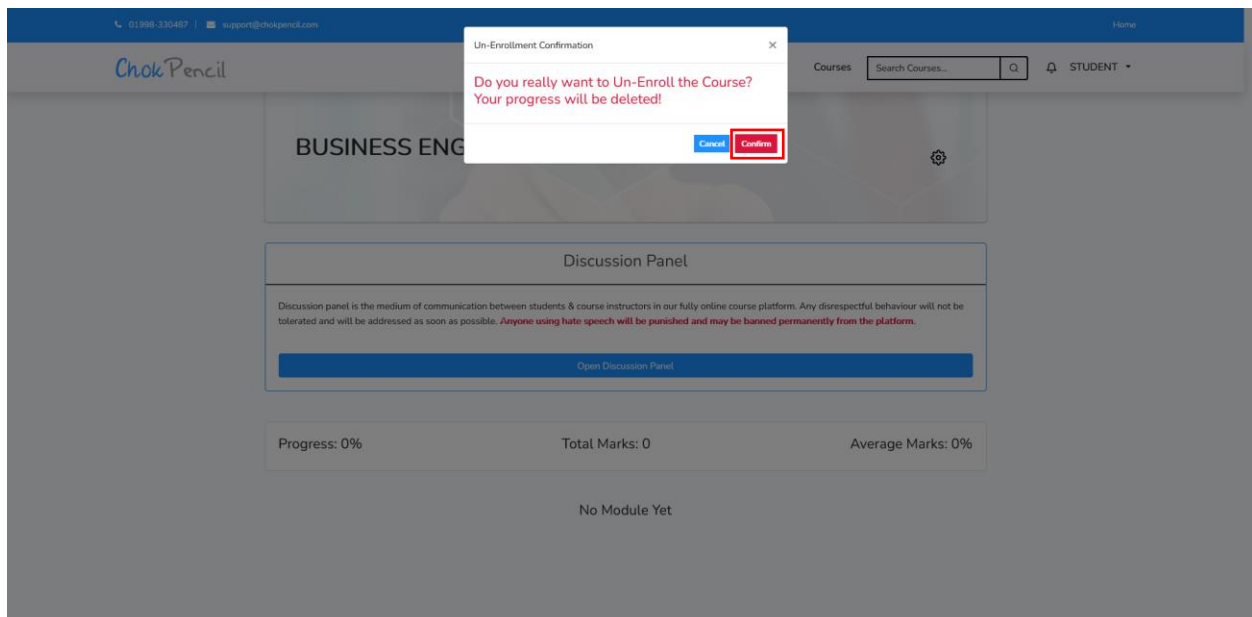


Figure 6.29.2: Un-Enrollment Confirmation Modal

## 6.30 Leave Course:

Instructors can leave a course if there is at least another instructor who owns the course. To do that, instructor needs to click “Function (gear icon)” button on upper right corner of course dashboard and select “Leave Course” option.

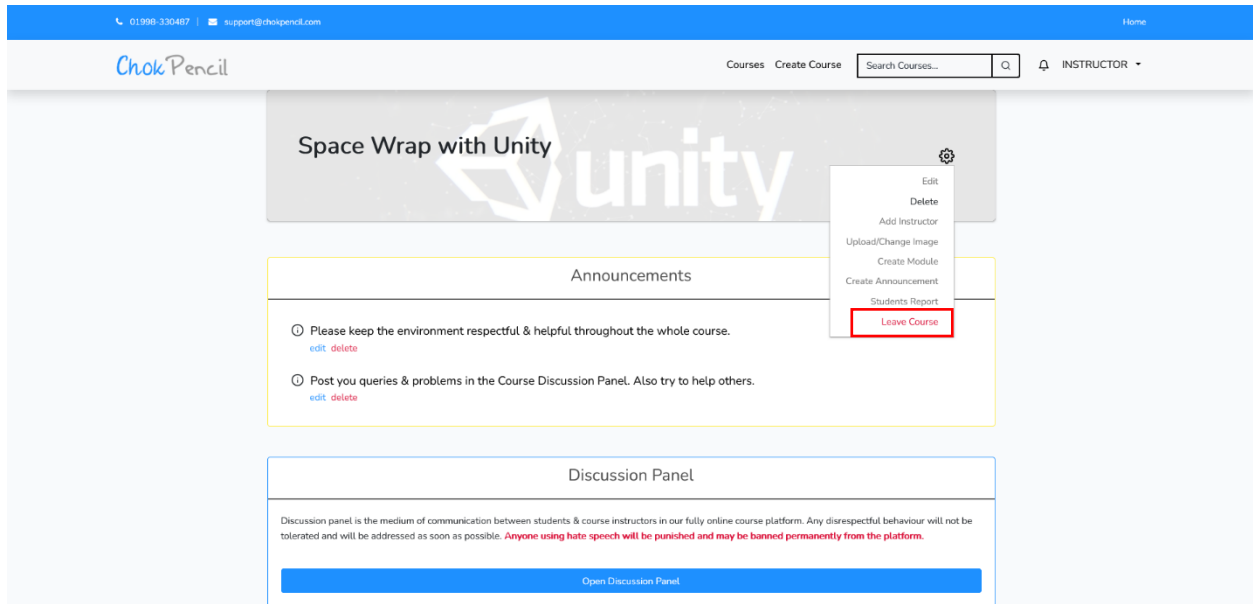


Figure 6.30.1: Functions on Course Dashboard (instructor view)

Selecting “Leave Course” option will trigger a confirmation modal. If instructor clicks “Confirm” button on the modal, he/she will leave the course.

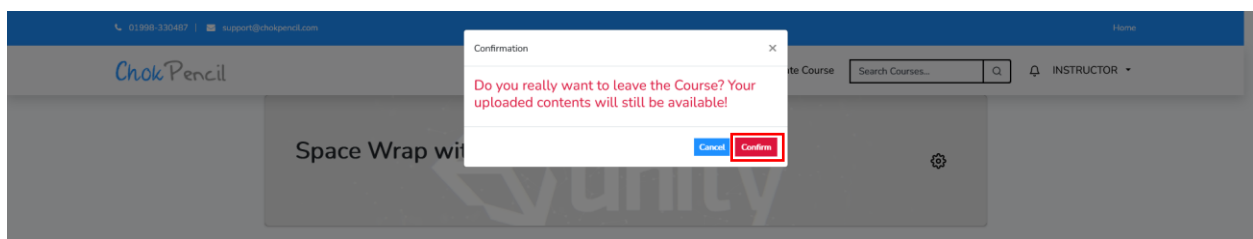


Figure 6.30.2: Leave Course Confirmation Modal

## 6.31 Admin Dashboard:

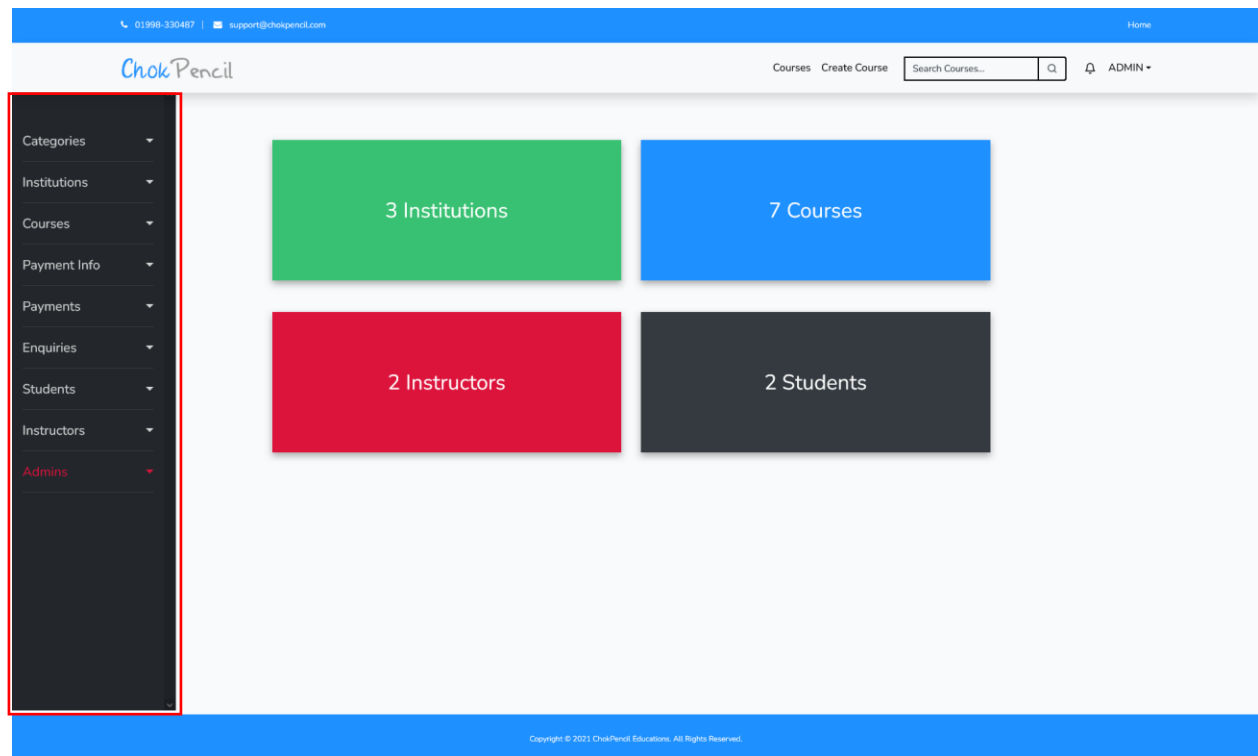


Figure 6.31.1: Admin Dashboard

Main functionalities can be accessed by the menus in sidebar located left side of the page.

## 6.32 Verify Payment:

Admins will verify payments completed by students. First, they will access payment index page by selecting “Payments” Menu from sidebar in dashboard.

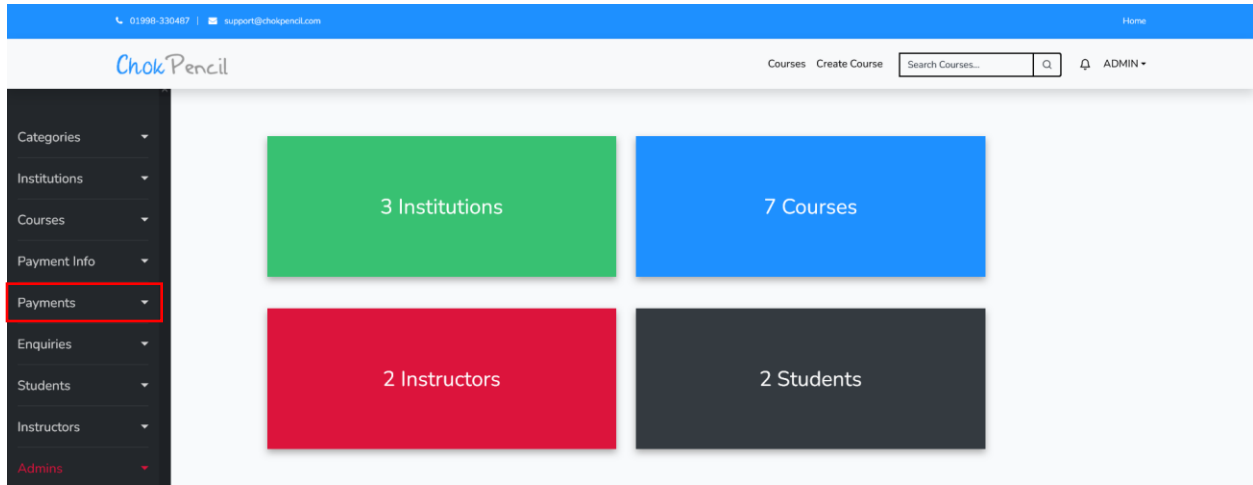


Figure 6.32.1: Payments Menu on Sidebar

Click “Verify” button on the row of a payment on “Payments” table to verify.

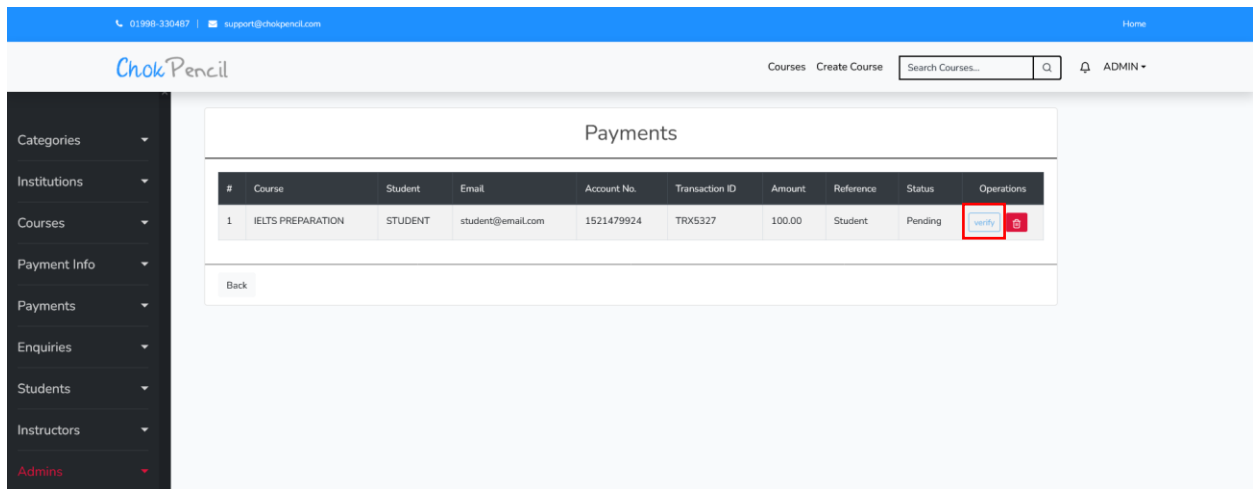


Figure 6.32.2: Payment Index Page

### 6.33 Verify Instructor:

Admins will verify new instructor accounts. First, they will access instructor index page by selecting “Instructors” menu from sidebar in dashboard.

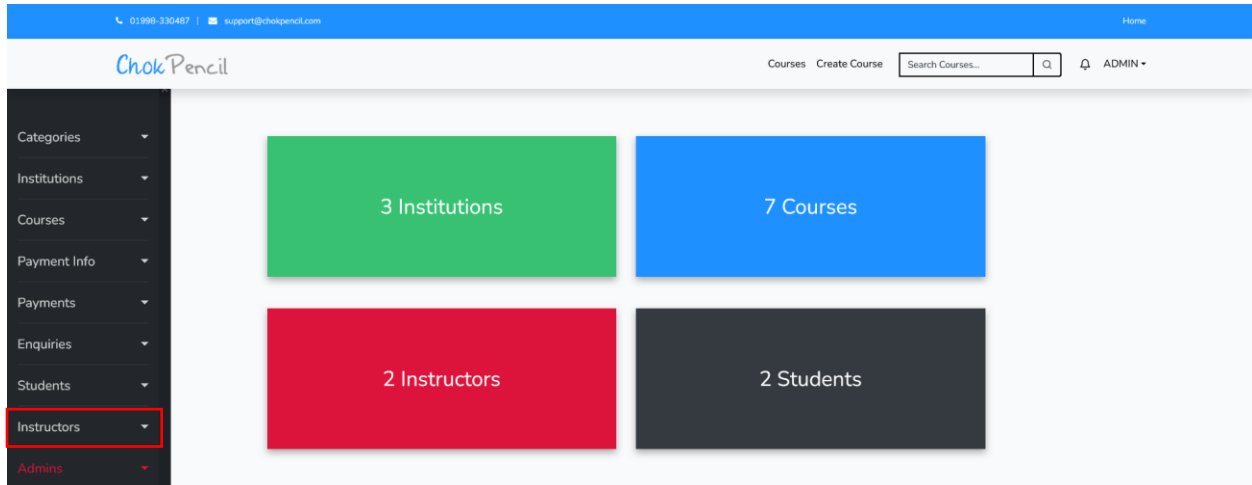


Figure 6.33.1: Instructors Menu on Sidebar

Click “Details button (eye icon)” on the row of an instructor on “Instructors” table.

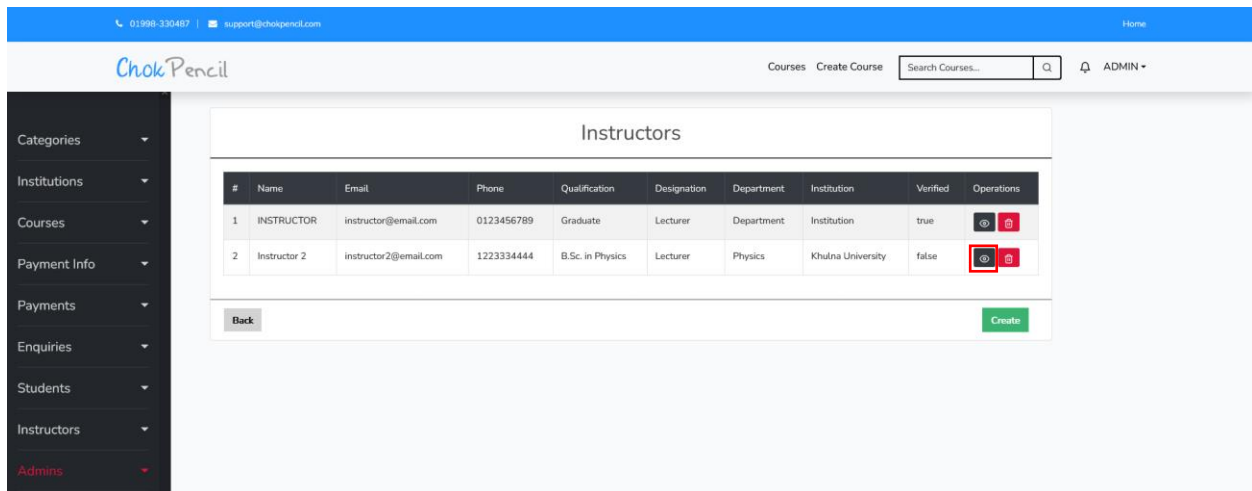


Figure 6.33.2: Instructor Index Page

Click “Verify” button on the instructor profile.

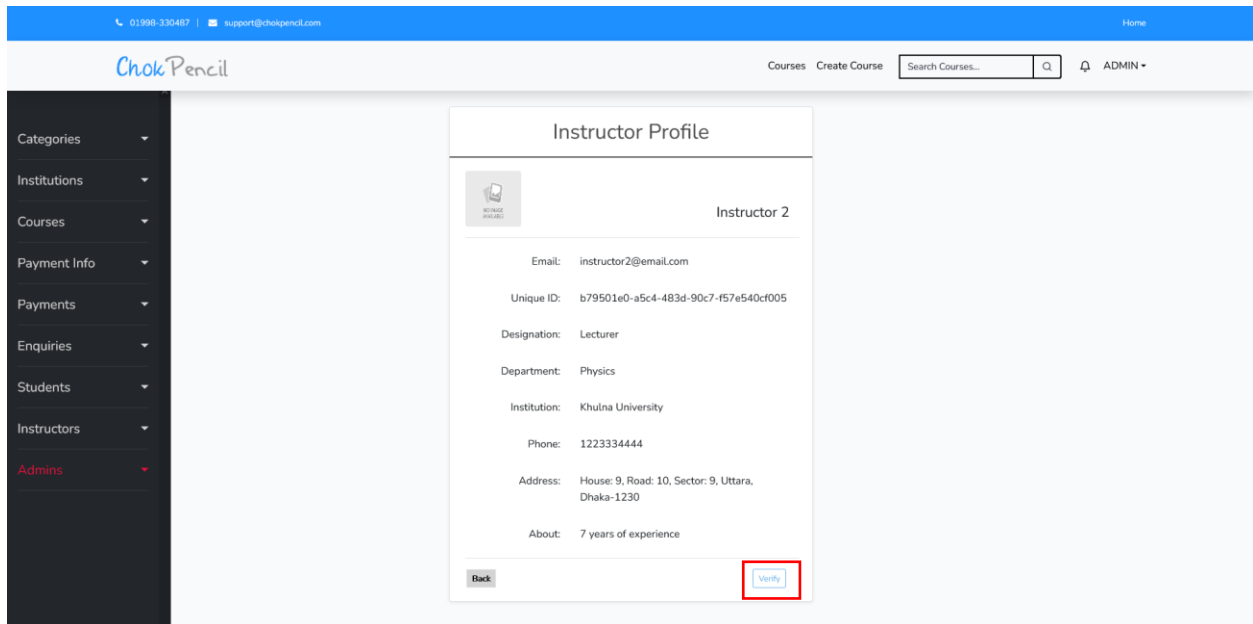


Figure 6.33.3: Instructor Profile

## 6.34 Create Category:

Admins can create new course categories. First, they will access category index page by selecting “Categories” menu from sidebar in dashboard.

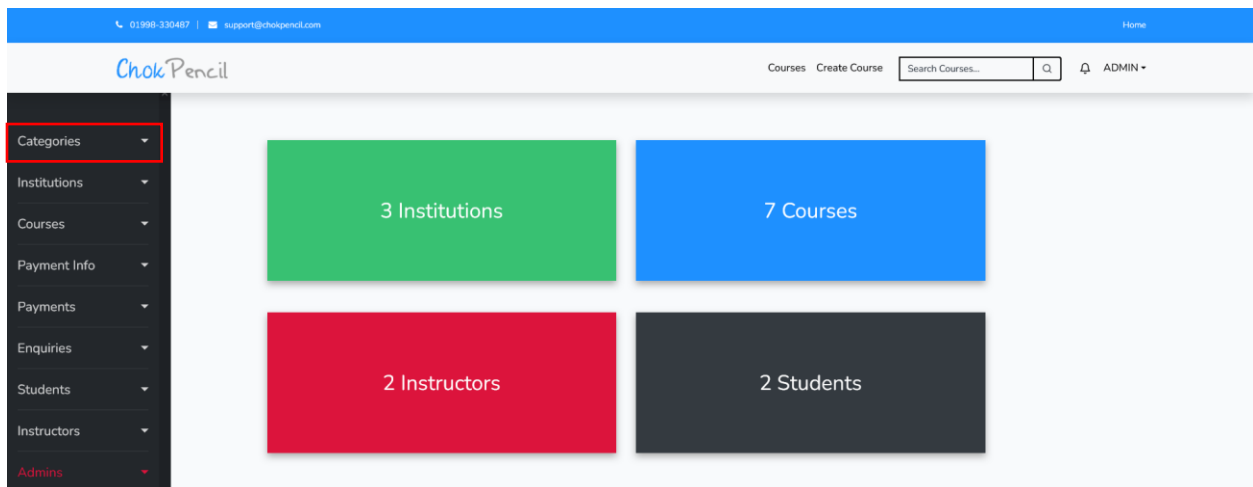


Figure 6.34.1: Categories Menu on Sidebar

Click “Create” button on the category index page.

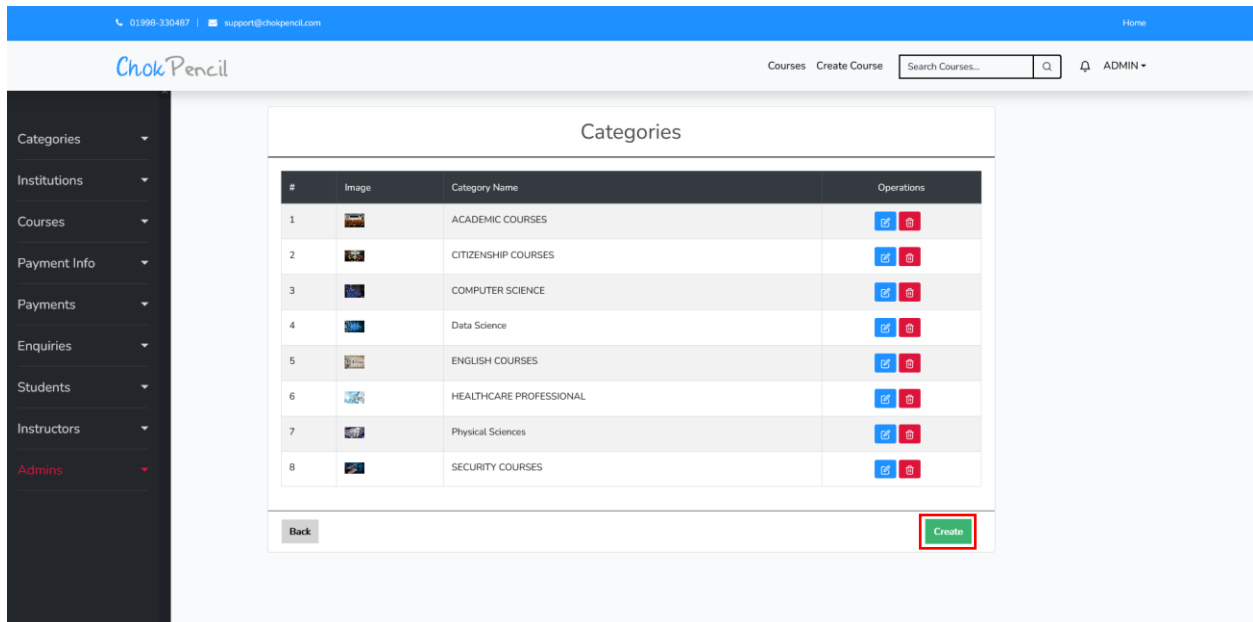


Figure 6.34.2: Category Index Page

On the category creation form give category name and image and submit the form. A new category will be created.

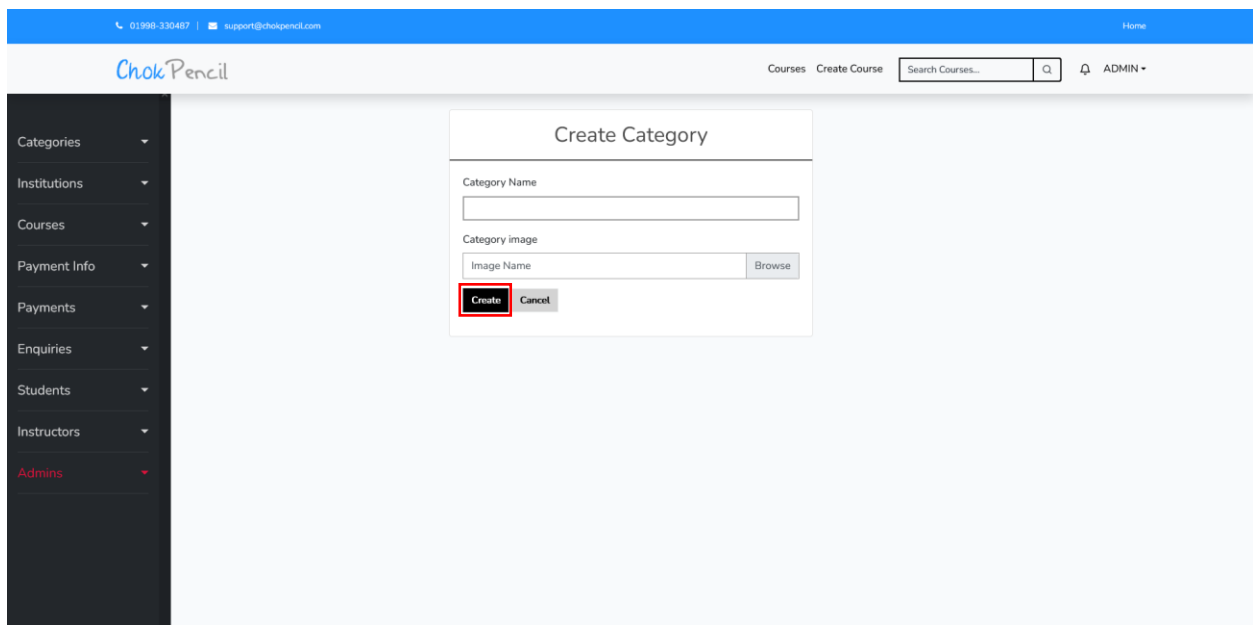


Figure 6.34.1: Category Creation Form

## 6.35 Create Institution:

Admins can create new institutions. First, they will access institution index page by selecting “Institutions” menu from sidebar in dashboard.

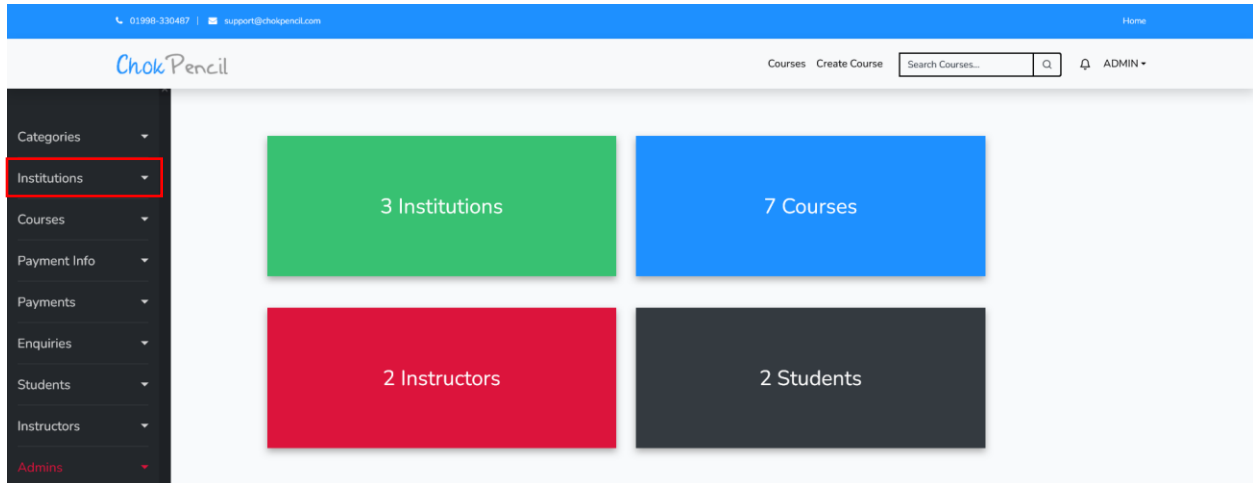


Figure 6.35.1: Institutions Menu on Sidebar

Click “Create” button on the institution index page.

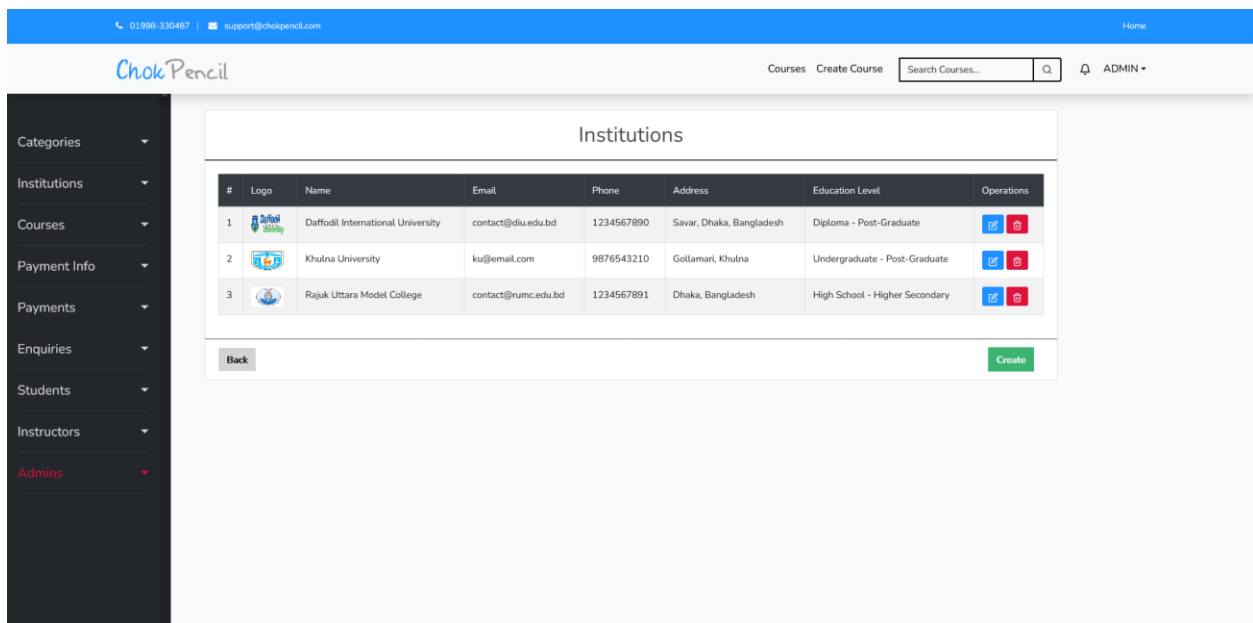


Figure 6.35.2: Institution Index Page



On the institution creation form give category name and image and submit the form. A new institution will be created.

The screenshot shows the 'Create Institution' form in the Chok Pencil system. The form is titled 'Create Institution' and is located in the center of the page. It contains the following fields and options:

- Name: A text input field.
- Email: A text input field.
- Phone: A text input field.
- Address: A text input field.
- Education Level: Two dropdown menus labeled 'From' and 'To', both with 'Please Select...' as the placeholder text.
- Upload Logo: A text input field for 'File Name' and a 'Browse' button.
- Buttons: A red-bordered 'Create' button and a 'Cancel' button.

The left sidebar contains a menu with the following items: Categories, Institutions, Courses, Payment Info, Payments, Enquiries, Students, Instructors, and Admins (highlighted in red).

Figure 6.35.3: Institution Creation Form

## 6.36 Assign Course to Institution:

Admins can assign a course to an institution. First, they will visit the course details page and click the “Function (gear icon)” button to open available options. Select “Assign Institution” option.

The screenshot shows the 'Assign Institution' option on the Course Details Page. The page is titled 'BACHELOR IN BUSINESS MANAGEMENT' and is located in the center of the page. It contains the following information and options:

- Course Title: BACHELOR IN BUSINESS MANAGEMENT
- Description: Equivalent to Final year of Bachelor's degree
- Ratings: 0.00/10 on 0 ratings
- Buttons: A blue 'RESUME' button and a '0 students currently enrolled' indicator.
- Dropdown Menu: A gear icon button that opens a menu with the following options: Course Modules, Edit, Delete, Add Instructor, Upload/Change Image, Assign Institution (highlighted in red), and Enroll Students.

The left sidebar contains a menu with the following items: Categories, Institutions, Courses, Payment Info, and Payments.

Figure 6.36.1: Assign Institution Option on Course Details Page

On the assign institution form, select an institution. The course will be assigned to the selected institution.

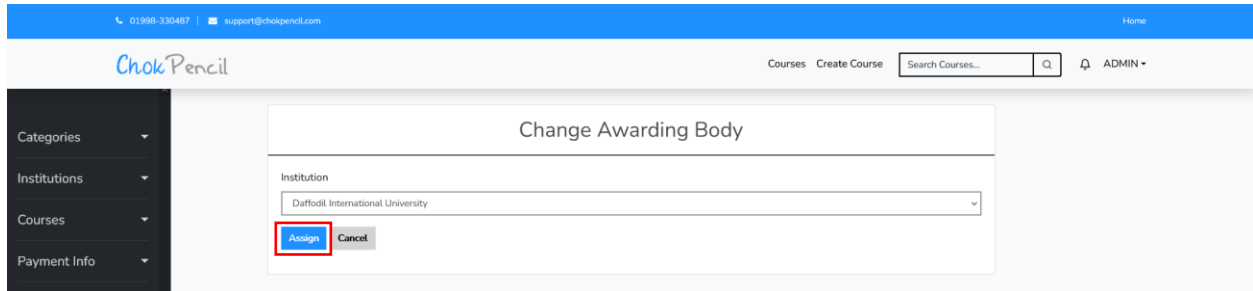


Figure 6.36.2: Assign Institution Form

### 6.37 Notifications:

Clicking the “Bell” icon on header will show unread notifications as dropdown. The count of unread notifications will be shown as badge with the icon.

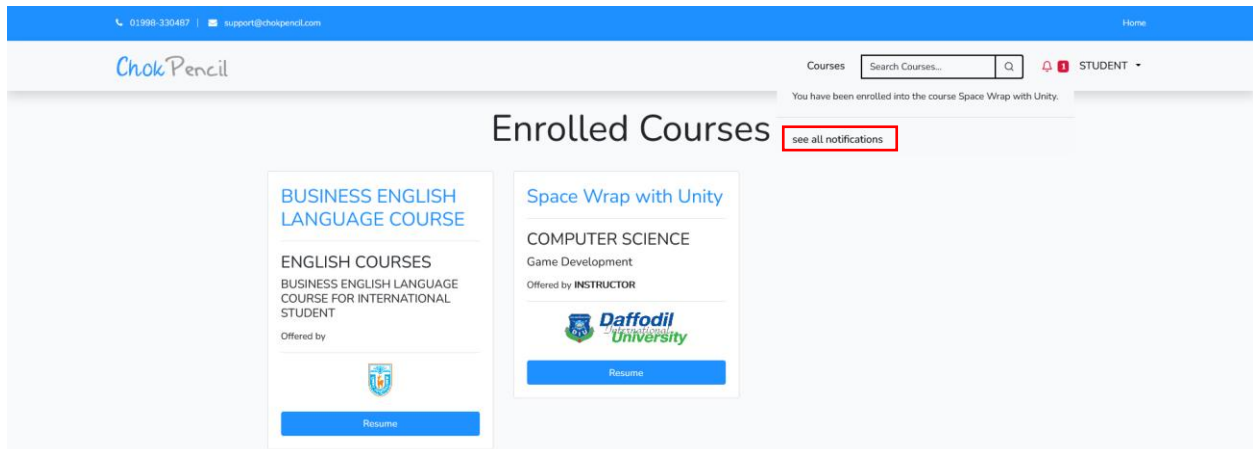


Figure 6.37.1: Unread Notifications

To see all notifications, click the “see all notifications” option

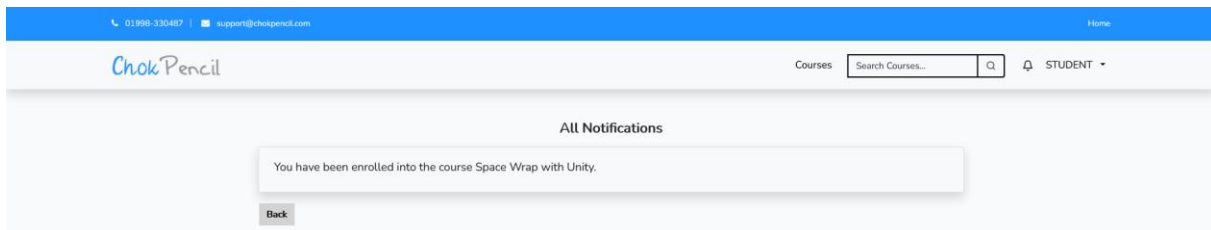


Figure 6.37.2: All Notifications

## 6.38 Mails:

An email will be sent to the student with payment information when his/her payment has been received.

**Chok Pencil**

**Payment Received**

Dear STUDENT,

Your payment for **Space Wrap with Unity** has been received successfully. You can access the Course Contents as soon as the payment is **confirmed**. Please keep patience until then. You will be notified upon payment confirmation.

**Payment Details:**

Category	Value
Payment ID	#2
Method	BKash
Account No.	1998330487
Amount	500
Transaction ID	TRXED5620
Reference	masud

You can edit the payment information only *once* in case you made mistake.

[Edit Payment Information](#)

Thanks,  
Chok Pencil

© 2021 Chok Pencil. All rights reserved.

Figure 6.38.1: Payment Received Mail

An email will be sent to the student with the course dashboard link when his/her payment has been verified.

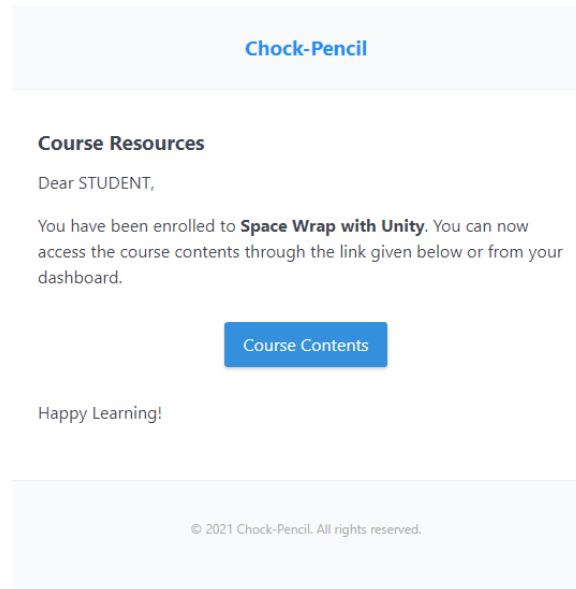


Figure 6.38.2: Payment Verification Mail

An email will be sent to the instructor when his/her account gets verified with course creation link.

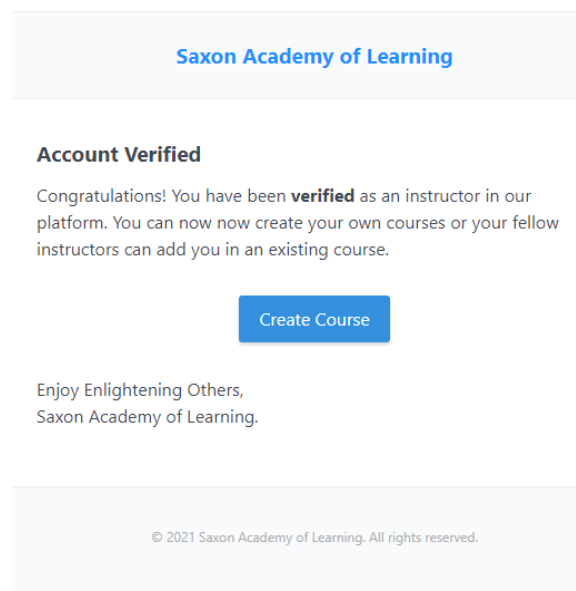


Figure 6.38.3: Account Verification Mail

# Chapter 7: Conclusion

This chapter talks about the challenges has been aroused during the development of the system and how they have been overcome. It also describes the limitations and future scope of this project and finally enlists the online repository link where the code of the system can be accessed.

## 7.1 Challenges and Achievements:

During the development of the project, challenges has been faced in every steps. Being a beginner with web application development, the author lacked professionalism. So, where an expert would implement a feature in first attempt, the author needed multiple attempts and corrections specially at the beginning. Moreover, for the COVID-19 pandemic it was even more difficult consult an expert. But finally, the experience gathered throughout the process is unimaginable.

Although the author had some skill with PHP, Laravel Framework was quite new to him. The author had to learn the basics of this technology by trying and implementing within the project schedule. As the project is vast the time allocation and human resource were very limited.

Integrating APIs of other services was another challenge with no prior experience. Some features were very complicated so integrating APIs of pre-existing systems was the only choice to finish the project within scheduled time.

Another challenge was to test this large system and ensure everything is functional. The testing phase was more challenging and time consuming than expected.

Despite facing many challenges, the project was implemented and functional within the allocated time which is a great achievement for the author.

## 7.2 Limitations:

For the time constrained and very limited human resource some non-functional requirements can not be implemented in this version of the application but can easily be implemented in a future build without breaking any existing feature. As the project is well documented and coding has been done following conventions, anyone willing to add features to the system can do so without any difficulties.

Again, despite having extreme willingness, the author could not implement the plagiarism checking functionality as a free API for the service could not be found. As the time was limited and developing this functionality manually is quite complicated and requires more expertise it could not also be achieved.

### 7.3 Future Scope:

The target of the project was to develop a full package of e-learning system. With the advancement of technology, the concept itself is growing day by day. So, there is a scope of adding vast more features to the system. Some of them are listed below:

- Advanced searching system implementation for courses
- Adding full Bangla interface
- Anti-Plagiarism techniques implementation for assessments submission
- Time limitation for assessments after student starts it
- Shuffling questions of an assessment so that the order of question arrangements appears different to each student
- Peer grading functionality for assessments
- Integrating Unity simulations for laboratory experiments
- Developing Mobile Application

### 7.4 Conclusion:

Lack of enough resources, unequal development, underdeveloped technology infrastructure all these factors hinder quality education in our country. Day by day we are falling behind in international scenario which impacting both further development and financial sectors due to unskilled man power. Covid-19 pandemic has worsened the situation. A good online education platform can solve these issues easily adding flexibility and availability in education system. Using the system Students and Instructors and even Educational Institutions all over the country can be benefitted.

### 7.5 Useful Links:

- GitHub Repository: <https://github.com/Kamrul-Haque/chokpencil.git>
- Live Demo: <https://www.chokpencil.com/>

# REFERENCES

1. PHP Documentation: <https://www.php.net/manual/en/>
2. Laravel Documentation: <https://laravel.com/docs/6.x/>
3. Bootstrap Documentation: <https://getbootstrap.com/docs/4.5/getting-started/introduction/>
4. MySQL Documentation: <https://dev.mysql.com/doc/refman/8.0/en/>
5. jQuery Documentation: <https://api.jquery.com/>
6. Laracast Laravel Forum and Tutorial: <https://laracasts.com/>
7. W3Schools MySQL Tutorial: <https://www.w3schools.com/mysql/default.asp>
8. W3Schools PHP Tutorial: <https://www.w3schools.com/php/default.asp>
9. W3Schools jQuery Tutorial: <https://www.w3schools.com/jquery/default.asp>

## Turnitin Originality Report

Processed on: 26-Jan-2022 10:29 +06  
 ID: 1748353957  
 Word Count: 13469  
 Submitted: 1

173-35-255 By Md. Kamrul Haque

Similarity Index

6%

### Similarity by Source

Internet Sources: 4%  
 Publications: 0%  
 Student Papers: 3%

1% match (Internet from 05-Jan-2022)

<http://dspace.daffodilvarsity.edu.bd:8080/bitstream/handle/123456789/5681/171-35-1817%20%2823%20.pdf?isAllowed=y&sequence=1>

1% match (Internet from 09-Apr-2010)

[http://cit3.cdn.swin.edu.au/majorprojects\\_2005/softfive/deliverables/requirements\\_model\\_v1.2.pdf](http://cit3.cdn.swin.edu.au/majorprojects_2005/softfive/deliverables/requirements_model_v1.2.pdf)

1% match (student papers from 08-Mar-2015)

[Submitted to Universiti Tunku Abdul Rahman on 2015-03-08](#)

< 1% match (student papers from 07-Apr-2021)

[Submitted to Universiti Tunku Abdul Rahman on 2021-04-07](#)

< 1% match (student papers from 30-Aug-2021)

[Submitted to Universiti Tunku Abdul Rahman on 2021-08-30](#)

< 1% match (student papers from 25-Jan-2010)

[Submitted to School of Accounting & Management on 2010-01-25](#)

< 1% match (Internet from 13-Dec-2020)

<https://docs.unity3d.com/Manual/CreatingScenes.html>

< 1% match (Internet from 17-Oct-2021)

<https://kmea.karnataka.gov.in/storage/pdf-files/Reports%20and%20other%20docs/Evaluation%20of%20the%20Aarogya%20Bandhu%20Scheme.pdf>

< 1% match (student papers from 30-Apr-2020)

[Submitted to University of Ulster on 2020-04-30](#)

< 1% match (Internet from 03-Aug-2020)

[https://mafiadoc.com/condition-based-maintenance\\_5bb0681f097c4705398b47a9.html](https://mafiadoc.com/condition-based-maintenance_5bb0681f097c4705398b47a9.html)

< 1% match (student papers from 11-May-2015)

[Submitted to School of Business & Computer Science Limited on 2015-05-11](#)

< 1% match (student papers from 02-Apr-2019)

[Submitted to Daffodil International University on 2019-04-02](#)

< 1% match (student papers from 15-Aug-2017)

[Submitted to Laureate Education Inc. on 2017-08-15](#)

< 1% match (Internet from 01-Jan-2022)

<https://www.independent.co.uk/news/world/americas/gavin-newsom-california-los-angeles-sacramento-legislature-b1978429.html>

< 1% match (Internet from 16-Jul-2021)

[https://elib.dlr.de/142079/1/Rohit\\_BA\\_Thesis.pdf](https://elib.dlr.de/142079/1/Rohit_BA_Thesis.pdf)