

E-LEARNING PLATFORM

A PROJECT REPORT

Submitted By

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**Submitted in partial fulfillment of the
Requirements for the Degree of**

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**Under the Supervision of
Dr. Arun Kr. Tripathi
Professor**



Submitted to

**DEPARTMENT OF COMPUTER APPLICATIONS
KIET Group of Institutions, Ghaziabad**

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(JAN 2022)

CERTIFICATE

Certified that **Kajal Punia (Enrolment No-200029014005740), Niharika Baliyan (Enrolment No-200029014005743), Aparna Singh(Enrolment No-200029014005710)** have carried out the project work having “**Title of Report ELP**” for Master of Computer Applications from Dr. A.P.J. Abdul Kalam Technical University (AKTU) (formerly UPTU), Technical University, Lucknow under my supervision. The project report embodies original work, and studies are carried out by the student himself /herself and the contents of the project report do not form the basis for the award of any other degree to the candidate or to anybody else from this or any other University/Institution.

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Date:

13/01/2022

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ABSTRACT

E-learning fulfills the thirst of knowledge and offers online content that can be delivered for the learner at anywhere and anytime through a wide range of e-learning solutions while compared with traditional learning systems. It also provides rapid access to specific knowledge and information. With the rapid growth of voluminous information sources and the time constraint the learning methodology has changed. Learners obtain knowledge through e-Learning systems rather than manually teaching and learning.

Through this project we intend to provide an e-learning platform where instructors can create courses and students can enroll themselves in various courses and learn without any boundations. ELP aims to provide education anytime, anywhere and for everyone. It provides added functionality to choose between text or video content.

ELP is designed while keeping in mind the main requirement of the college students-MOOC courses. Now, instead of looking for courses here and there, students can just enroll themselves in the courses designed by their own trusted faculty members, that too free of cost.

ACKNOWLEDGEMENTS

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Kajal Punia

Niharika Baliyan

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List of Abbreviations

Abbreviation	Full form
ELP	e-Learning Platform
e-learning	Electronic Learning
UC	Use Case
Approx.	Approximation

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1. INTRODUCTION

The ELP has been developed to overcome the challenges of manual learning and teaching system also to promote independent learning. This platform is to reduce hardships faced by existing systems and is designed for the particular need of a college to use the functionalities or operations in a smooth manner.

This platform is easy to use for instructors and students i.e. no formal knowledge is needed to use the platform thus by this all it proves it is user-friendly. This platform reduces errors while entering the data by providing error messages as a user enters invalid data. ELP can lead to secure, fast and error free system. It will help a college to manage or utilize resources and time. This platform allows students to study at their own place. Students can view the course from this platform and instructor can upload and update the course.

This ELP is a space or portal filled with educational content for those courses which are offered by the affiliated university.

1.1 Project description

ELP lets users register with valid email and login with the registered email id. There are two types of users here i.e., Student and Instructor. By default all the users are students, the role of instructor is given at the backend manually. Students can view the courses, enroll in them and then study. Instructors can create courses, add lessons, edit content, view the number of enrolled students and enroll in different courses. ELP transcends the traditional classroom learning to e-learning and makes it available to the students anywhere anytime. With the help of ELP, the MOOC courses will be simplified as well, now students can just enroll in the courses created by their own faculty members and gain extra knowledge. It will also facilitate the faculty members to wrap up their study materials in one place and make it available to the students.

1.2 Project Scope

The scope of the system is to have a high-tech environment. That means by using the e-learning platform, the users can learn new subjects by enrolling into the various courses. This system will add some features in their learning environment that can make their study interesting. That will help the community use the technology in effective ways:

1. Can have all the courses at one place.
2. Self paced study.
3. Manage and organize the course content easily.

1.3 Project Definition

Definitions:

User:

- i. User is supposed to login using its ID and Password. This will allow only a single user to login from a particular device.
- ii. When a user forgets his/her password then he/she can generate a code on his/her email using it the new password can be generated.
- iii. A user can enroll into different courses and study .
- iv. A user can logout from the website whenever done with the study.

Instructor:

- i. The Instructor can create the course, edit the course and publish the course.
- ii. The Instructor can see the number of users enrolled in a particular course.

Admin:

- i. Admin is the main developer who can give a user the role of instructor.

1.4 Hardware and Software used in the project

1. VsCode
2. mongoDB
3. Ram 8GB
4. i5 Processor

1.5 Project Features

- i. It deals with the virtual learning system which helps the users to study a course at their respective places without going outside. The user has to enroll into the course using their email Id. If a user has forgotten their password, they can generate their new password using a code which is sent to their email.
- ii. It deals with the different courses where a user can view the study material. A user can register them into multiple courses.
- iii. It deals with the instructor that can create a course, edit the course and publish it. Instructor can view the users that are enrolled into the different courses and take a look over the users and courses .
- iv. It deals with the Admin which is the main developer who can give a user the role of instructor.

2. FEASIBILITY STUDY

A feasibility analysis is used to determine the viability of an idea, such as ensuring a project is legally and technically feasible as well as economically justifiable. It tells us whether a project is worth the investment—in some cases, a project may not be doable. There can be many reasons for this, including requiring too many resources, which not only prevents those resources

from performing other tasks but also may cost more than an organization would earn back by taking on a project that isn't profitable.

A well-designed study should offer a historical background of the business or project, such as a description of the product or service, accounting statements, details of operations and management, marketing research and policies, financial data, legal requirements, and tax obligations. Generally, such studies precede technical development and project implementation.

2.1 Technical feasibility

This assessment focuses on the technical resources available to the organization. It helps organizations determine whether the technical resources meet capacity and whether the technical team is capable of converting the ideas into working systems. Technical feasibility also involves the evaluation of the hardware, software, and other technical requirements of the proposed system.

The organization is able to purchase storage web services and the technology that is being used in this project can be maintained by different developers present inside the organization therefore, this project is technically feasible.

2.2 Behavioral Feasibility

It evaluates and estimates the users' attitude or behavior towards the development of new system. It helps in determining if the system requires special effort to educate, retrain, transfer and how well the users will be able to adapt to it. Since the students are already aware of the concept of online education and the faculty members are aware of online platforms like Moodle, this project is operationally feasible.

2.3 Economical Feasibility

In the Economic Feasibility study, the cost and benefit of the project are analyzed. Which means, under this feasibility study a detail analysis is carried out what will be cost of the project for development which includes all required cost for final development like hardware and software resource required, design and development cost and operational cost and so on. After that it is analyzed whether project will be beneficial in terms of finance for organization or not.

3. Database Used

A properly designed database provides you with access to up-to-date, accurate information. Because a correct design is essential to achieving your goals in working with a database, investing the time required to learn the principles of good design makes sense. In the end, you are much more likely to end up with a database that meets your needs and can easily accommodate change.

The database used here is MongoDB. MongoDB is a document-oriented NoSQL database used for high volume data storage. Instead of using tables and rows as in the traditional relational databases, MongoDB makes use of collections and documents. Documents consist of key-value pairs which are the basic unit of data in MongoDB. Collections contain sets of documents and functions which is the equivalent of relational database tables.

For further storage purposes, Amazon's S3 services are being used to store the video lectures and photos.

4. UML Diagrams

4.1 Flow Chart

A flowchart is a diagram that depicts a process, system or computer algorithm. They are widely used in multiple fields to document, study, plan, improve and communicate often complex processes in clear, easy-to-understand diagrams. Flowcharts use rectangles, ovals, diamonds and potentially numerous other shapes to define the type of step, along with connecting arrows to define flow and sequence.

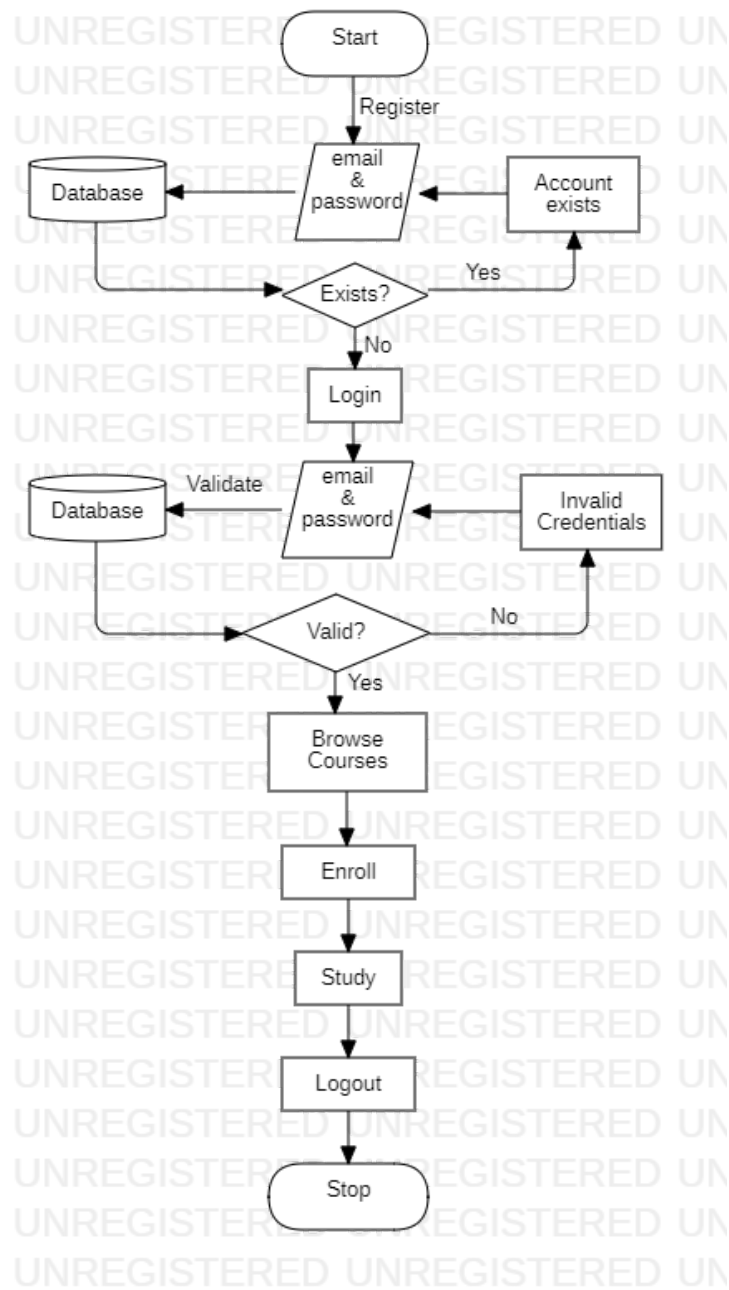


Fig 3.1.1. : Flow Chart

4.2 Use Case Diagram

A use case diagram is a graphical depiction of a user's possible interactions with a system. A use case diagram shows various use cases and different types of users the system has and will often be accompanied by other types of diagrams as well. The use

cases are represented by either circles or ellipses. The actors are often shown as stick figures.

The purpose of a use case diagram is to capture the dynamic aspect of a system. However, this definition is too generic to describe the purpose, as other four diagrams (activity, sequence, collaboration, and State chart) also have the same purpose. We will look into some specific purpose, which will distinguish it from the other four diagrams.

When the initial task is complete, use case diagrams are modeled to present the outside view.

In brief, the purposes of use case diagrams can be said to be as follows –

- i. Used to gather the requirements of a system.
- ii. Used to get an outside view of a system.
- iii. Identify the external and internal factors influencing the system.
- iv. Show the interaction among the requirements and actors.

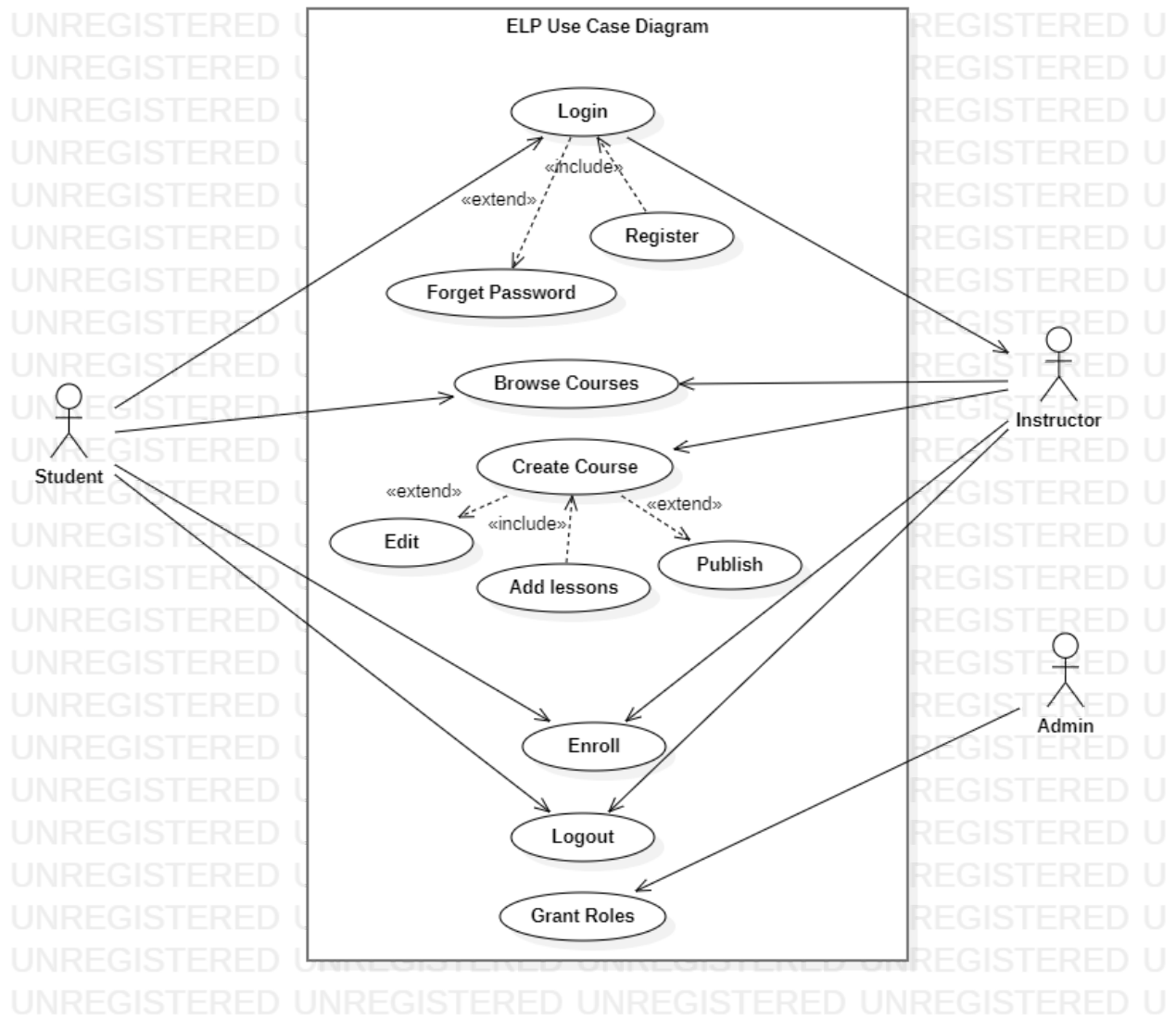


Fig 3.2.1. Use Case Diagram

4.3 Communication Diagram

This communication diagram shows the interactions between the objects or roles associated with lifelines and the messages that pass between lifelines. Communication diagram for ELP is shown in the figure below.

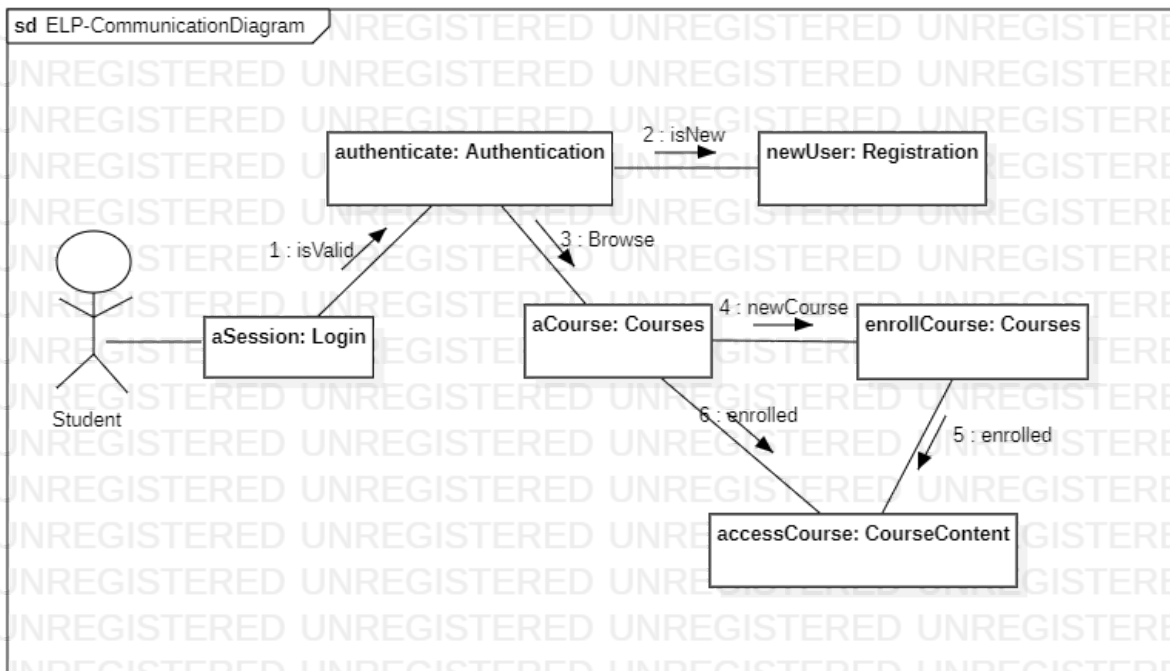


Fig 3.3.1. Communication Diagram

4.4 Activity Diagram

The activity diagram is used to demonstrate the flow of control within the system rather than the implementation. It models the concurrent and sequential activities.

The activity diagram helps in envisioning the workflow from one activity to another. It puts emphasis on the condition of flow and the order in which it occurs. The flow can be sequential, branched, or concurrent, and to deal with such kinds of flows, the activity diagram has come up with a fork, join, etc.

It is also termed as an object-oriented flowchart. It encompasses activities composed of a set of actions or operations that are applied to model the behavioral diagram.

Why Activity Diagram?

An event is created as an activity diagram encompassing a group of nodes associated with edges. To model the behavior of activities, they can be attached to any modeling element. It can model use cases, classes, interfaces, components, and collaborations.

It mainly models processes and workflows. It envisions the dynamic behavior of the system as well as constructs a runnable system that incorporates forward and reverse engineering. It is the same as that of a flowchart but not exactly a flowchart itself. It is used to depict the flow between several activities.

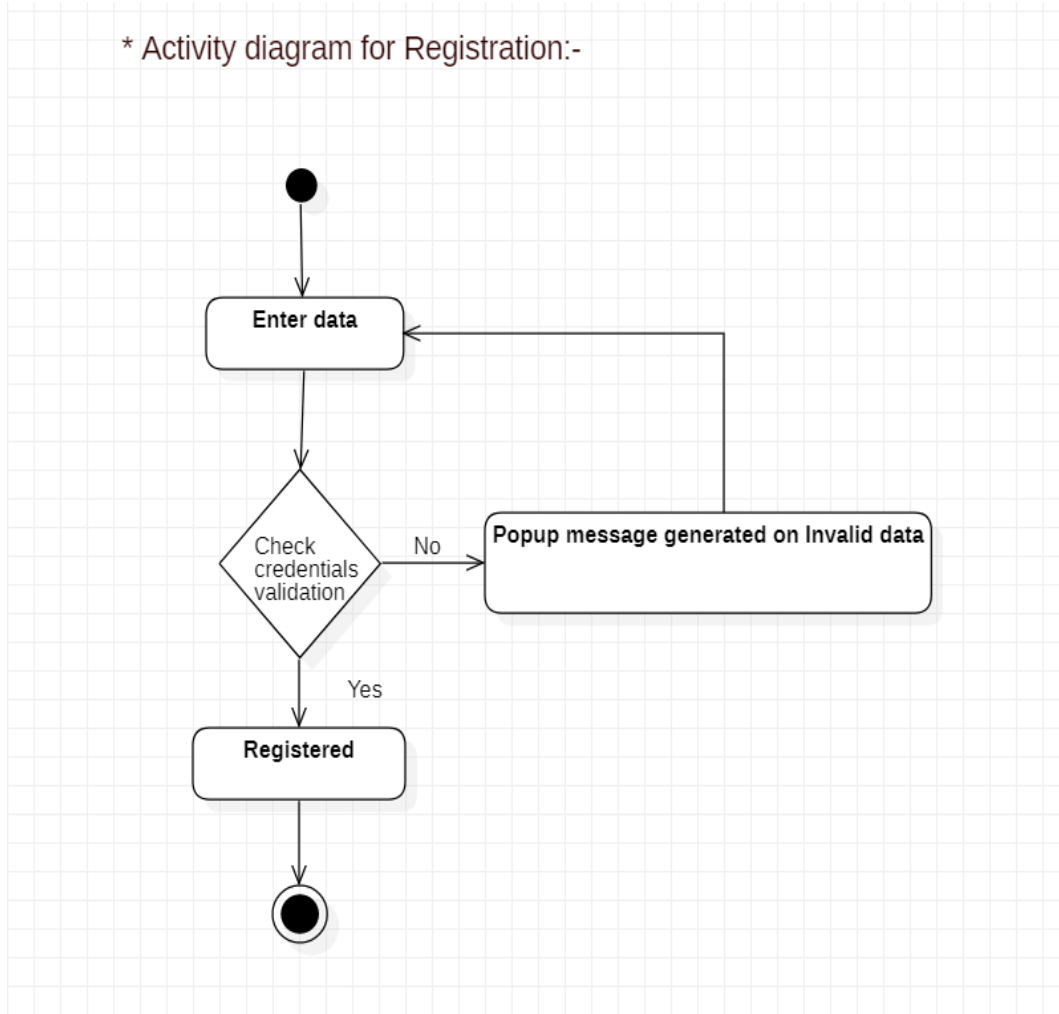


Fig 3.4.1. : Activity Diagram for Registration

* Activity diagram for Login:-

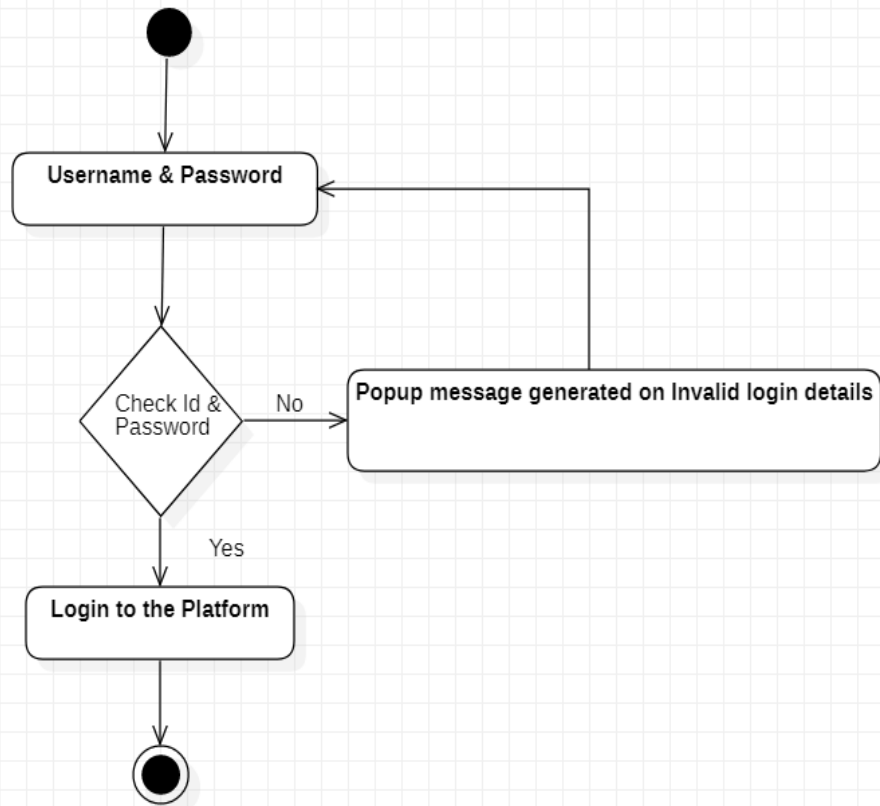


Fig 3.4.2. : Activity Diagram for Login

4.5 Sequence Diagram

It represents the flow of messages in the system and is also termed as an event diagram. It helps in envisioning several dynamic scenarios. It portrays the communication between any two lifelines as a time-ordered sequence of events, such that these lifelines took part at the run time.

The Sequence diagram for the logout module is depicted in figure 3.5.1.

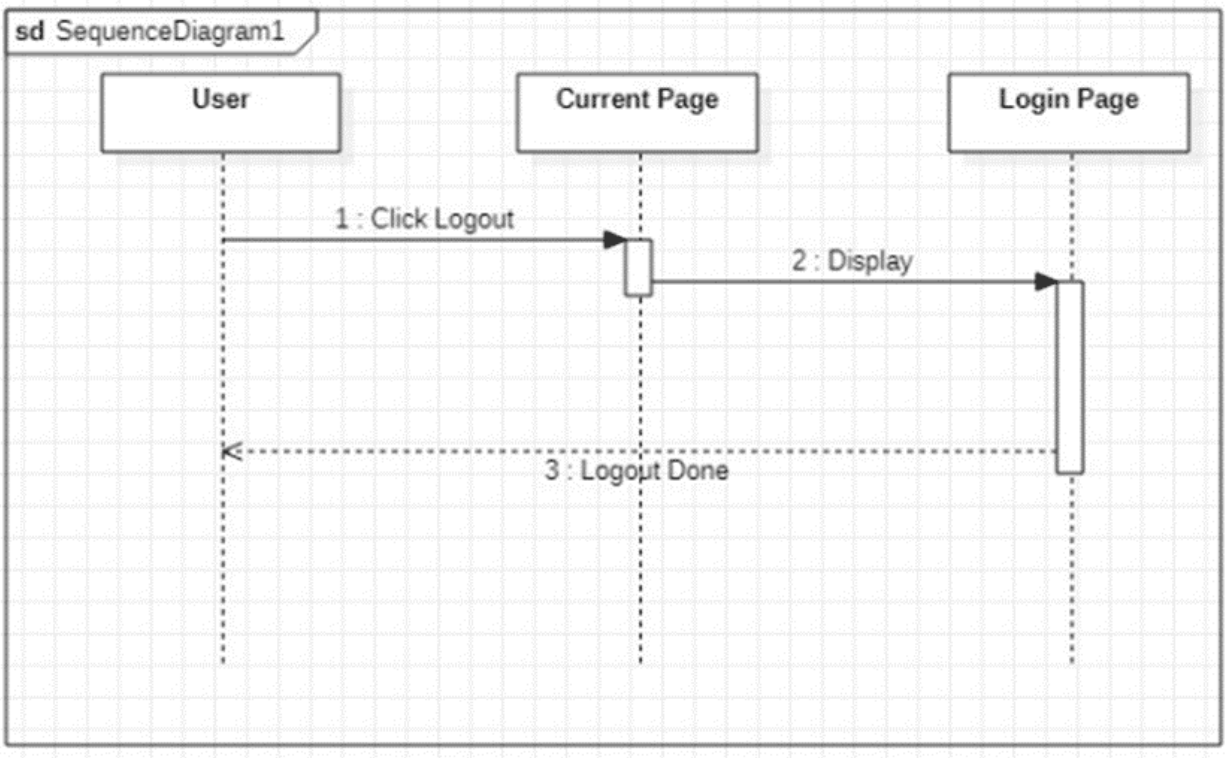






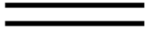






Figure 3.5.1: Sequence Diagram for Logout Module

4.6 E-R Diagram

An Entity Relationship (ER) Diagram is a type of flowchart that illustrates how “entities” such as people, objects or concepts relate to each other within a system. ER Diagrams are most often used to design or debug relational databases in the fields of software engineering, business information systems, education and research. Also known as ERDs or ER Models, they use a defined set of symbols such as rectangles, diamonds, ovals and connecting lines to depict the interconnectedness of entities, relationships and their attributes. They mirror grammatical structure, with entities as nouns and relationships as verbs. ER diagrams are related to data structure diagrams (DSDs), which focus on the relationships of elements within entities instead of relationships between entities themselves. ER diagrams also are often used in conjunction with data flow diagrams (DFDs), which map out the flow of information for processes or systems.

Components of ER Diagram

	Represents Entity
	Represents Attribute
	Represents Relationship
	Links Attribute(s) to entity set(s) or Entity set(s) to Relationship set(s)
	Represents Multivalued Attributes
	Represents Derived Attributes
	Represents Total Participation of Entity
	Represents Weak Entity
	Represents Weak Relationships
	Represents Composite Attributes
	Represents Key Attributes / Single Valued Attributes

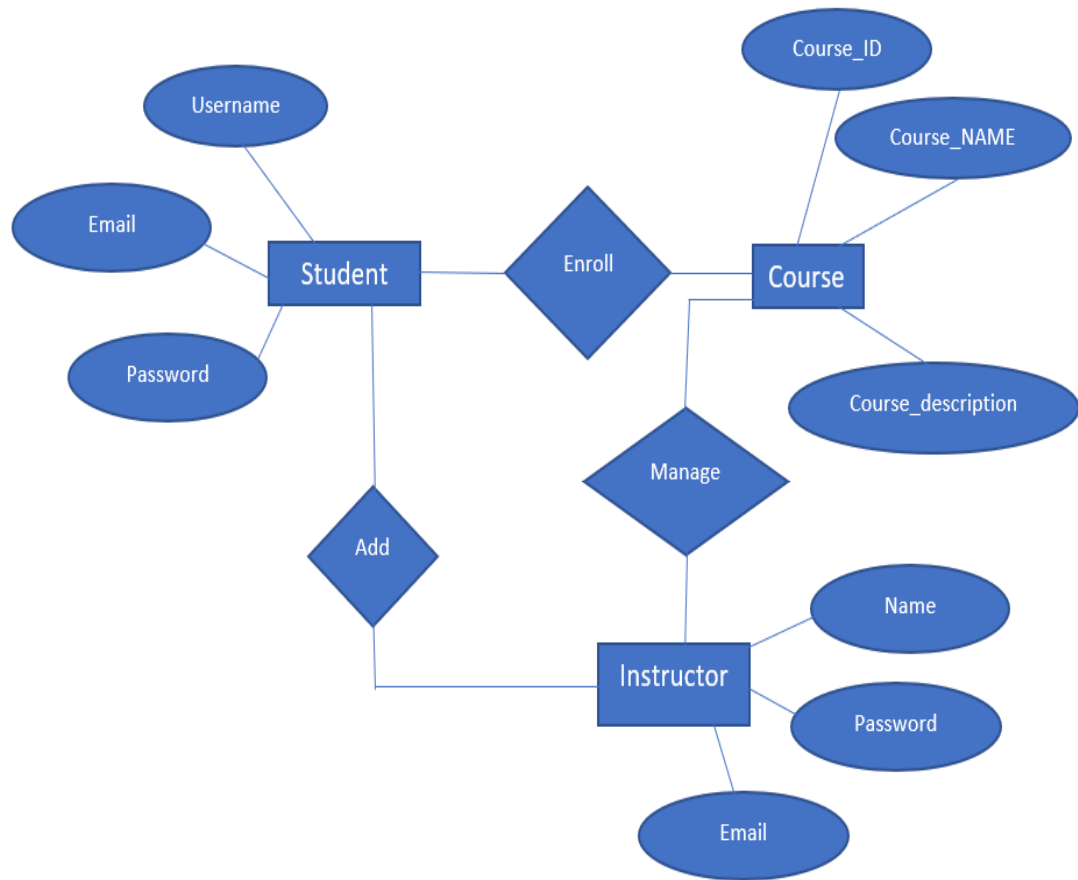


Fig 3.6.1: E-R Diagram

5. SYSTEM FEATURES

5.1 Functional Requirements

5.1.1 Registration Page

REQ-1: The user should be able to view and click on login link

REQ-2: The user should be able to enter the username and Password.

REQ-3: There should be only one account per email else and error pop-up should appear.

5.1.2 Login?Signup Page

REQ-1: The user should be able to view and click on login link

REQ-2: The user should be able to enter and validate the username and Password.

REQ-3: There should be only one account per email else and error pop-up should appear.

5.1.3 View Course

REQ-1: The user should be able to view and click on Courses link.

REQ-2: The user should be able to enroll for a particular course.

REQ-3: The user should be able to view course details by clicking on a particular course.

5.2 User Interfaces

i. Login Display:

This is the login page for User & Instructor. This interface is designed to get the users and instructor register into the courses.

ii. Error message view:

If the user data is not identified with the device, the user has to check whether he has registered using the email which is already in use . This means, this user does not have a record in the system.

iii. Welcome View page:

This page means, the device accepts the user credentials and welcomes them into the enrollment process. So, on the screen, it will show the details of all the courses.

iv. Create a New Course:

This page will appear at the instructor's side. This page will let the instructor create a new course.

v. Edit and Publish a Course:

This page will appear at the instructor's side. Using this page, the instructor can edit the contents of the course and publish the course to the user.

vi. **Add the Instructors:**

This page will appear at the admin's side. Using this page, the admin can assign the instructors to each course.

6. Non-functional Requirements

6.1. Security Requirements

The Current System Security

The current system, which is a website, has its policy on its site page. The current system builds upon a username and password access. Students and faculty can access his/her account through their page, and they can control it.

The system now has its own policy and security; however, the new feature we will add to the system will need some security requirements to the system. The new feature in the system will add some values to the current policy to maintain the security in the right way. It also provides proof of compliance.

The new policy in the system will deal with the security in many cases. The security will have more components on the system in a high control panel. The plan is to secure the outsider and insider community of misused the system (e.g. identification theft). Strong security is part of the policy's purpose.

User Access

Inside the community, there are students and instructors who are going to use the system. The main actor in the entity is users. Users will use the system by logging into the system and access the courses. Instructors can access the system through login and can access the course and users information. Instructor role is to add, edit and publish the courses. Furthermore, Admin can add the instructors into the system.

Threats to the system security

This system may face many threats. Sometimes, it comes from a community insider. This could be someone who discloses the data from the database where it is located.

Levels of security:

The operating system: the security in this case will be in the same level of the website & application security.

The network: it is part of the current system security.

The data management system:

- i. Students can access their courses by login.
- ii. Instructor access websites would be the same as we have now, and they will control the courses and users .
- iii. The purpose of the admin is to make an instructor.

Level of access

Subject:

People level:

- 1) Users (students).
- 2) Instructor (Control on Courses and users).
- 3) Admin (add and control the Instructor).

Reference Monitor

The authorization and the access control present in the security matrix below:

Instructor can login and create, edit, publish the “Courses”

Admin can assign the users the role of “Instructor”.

Users are able to Enroll into the “Courses” and view the ‘Courses’.

7. User Interface Screenshots

7.1 Registration Page (Screenshot)

App Login Register

Register

Ryan

ryan@gmail.com

Submit

Already registered? [Login](#)

7.2 Login Page (Screenshot)

App Login Register

Login

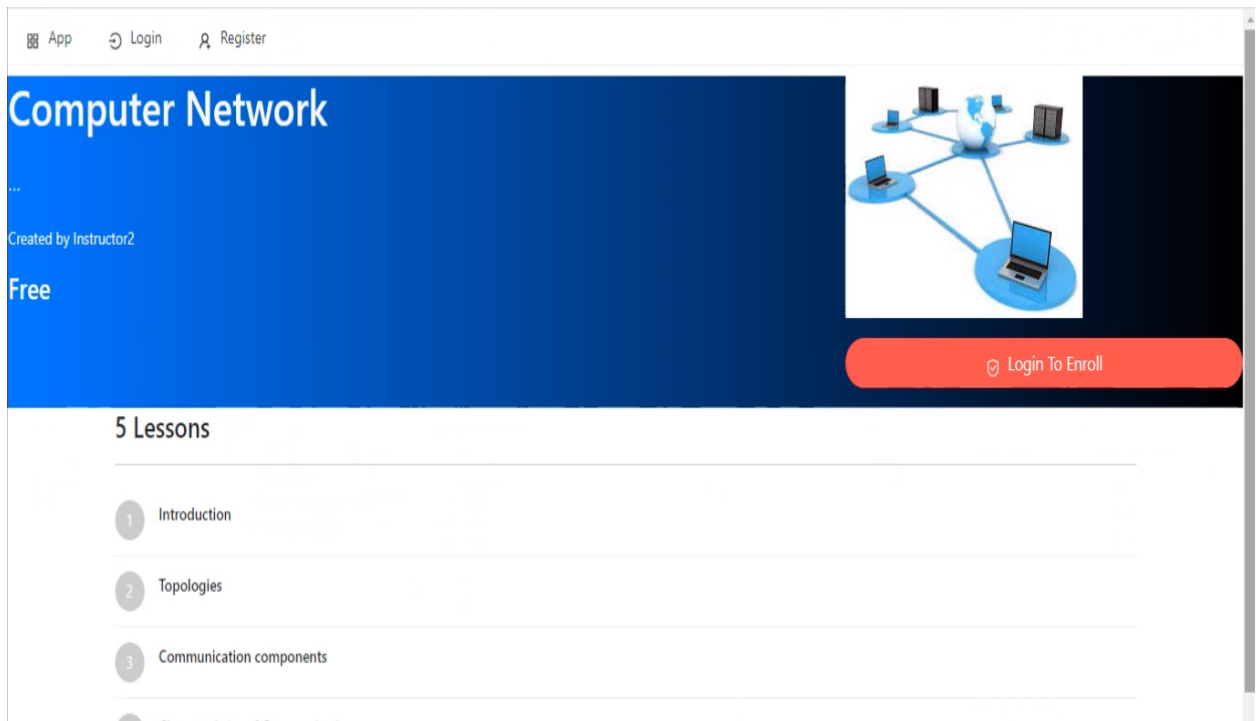
instructor@gmail.com

Submit

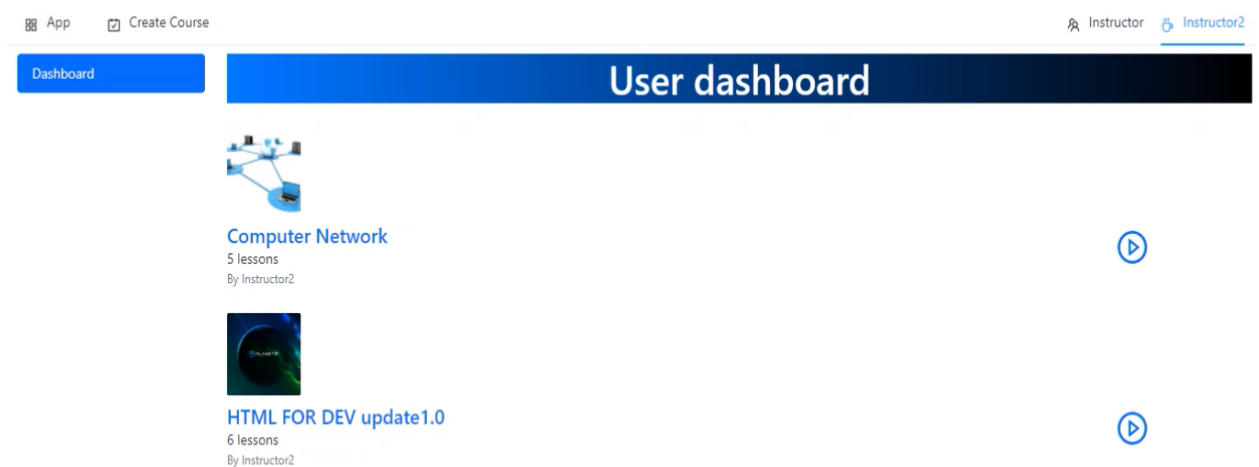
Not yet registered? [Register](#)

[Forgot password](#)

7.3 Course Enroll Page (Screenshot)



7.4 User Dashboard (Screenshot)

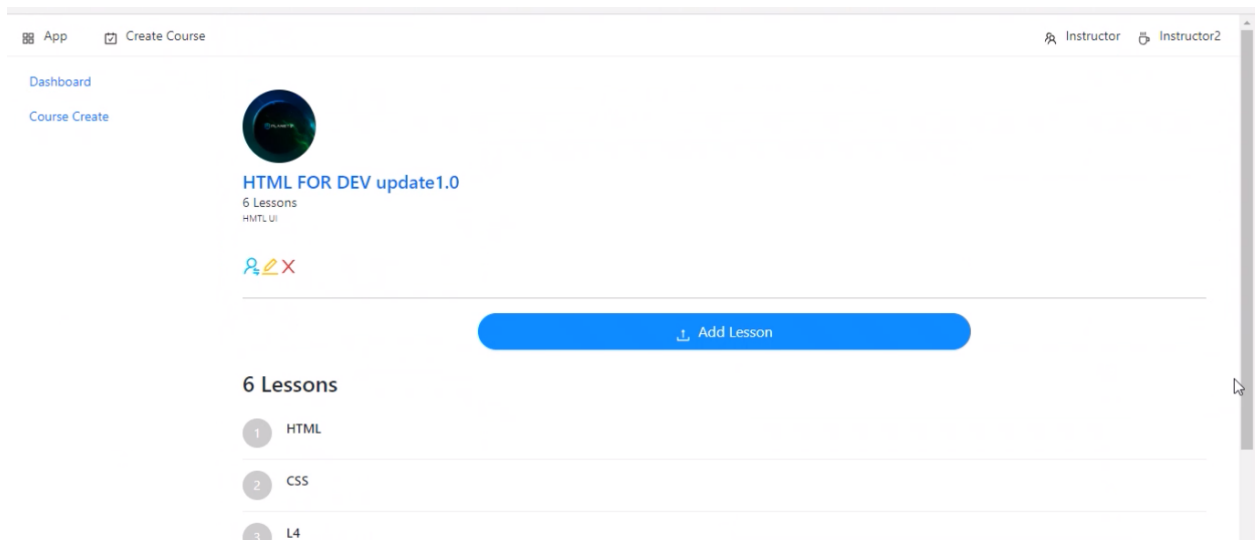


7.5 Instructor Dashboard (Screenshot)

The screenshot displays the Instructor Dashboard interface. At the top, there is a navigation bar with a hamburger menu icon, 'App', 'Create Course', and user profiles for 'Instructor' and 'Instructor2'. Below this, a blue sidebar contains a 'Dashboard' button and a 'Course Create' link. The main content area is titled 'Instructor Dashboard' and lists three courses:

- HTML FOR DEV update1.0**: 6 Lessons, Your course is live in the marketplace. Status:
- Computer Network**: 5 Lessons, Your course is live in the marketplace. Status:
- Cloud Computing**: Status:

7.6 Edit Course



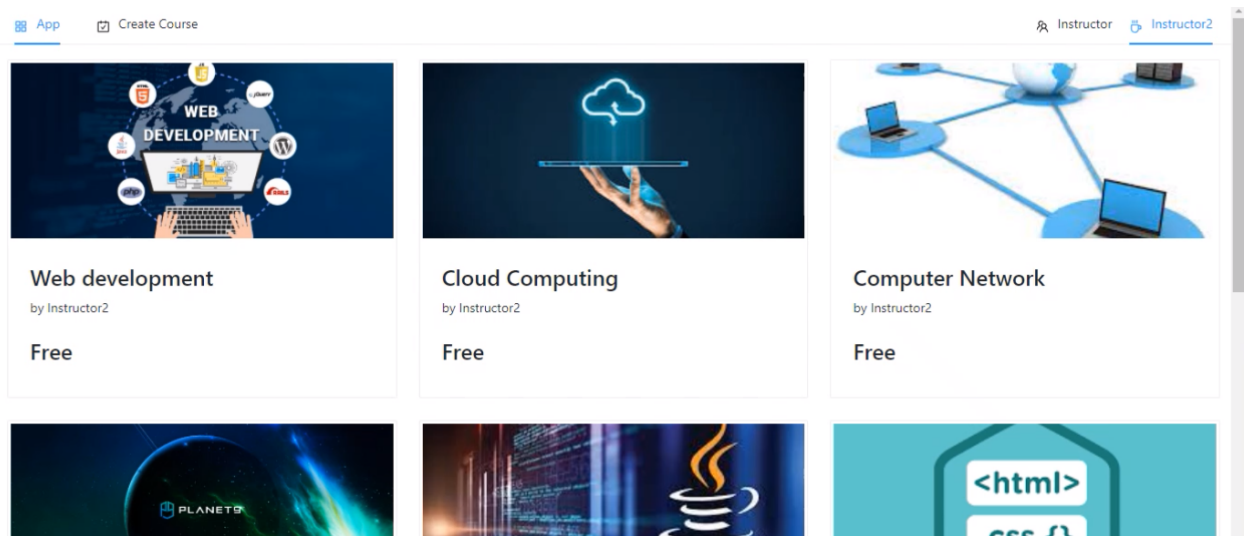
7.7 Create New Course Page (Screenshot)

This screenshot displays the 'Create Course' form. The top navigation bar is identical to the previous image. The sidebar on the left has 'Dashboard' and 'Course Create' (the latter is highlighted with a blue background). A large blue header bar at the top of the form area reads 'Create Course'. The form itself contains several input fields: 'Name' (with a large text area below it), 'Free' (a dropdown menu), and 'Category'. There is an 'Upload Image' button and a blue 'Save & Continue' button. At the bottom, a JSON snippet is visible:

```
{  
  "name": "",  
}
```

 A mouse cursor is positioned over the 'Upload Image' button. The right edge of the image shows a vertical scrollbar.

7.8 Courses Page (Screenshot)



8. CODING

8.1 User Navbar

```
import { useState, useEffect } from "react";
import Link from "next/link";

const UserNav = () => {
  const [current, setCurrent] = useState("");

  useEffect(() => {
    process.browser && setCurrent(window.location.pathname);
  }, [process.browser && window.location.pathname]);

  return (
    <div className="nav flex-column nav-pills">
      <Link href="/user">
        <a className={`nav-link ${current === "/user" && "active"}}`>
          Dashboard
        </a>
      </Link>
    </div>
  )
}
```

```

    );
};

export default UserNav;

```

8.2 Instructor Navbar

```

import { useState, useEffect } from "react";
import Link from "next/link";

const InstructorNav = () => {
  const [current, setCurrent] = useState("");

  useEffect(() => {
    process.browser && setCurrent(window.location.pathname);
  }, [process.browser && window.location.pathname]);

  return (
    <div className="nav flex-column nav-pills">
      <Link href="/instructor">
        <a className={`nav-link ${current === "/instructor" &&
"active"}}`>
          Dashboard
        </a>
      </Link>
      <Link href="/instructor/course/create">
        <a
          className={`nav-link ${
            current === "/instructor/course/create" && "active"
          }`>
          Course Create
        </a>
      </Link>
    </div>
  );
};

export default InstructorNav;

```

8.3 User Routes

```
import { useEffect, useState } from "react";
import axios from "axios";
import { useRouter } from "next/router";
import { SyncOutlined } from "@ant-design/icons";
import UserNav from "../nav/UserNav";
const UserRoute = ({ children }) => {
  // state
  const [ok, setOk] = useState(false);
  // router
  const router = useRouter();

  useEffect(() => {
    fetchUser();
  }, []);

  const fetchUser = async () => {
    try {
      const { data } = await axios.get("/api/current-user");
      // console.log(data);
      if (data.ok) setOk(true);
    } catch (err) {
      console.log(err);
      setOk(false);
      router.push("/login");
    }
  };

  return (
    <>
      {!ok ? (
        <SyncOutlined
          spin
          className="d-flex justify-content-center display-1 text-primary
p-5"
        />
      ) : (
```

```

<div className="container-fluid">
  <div className="row">
    <div className="col-md-2">
      <UserNav />
    </div>
    <div className="col-md-10">{children}</div>
  </div>
</div>

  )}
</>

);

};

export default UserRoute;

```

9 TESTING

Project Name: E-Learning Platform(ELP)
 Team Leader: Kajal Punia
 Execution Date: 08/12/2021

Project ID: SN1
 QA Manager:

Test Cases										
Test Case Id	Component	Priority	Test cases	Description/Test Summary	Pre-requisites	Test Steps	Expected Result	Actual Result	Status	Test Executed By
TC01	Registration	p10	TC01.1	To verify that when a user enters an unregistered email address and presses enter, an OTP must be sent to that email and a page should open that will ask the user to enter the OTP(One Time Password).	ELP website must be open.	1. Click on the register option. 2. Once the registration page is launched, enter a valid and unregistered email address. 3. Press enter	An OTP should be sent to the entered email address and next page should be launched where the user needs to enter the OTP.	An OTP sent to the entered email address and next page launched where the user needs to enter the OTP.	Pass	
			TC01.2	To verify that when a user enters an already registered email address then an error message should pop up saying "Account already exists, login instead".	A registered email address and ELP website must be open.	1. Click on the register option. 2. Once the registration page is launched, enter an already registered email address. 3. Press enter	An error message should pop up saying "Account already exists, login instead".	An error message pops up saying "Account already exists, login instead".	Pass	
			TC01.3	To verify that when a user enters an invalid email address then an error message should pop up saying "Enter a valid email address".	ELP website must be open.	1. Click on the register option. 2. Once the registration page is launched, enter an invalid email address. 3. Press enter	An error message should pop up saying "Enter a valid email address".	An error message pops up saying "Enter a valid email address".	Pass	
TC02	Login	p10	TC02.1	To verify that when a user enters a registered email address and presses enter, next page should be launched where the user needs to enter the password.	ELP website must be open.	1. Click on the Login option. 2. Once the Login page is launched, enter a registered email address. 3. Press enter	Next page should be launched where the user needs to enter the password.	Next page launched to enter the password.	Pass	
			TC02.2	To verify that when a user enters an unregistered email address and presses enter, an error message must pop up saying "No such account found, Login instead".	ELP website must be open.	1. Click on the Login option. 2. Once the Login page is launched, enter an unregistered email. 3. Press enter	An error message should pop up saying "No such account found, Login instead."	An error message pops up saying "No such account found, Login instead."	Pass	

			TC02.3	To verify that when a user enters an invalid email address and presses enter, an error message must pop up saying "Enter a valid email address".	ELP website must be open.	1. Click on the Login option. 2. Once the Login page is launched, enter an invalid email. 3. Press enter	An error message should pop up saying "Enter a valid email address."	An error message pops up saying "Enter a valid email address."	Pass	
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TC03	Search_Bar_Module	P5	TC03.1	To verify that when a user writes a search term and presses enter, search results should be displayed.	ELP website must be open.	1. Write the write the name of the course or subject in the search bar. 2. Press enter	Search results related to the searched term should be displayed	Search results with 'searched term' keywords are displayed.	Pass	
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