MERN stack powered by MongoDB
Naan Mudhalvan - Project Documentation

Introduction

Project Title: Learn Hub (Online Learning Platform)

College: Madras Institute of Technology

Department: B.Tech IT 7th Sem

Team Members:

S.No	Student Name	Register No.	Naan Mudhalvan ID
1.	Rubesh VC	2021506075	20880580724D5629CE44864458BC3355
2.	Sanjay M	2021506086	A02173E2397AF698B51416BCFB7D4E1C
3.	Shyaam Sridhar	2021506099	1134FDF3818E6338DF640F504763EBE7
4.	Suriya R	2021506112	00B4027863F8A9BA5B34C133EBC9D7ED
5.	Tharun S	2021506114	E918FCBCBD9CDA6B3834DD8CF39147A2

Project Overview

Purpose:

LearnHub is an online learning platform designed to connect students and instructors in a collaborative learning environment. The platform facilitates course creation, student enrollment, and a discussion forum, providing a user-friendly interface.

Features:

- **Student/User:**
  - Signup with email verification and OTP-based password reset.
  - View all available courses and access enrolled courses.
  - Discussion forum for creating or continuing threads.
  - Editable profile except for email.
- **Instructor:**
  - Create, edit, and delete courses.
  - Upload course sections, including videos and descriptions.
  - View enrolled students for their courses.
  - Editable profile except for email.

    - **Admin:**
        - View all registered users, instructors, and courses.
        - Delete courses if necessary.
        - Popup view for instructor-specific courses.
- **Exclusions:**
    - No payment gateway (replaced with a dummy page).
    - Admin login not implemented (accessed via route).

Architecture

Frontend:

- Developed using **React**, styled with **Bootstrap**, and built with **Vite** for optimized performance.
- Responsive design ensures usability across devices.

Backend:

- Built using **Node.js** and **Express.js** to handle APIs and business logic.
- Middleware includes:
    - **bcryptjs** for password hashing.
    - **jsonwebtoken** for authentication.
    - **Multer** for file handling.

Database:

- **MongoDB** as the database solution, implemented with **Mongoose** for schema design and data interaction.

Setup Instructions

Prerequisites:

- Node.js
- MongoDB Atlas Account
- Cloudinary account for image and video storage.

Installation:

1. **Clone the repository:**

   ```
   git clone https://github.com/Thaerun/Mern-Stack---Online-learning-platform- cd online-learning-platform
   ```

2. **Install dependencies:**
   - **Frontend:**

     ```
     cd client
     npm install
     ```

   - **Backend:**

     ```
     cd server
     npm install
     ```

3. **Set up environment variables:**
   - Create **.env** file in the **server** folder with the following:

```
MONGODB_URI='mongodb+srv://dhineshkumar1729:qwertyuiop@cluster0.cwt4c.mongodb.net/?retryWrites=true&w=majority&appName=Cluster0'
JWT_SECRET='t9843yt8hg0h8y834th893hy89h'
EMAIL_USER='dhineshkumar24murugan007@gmail.com'
EMAIL_PASS='szlv xili ndrw qasg'
CLOUDINARY_CLOUD_NAME='dgosdgcem'
CLOUDINARY_API_KEY='695861773226449'
CLOUDINARY_API_SECRET='H7QShPl9ouKwmBTdrmnFihgaIIU'
```

   - Create **.env.local** file in the **client** folder with the following:

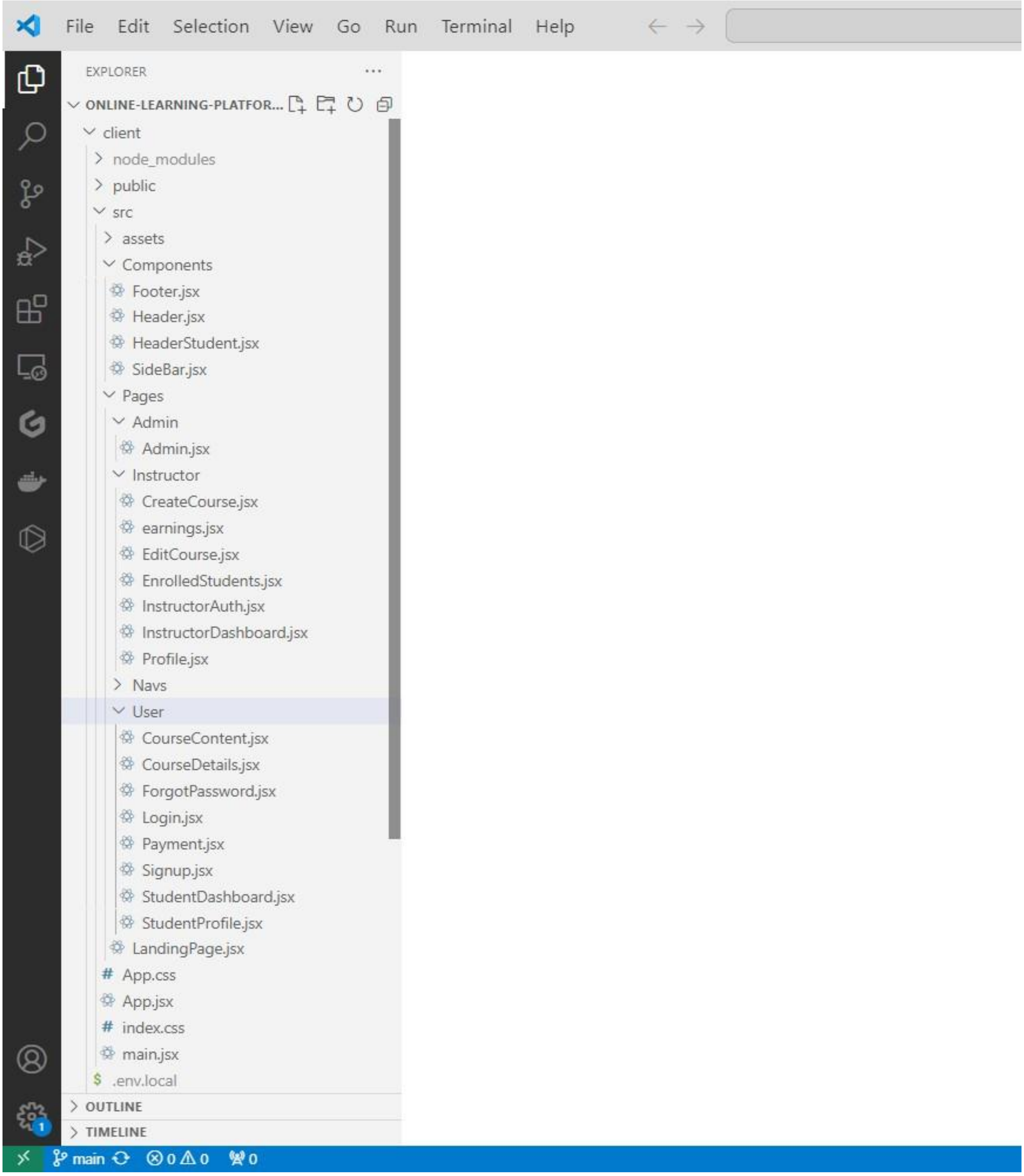
```
VITE_REACT_APP_BACKEND_BASEURL=http://localhost:5000
```

Folder Structure

Client (Frontend):

- **src/:** Contains all React components, pages, and assets.
  - **Components/:** Reusable UI components such as Footer, Header, HeaderStudent and SideBar

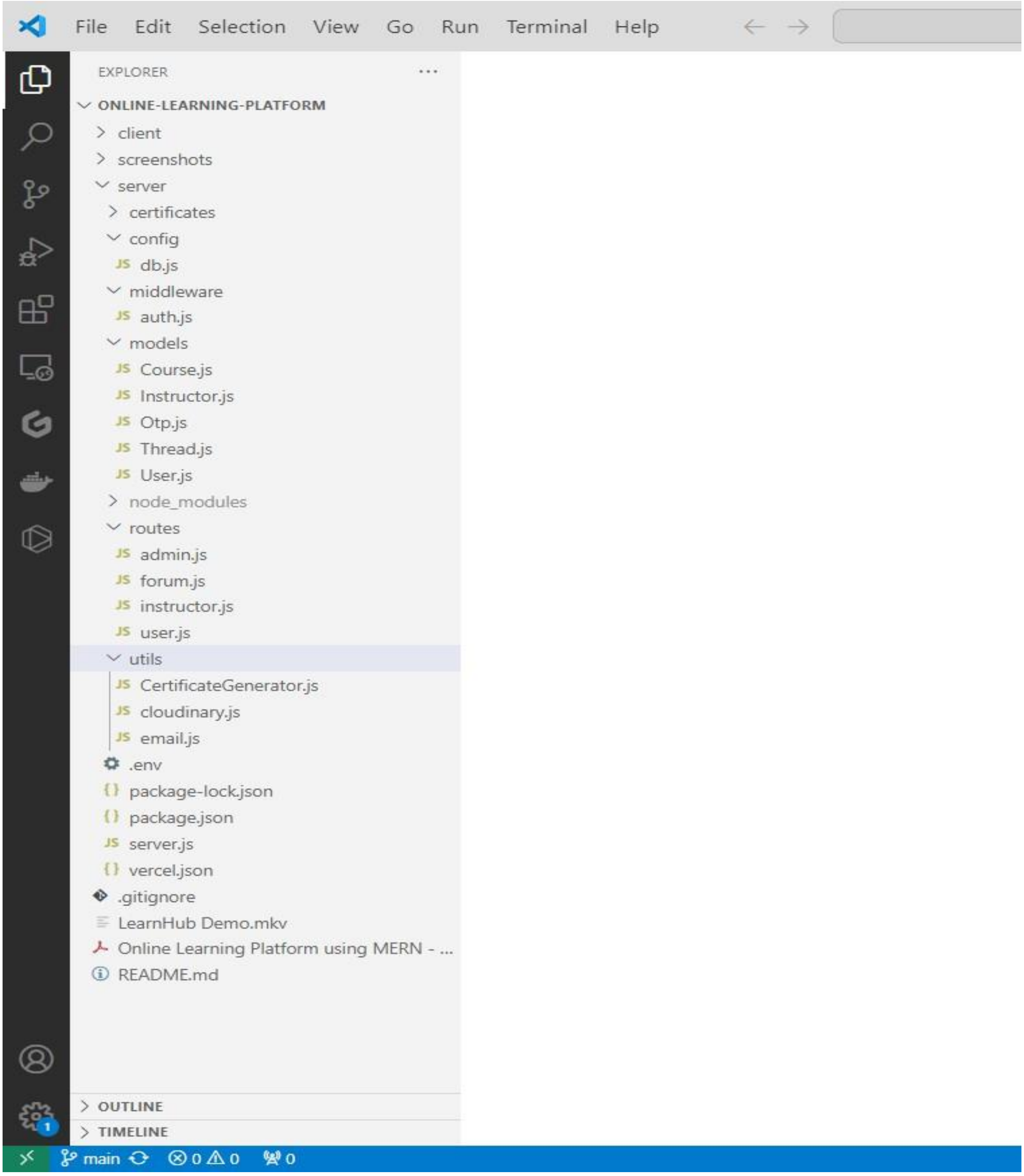
- **Pages/:** Folders such as Admin, User, Instructor and Navs containing Pages for different aspects of the application.



```
ONLINE-LEARNING-PLATFOR...
  client
    node_modules
    public
    src
      assets
      Components
        Footer.jsx
        Header.jsx
        HeaderStudent.jsx
        SideBar.jsx
      Pages
        Admin
          Admin.jsx
        Instructor
          CreateCourse.jsx
          earnings.jsx
          EditCourse.jsx
          EnrolledStudents.jsx
          InstructorAuth.jsx
          InstructorDashboard.jsx
          Profile.jsx
        Navs
        User
          CourseContent.jsx
          CourseDetails.jsx
          ForgotPassword.jsx
          Login.jsx
          Payment.jsx
          Signup.jsx
          StudentDashboard.jsx
          StudentProfile.jsx
        LandingPage.jsx
      App.css
      App.jsx
      index.css
      main.jsx
    .env.local
```

Server (Backend):

- **routes/:** Defines API routes for users, instructors, forums, and admin.
- **models/:** MongoDB schemas for Users, Courses, Instructor, Thread and OTP.
- **middleware/:** Authentication using jwt token.
- **utils/:** Contains the Cloudinary API and Certificate Generation code.



```
ONLINE-LEARNING-PLATFORM
  client
  screenshots
  server
    certificates
    config
      db.js
    middleware
      auth.js
    models
      Course.js
      Instructor.js
      Otp.js
      Thread.js
      User.js
    node_modules
    routes
      admin.js
      forum.js
      instructor.js
      user.js
    utils
      CertificateGenerator.js
      cloudinary.js
      email.js
    .env
    package-lock.json
    package.json
    server.js
    vercel.json
  .gitignore
  LearnHub Demo.mkv
  Online Learning Platform using MERN - ...
  README.md
```

Running the Application

- **Frontend:**

  ```
  cd client
  npm run dev
  ```

- **Backend:**

  ```
  cd server
  nodemon server.js (or) node server.js
  ```

API Documentation

User Routes:

- **POST /signup**: Register a new user.
- **POST /login**: Login user.
- **GET /verify-email:** To verify the newly registered user.
- **POST /forgot-password**: Send OTP for password reset.
- **POST /verify-otp:** To verify the OTP for changing password.
- **POST /update-password:** Changes the password of the user.
- **PUT /addCourse:** For adding the course to the purchased course list.
- **GET /student/:userEmail:** For fetching the users' profile.
- **PUT /student/:userEmail:** To update the users' profile.
- **POST /upload-profile-image-user:** For updating/uploading the profile image.
- **GET /name:** To fetch the user's name using the email id.
- **GET /student-dashboard/courses:** Gets all the courses of the platform.
- **GET /student-dashboard/my-courses:** Fetch the courses enrolled by the user.
- **GET /course-content:** Get course content by courseId
- **POST /update-progress:** Mark section as completed & update last-viewed section
- **POST /generate-certificate:** To create and download the certificate after course completion.
- **POST /check-course-purchase:** Check whether the user is enrolled or not in a course.
- **GET /courses:** Fetch all courses for header student

- **GET /:email:** Fetch user by email to get purchased courses for header student
- **GET /instructors/:instructorEmail:** To fetch the instructor using email id
- **GET /courses/:coursed:** Fetch the specified course details

Instructor Routes:

- **POST /signup**: Register a new user.
- **POST /login**: Login user.
- **GET /verify-email-instructor:** To verify the newly registered user.
- **POST /forgot-password**: Send OTP for password reset.
- **POST /verify-otp:** To verify the OTP for changing password.
- **POST /update-password:** Changes the password of the user.
- **GET /:instructorEmail:** Fetches the instructor's profile
- **PUT /:instructorEmail:** Updates the instructor's profile
- **POST /upload-profile-image:** Uploads the instructor's profile image
- **GET /courses/:instructorEmail/:courseId/students:** Fetch students enrolled in a specific course, only for the instructor who created the course
- **GET /courses/:instructorEmail:** Fetch all courses taught by a specific instructor
- **POST /courses:** Get courses based on the instructor email id.
- **DELETE /courses/:id:** Delete course Route
- **GET /courses/edit-courses/:id:** Get course by ID Route
- **PUT /courses/:id:** Delete a course by its ID
- **POST /upload-video:** Video upload route using Cloudinary
- **POST /upload-image:** Image upload route using Cloudinary
- **POST /create-course:** To create a new course.

Admin Routes:

- **GET /users**: View all registered users.
- **GET /instructors:** View all registered instructors.
- **GET /courses:** Get all the courses in the platform
- **DELETE /courses/:id:** Delete a specific course.
- **GET /instructors/:email/courses:** To get the courses of any particular instructor.

Forums Routes:

- **GET /:courseId/threads:** Get all messages for a specific course's discussion thread
- **POST /:courseId/threads:** Post a new message to a specific course's discussion thread

Authentication

- **JWT (JSON Web Tokens):**
  - Tokens generated on successful login.
  - Middleware checks token validity for protected routes.
- **Email Verification:**
  - Verification link sent during signup using **Nodemailer**.
- **OTP-based Password Reset:**
  - OTP sent via email for secure password reset.

User Interface

- **Student Dashboard:** Displays enrolled courses, profile management, and discussion forum.
- **Instructor Dashboard:** Course creation tools and enrolled students' view.
- **Admin View:** User, instructor, and course management in a streamlined UI.

Testing

- **Manual Testing:** Verified all major functionalities including user signup, course creation, and discussion threads.
- **Postman:** Used for API endpoint testing.

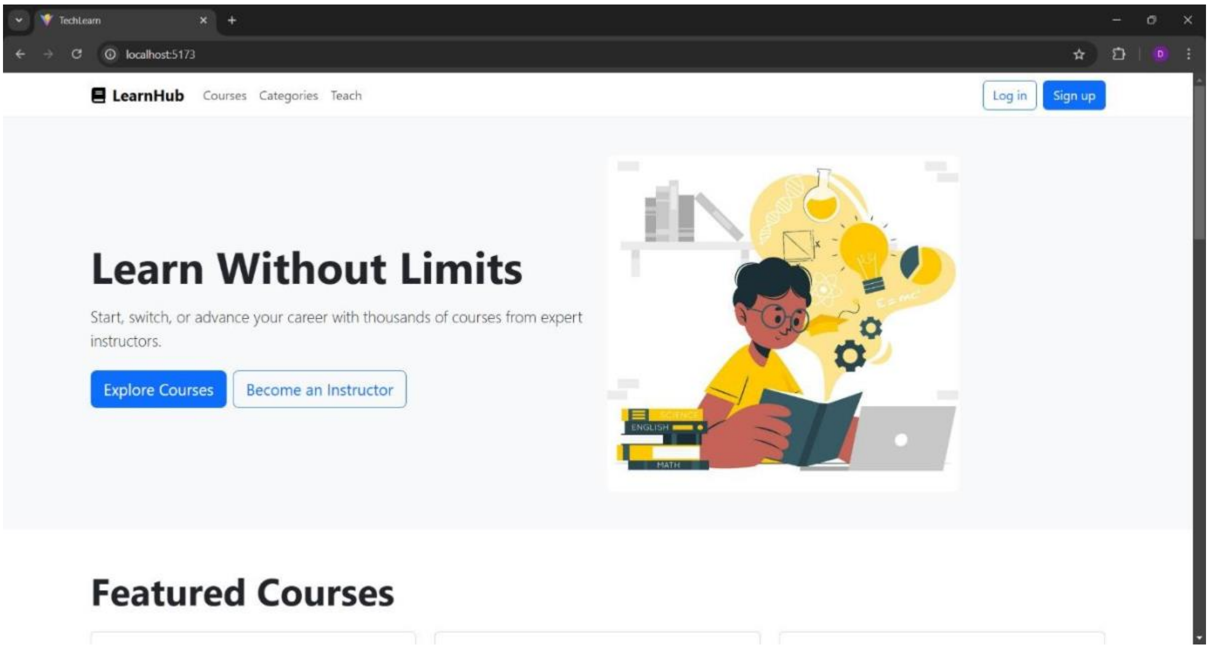
Screenshots or Demo

- **Demo Link:**

  https://drive.google.com/file/d/1sRD8UJORug85jKQOIWeaz-zySulD8V5P/view?usp=drivesdk

- **Screenshots:**

1. Landing Page

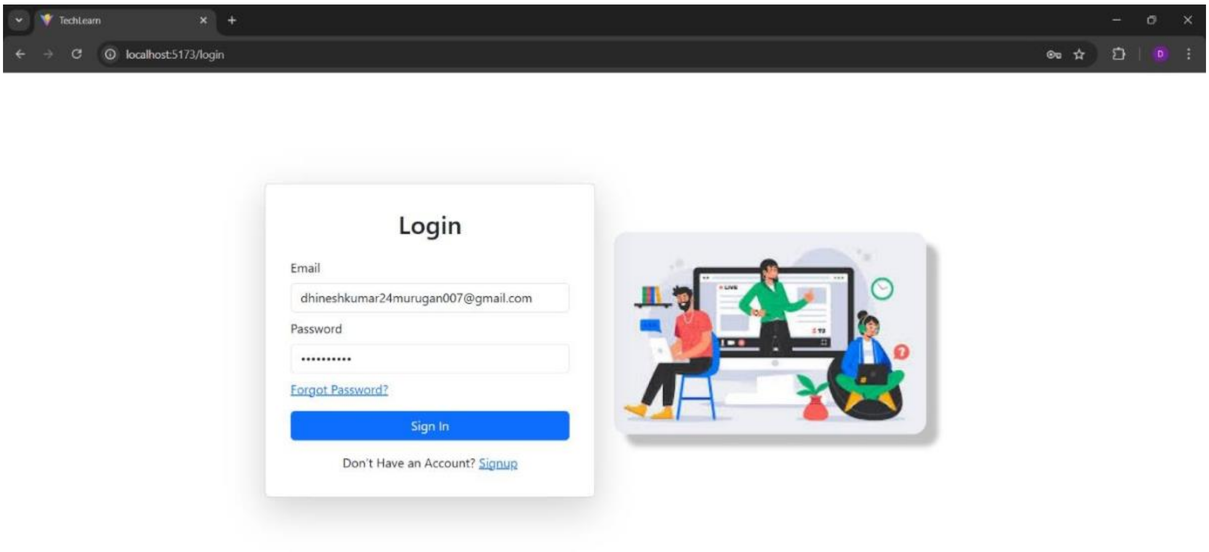


Learn Without Limits

Start, switch, or advance your career with thousands of courses from expert instructors.

Featured Courses

2. User Login



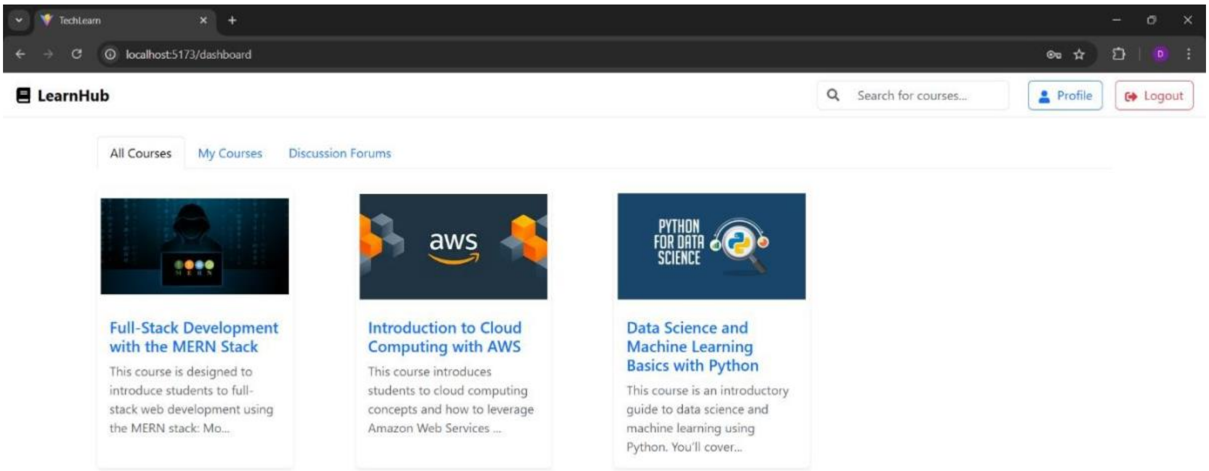
Login

Email: dhineshkumar24murugan007@gmail.com

Password: ••••••••••

Don't Have an Account? Signup

3. User Dashboard



TechLearn

localhost:5173/dashboard

LearnHub

Search for courses...

Profile

Logout

All Courses | My Courses | Discussion Forums

Full-Stack Development with the MERN Stack

This course is designed to introduce students to full-stack web development using the MERN stack: Mo...

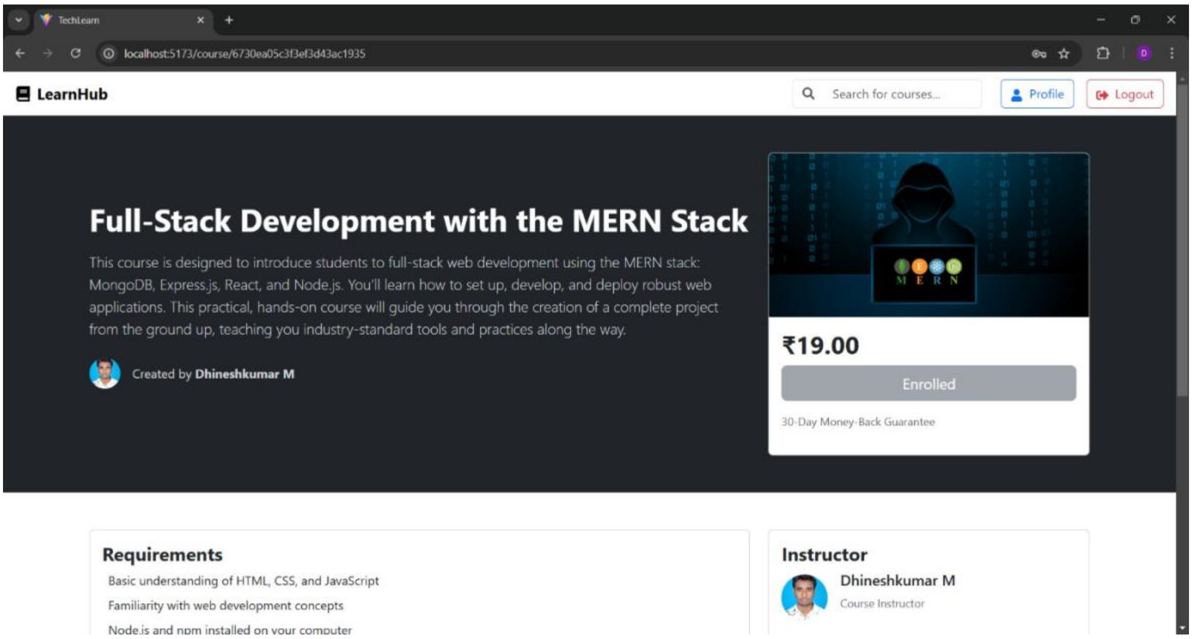
Introduction to Cloud Computing with AWS

This course introduces students to cloud computing concepts and how to leverage Amazon Web Services ...

Data Science and Machine Learning Basics with Python

This course is an introductory guide to data science and machine learning using Python. You'll cover...

4. User Course Details



TechLearn

localhost:5173/course/6730ea05c3f3ef3d43ac1935

LearnHub

Search for courses...

Profile

Logout

Full-Stack Development with the MERN Stack

This course is designed to introduce students to full-stack web development using the MERN stack: MongoDB, Express.js, React, and Node.js. You'll learn how to set up, develop, and deploy robust web applications. This practical, hands-on course will guide you through the creation of a complete project from the ground up, teaching you industry-standard tools and practices along the way.

Created by **Dhineshkumar M**

₹19.00

Enrolled

30-Day Money-Back Guarantee

Requirements

Basic understanding of HTML, CSS, and JavaScript

Familiarity with web development concepts

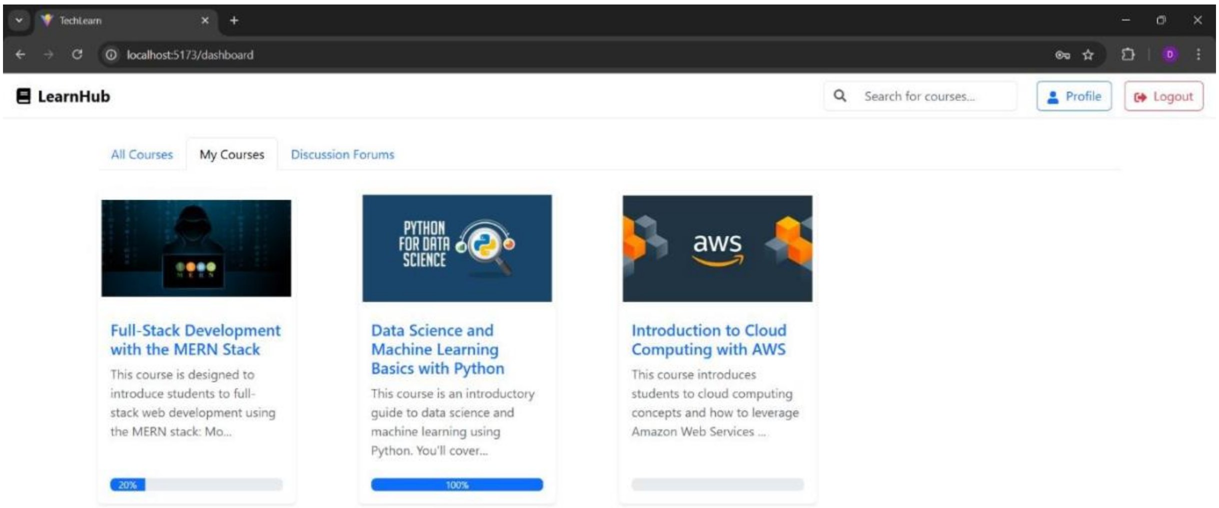
Node.js and npm installed on your computer

Instructor

Dhineshkumar M

Course Instructor

5. User My Courses Page



Full-Stack Development with the MERN Stack

This course is designed to introduce students to full-stack web development using the MERN stack: Mo...

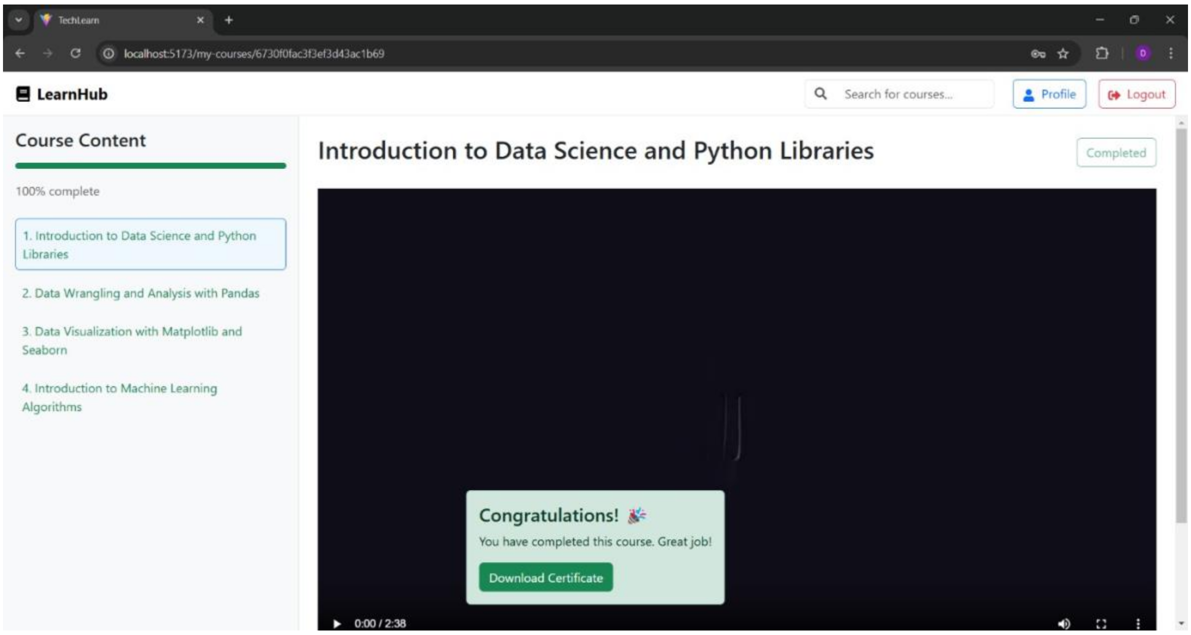
Data Science and Machine Learning Basics with Python

This course is an introductory guide to data science and machine learning using Python. You'll cover...

Introduction to Cloud Computing with AWS

This course introduces students to cloud computing concepts and how to leverage Amazon Web Services ...

6. User Course Access



Course Content

100% complete

1. Introduction to Data Science and Python Libraries
2. Data Wrangling and Analysis with Pandas
3. Data Visualization with Matplotlib and Seaborn
4. Introduction to Machine Learning Algorithms

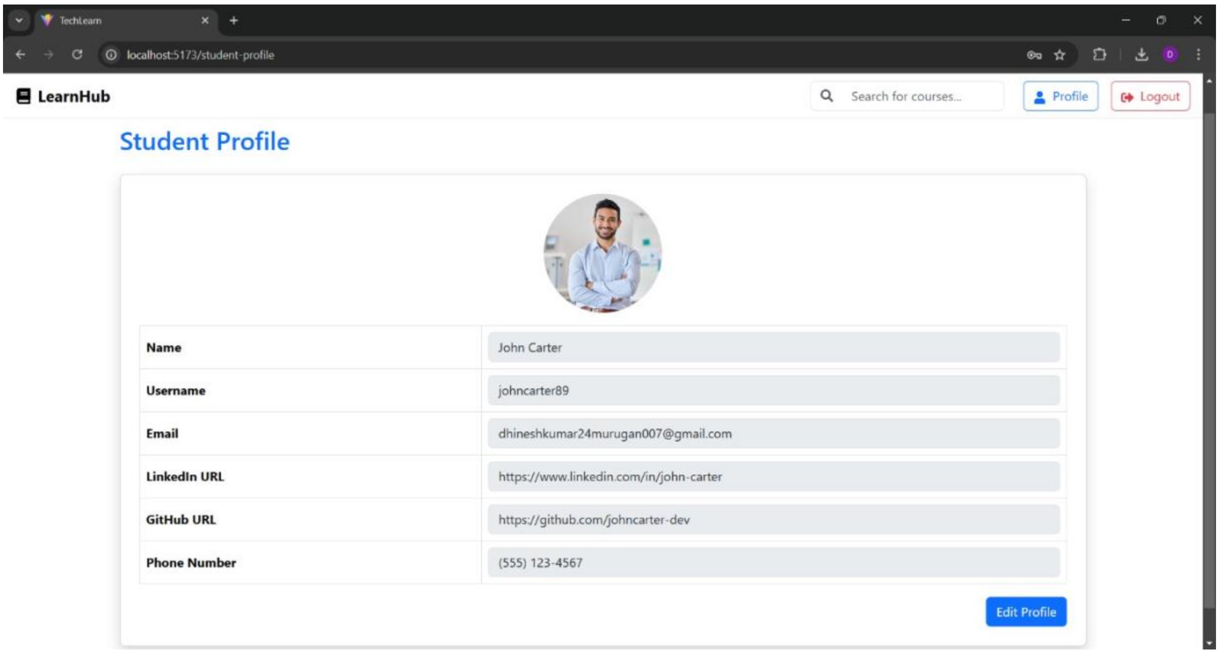
Introduction to Data Science and Python Libraries

Congratulations! 🎉

You have completed this course. Great job!

Download Certificate

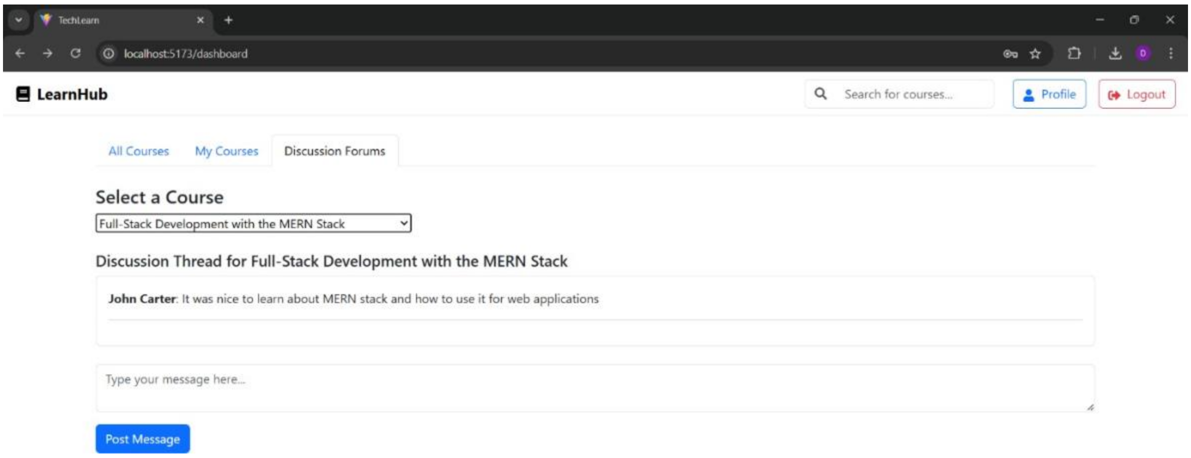
7. User Profile Page



Student Profile

Name	John Carter
Username	johncarter89
Email	dhineshkumar24murugan007@gmail.com
LinkedIn URL	https://www.linkedin.com/in/john-carter
GitHub URL	https://github.com/johncarter-dev
Phone Number	(555) 123-4567

8. User Discussion Forums



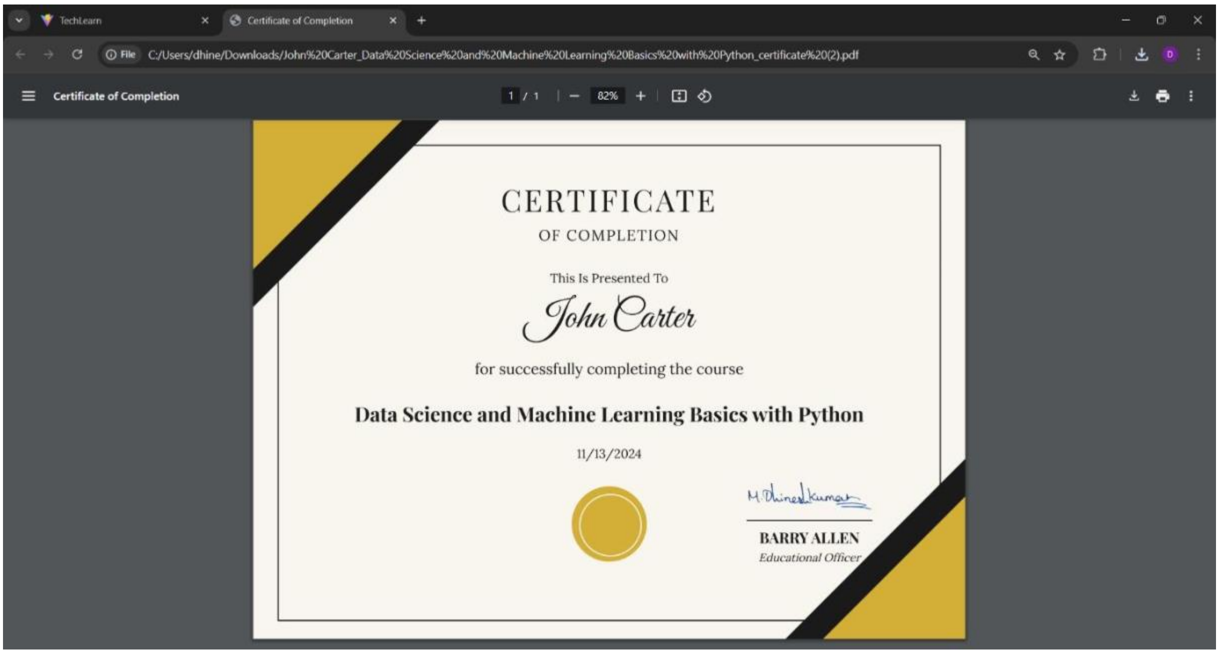
Select a Course

Full-Stack Development with the MERN Stack

Discussion Thread for Full-Stack Development with the MERN Stack

John Carter: It was nice to learn about MERN stack and how to use it for web applications

9. User Certificate



C:/Users/dhine/Downloads/John%20Carter_Data%20Science%20and%20Machine%20Learning%20Basics%20with%20Python_certificate%20(2).pdf

CERTIFICATE

OF COMPLETION

This Is Presented To

John Carter

for successfully completing the course

Data Science and Machine Learning Basics with Python

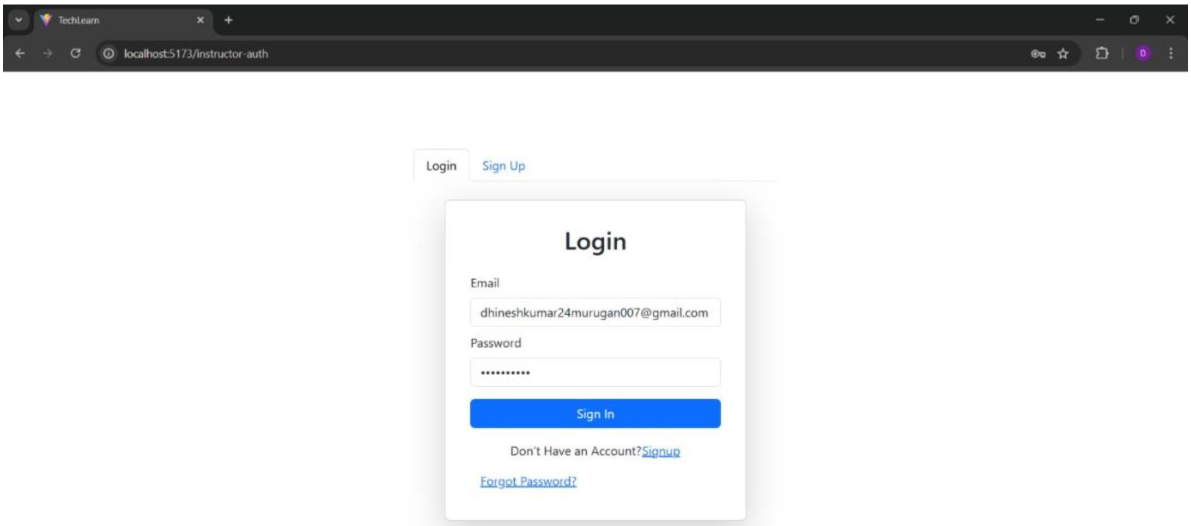
11/13/2024

M.Dhineshkumar

BARRY ALLEN

Educational Officer

10. Instructor Login



localhost:5173/instructor-auth

Login

Email

dhineshkumar24murugan007@gmail.com

Password

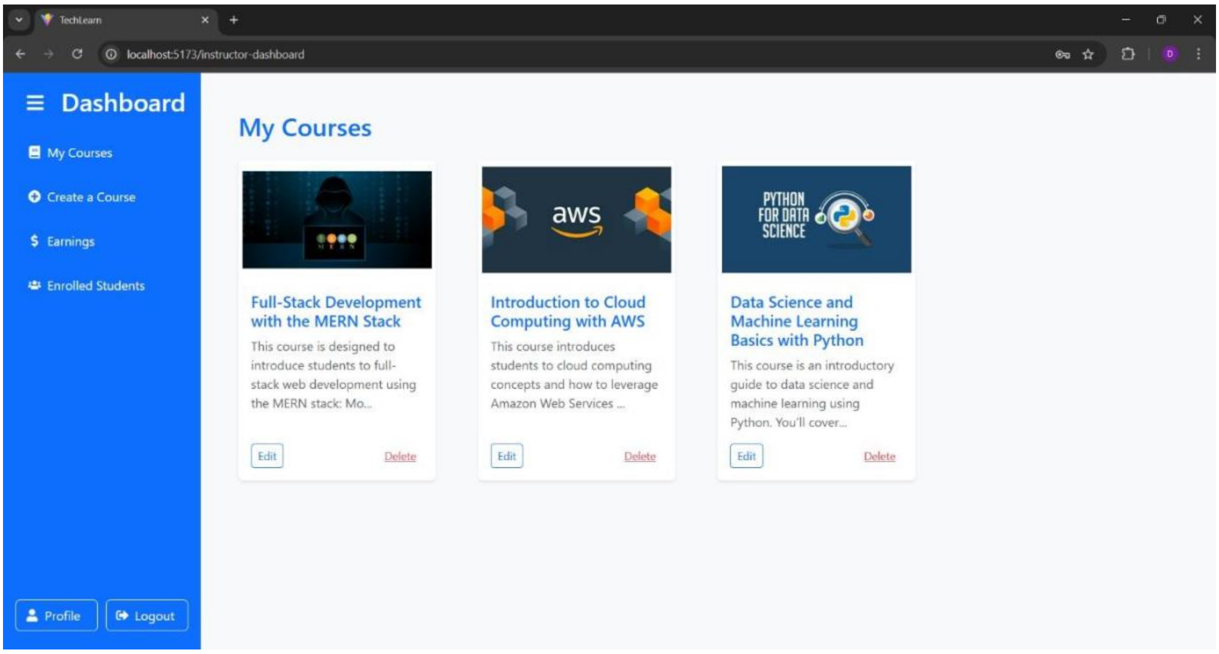
••••••••••

Sign In

Don't Have an Account?Signup

Forgot Password?

11. Instructor Dashboard



My Courses

Full-Stack Development with the MERN Stack

This course is designed to introduce students to full-stack web development using the MERN stack: Mo...

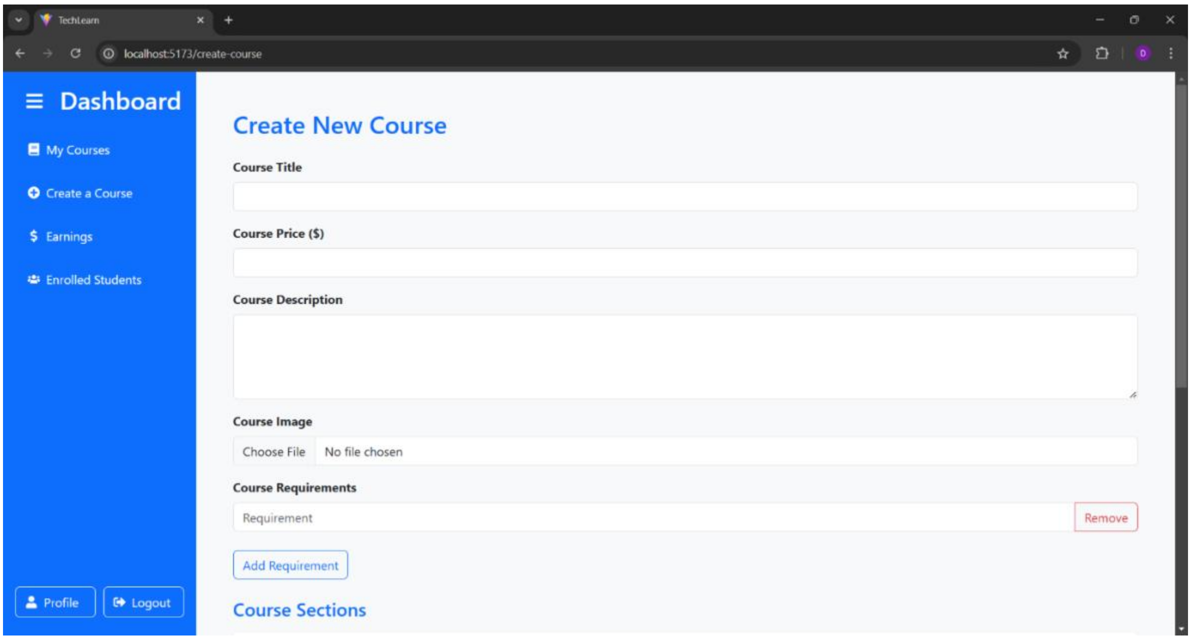
Introduction to Cloud Computing with AWS

This course introduces students to cloud computing concepts and how to leverage Amazon Web Services ...

Data Science and Machine Learning Basics with Python

This course is an introductory guide to data science and machine learning using Python. You'll cover...

12. Instructor Course Creation



Create New Course

Course Title

Course Price ($)

Course Description

Course Image

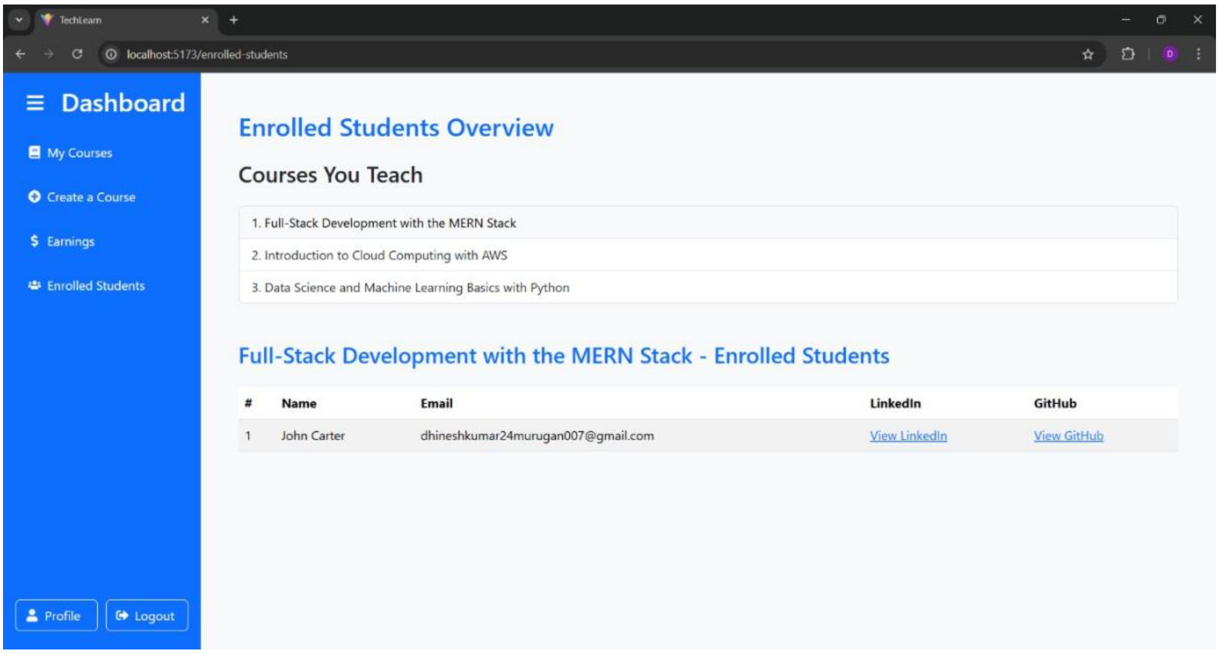
No file chosen

Course Requirements

Requirement

Course Sections

13. Instructor Enrolled Students



Enrolled Students Overview

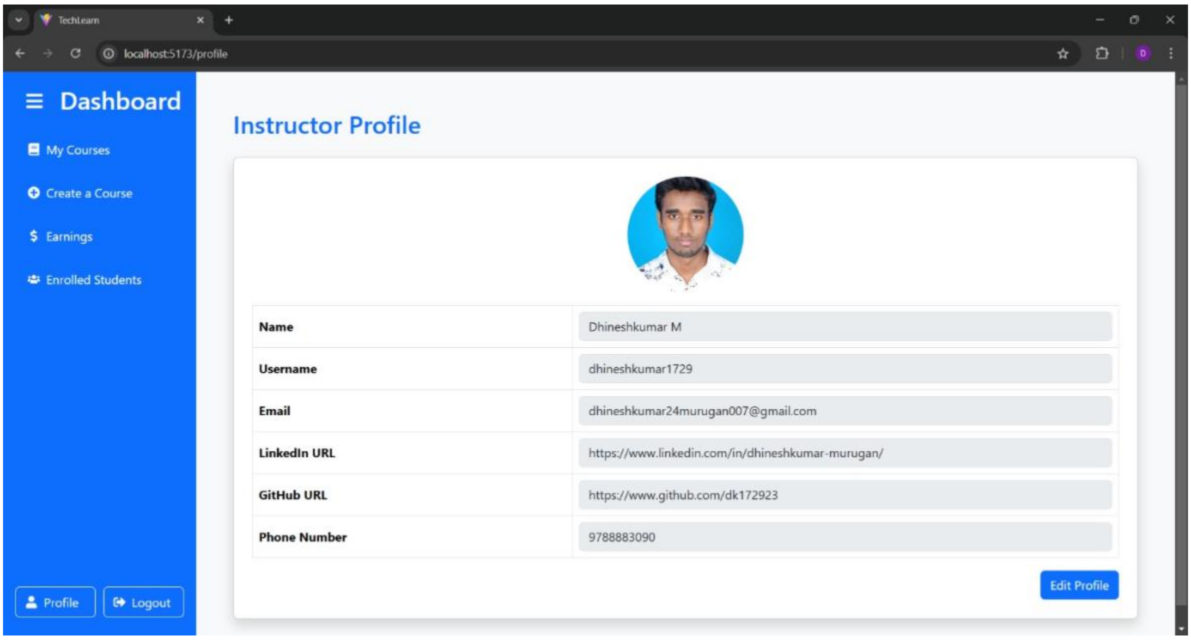
Courses You Teach

1. Full-Stack Development with the MERN Stack
2. Introduction to Cloud Computing with AWS
3. Data Science and Machine Learning Basics with Python

Full-Stack Development with the MERN Stack - Enrolled Students

#	Name	Email	LinkedIn	GitHub
1	John Carter	dhineshkumar24murugan007@gmail.com	View LinkedIn	View GitHub

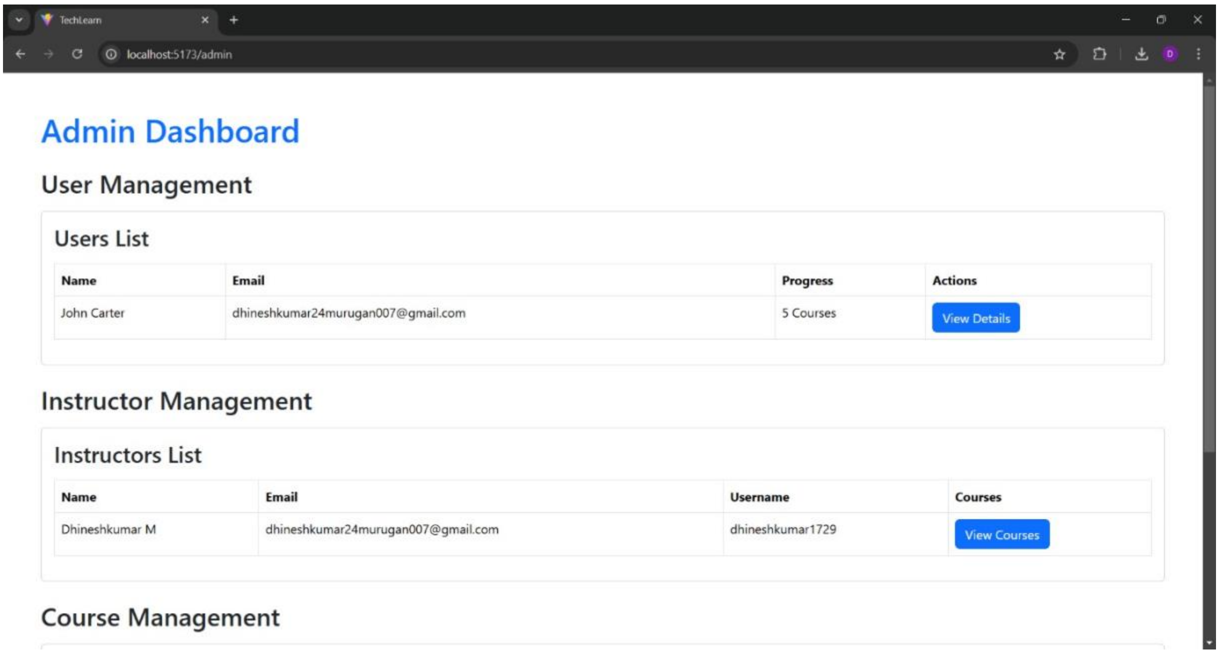
14. Instructor Profile Page



Instructor Profile

Name	Dhineshkumar M
Username	dhineshkumar1729
Email	dhineshkumar24murugan007@gmail.com
LinkedIn URL	https://www.linkedin.com/in/dhineshkumar-murugan/
GitHub URL	https://www.github.com/dk172923
Phone Number	9788883090

15. Admin Dashboard – 1



Admin Dashboard

User Management

Users List

Name	Email	Progress	Actions
John Carter	dhineshkumar24murugan007@gmail.com	5 Courses	View Details

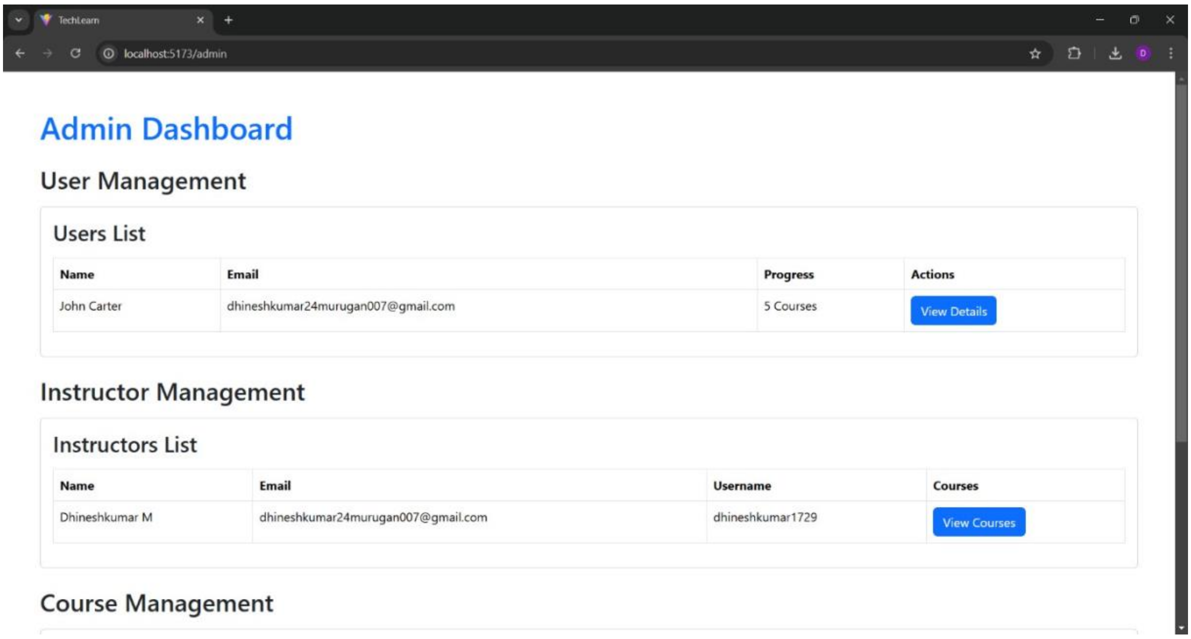
Instructor Management

Instructors List

Name	Email	Username	Courses
Dhineshkumar M	dhineshkumar24murugan007@gmail.com	dhineshkumar1729	View Courses

Course Management

16. Admin Dashboard – 2



Admin Dashboard

User Management

Users List

Name	Email	Progress	Actions
John Carter	dhineshkumar24murugan007@gmail.com	5 Courses	View Details

Instructor Management

Instructors List

Name	Email	Username	Courses
Dhineshkumar M	dhineshkumar24murugan007@gmail.com	dhineshkumar1729	View Courses

Course Management

Known Issues

- Admin lacks a dedicated login functionality but only a route.
- No robust error handling for invalid uploads.
- No payment since, the instructor of the course, told us not to include any payment gateway.
- Doesn’t fetch the image, video names while editing the profile or courses.

Future Enhancements

- Add payment gateway for course enrollment.
- Implement advanced analytics for admin insights.
- Include a recommendation engine for personalized course suggestions.
- Integrate WebRTC for live webinars