

# Online Learning Platform using MERN

## 1. Abstract

This project report presents an Online Learning Platform – LearnHub designed to enable flexible, accessible education for students while providing instructors with a robust set of tools to manage courses. The OLP offers login and course management for instructors, course enrollment and certification for students, and an admin console for overall oversight. Developed with React, Bootstrap, Express, and Node, the platform integrates secure access, video storage via Cloudinary, and email notifications using Nodemailer.

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## 2. Introduction

- **Purpose of the Platform:** The purpose of the OLP is promoting accessible, flexible, and high-quality online learning.
  - **Problem Statement:** The platform addresses the need for an integrated learning environment where students and instructors can interact, share knowledge, and track learning progress in a secure, user-friendly application.
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## 3. Key Features of the Online Learning Platform

### 1. User Roles and Access Control

- **Instructor:** Instructors can log in, create and manage courses, and view enrolled students.
- **Student:** Students can sign up, view courses, enroll, track progress, and receive certifications.
- **Admin:** The Admin has access to student and instructor data, can view course listings, and manage platform content.

### 2. Instructor Functionalities

- **Course Creation:** Instructors can create courses with banner images, prerequisites, and multiple sections.

- **Content Upload:** Video content is stored on Cloudinary, optimizing media management and streaming.
- **Student Management:** Instructors can view the list of students enrolled in each course, facilitating student monitoring and engagement.
- **Course Management:** Instructors can edit and delete courses, ensuring the platform remains updated and relevant.

### 3. Student Functionalities

- **Course Exploration and Enrollment:** Students can browse available courses, view course details, and enroll in courses.
- **Course Progress and Certification:** Upon course completion, students are presented with a certificate that includes their name, course name, and date of issue.
- **Discussion Forum:** Each course includes a discussion section where students can initiate or join threads, fostering a collaborative learning environment.
- **Profile Management:** Students can edit their profile data, enhancing personalization within the platform.

### 4. Admin Console

- **User Management:** Admins can view detailed profiles of students and instructors.
  - **Course Oversight:** Admins can monitor all courses' basic details and delete any course that violates platform policies or becomes obsolete.
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## 4. Technical Architecture

### 1. Frontend

- **Framework:** React is used for building a responsive and interactive user interface.
- **UI Components:** Bootstrap is used alongside custom CSS to create a user-friendly and visually appealing interface.

- **Protected Routes:** All sensitive pages are protected using JWT tokens to ensure secure access control.

## 2. Backend

- **Framework:** Node.js and Express handle server-side logic, API integration, and secure communication between client and server.
- **Authentication and Security:** JWT tokens are used for authentication, ensuring that only authorized users can access protected routes.
- **File and Media Storage:** Cloudinary is integrated to store video files, enabling efficient media handling for course sections.
- **Email Integration:** Nodemailer is used to send email notifications, including password recovery and account verification.

## 3. Database

- **Database Choice:** MongoDB Atlas is chosen for scalable and efficient storage of user data, course content, and progress tracking.
  - **Data Structure:** Data models are designed for students, instructors, and admin roles to manage unique functionalities, along with a course schema to handle multiple sections, student enrollments, and progress.
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## 5. Workflow

### 1. Instructor Workflow

- Login -> Create/Edit/Delete Course -> Upload Videos via Cloudinary -> Manage Enrollments.

### 2. Student Workflow

- Signup/Login -> Browse Courses -> Enroll -> Complete Course -> Obtain Certificate.

### 3. Admin Workflow

- Login -> Monitor User and Course Activity -> Remove Content as Necessary.

## 6. Security Measures

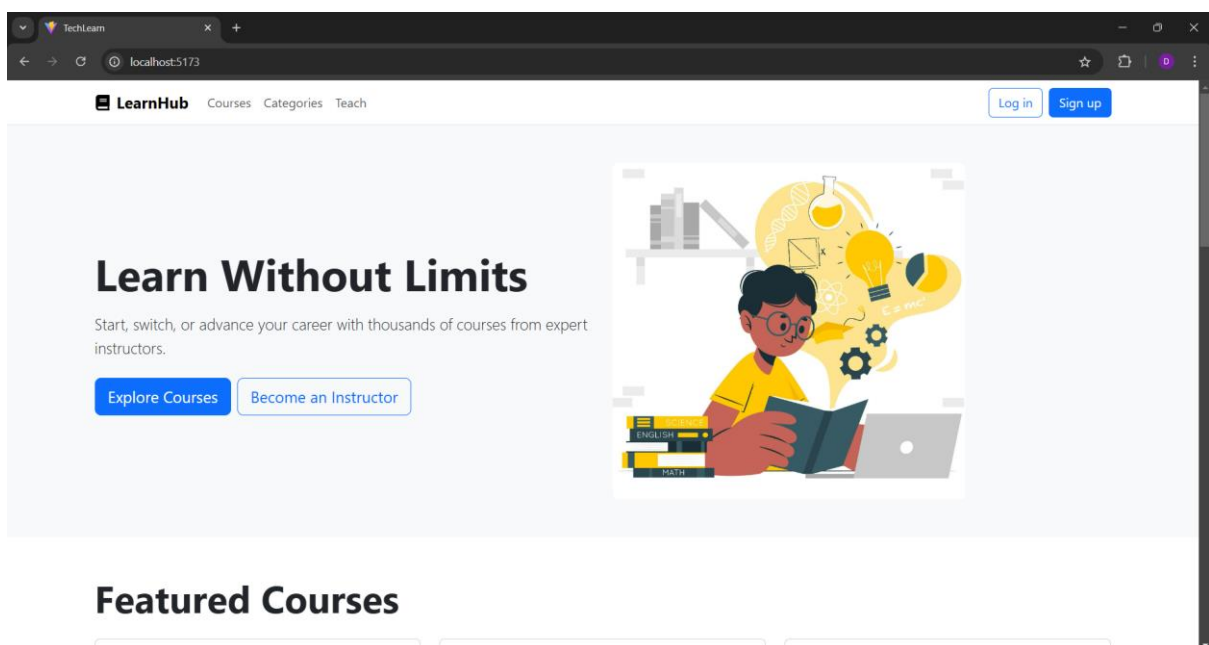
- **JWT Tokens:** Used for secure session management and to protect sensitive routes.
  - **Password Hashing:** User passwords are securely hashed before storage to enhance account security.
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## 8. Future Scope

- Potential integration of a payment gateway for premium courses.
  - Addition of live class features using WebRTC or similar streaming technologies.
  - Enhanced analytics for instructors and admins to track engagement metrics.
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## Output Screenshots

### 1. Landing Page



## 2. Instructor Login



[Login](#) [Sign Up](#)

### Login

Email

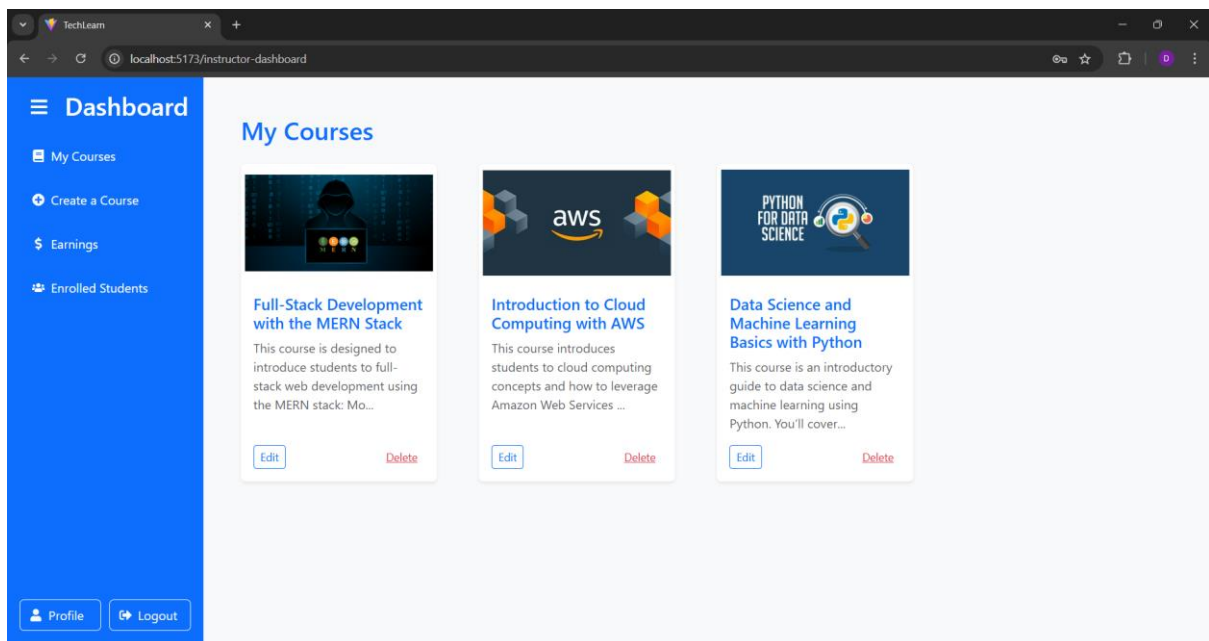
Password

[Sign In](#)

Don't Have an Account? [Signup](#)

[Forgot Password?](#)

## 3. Instructor Dashboard



## 4. Course Creation

The screenshot shows the 'Create New Course' page in the TechLearn dashboard. The left sidebar contains a 'Dashboard' menu with options: 'My Courses', 'Create a Course', 'Earnings', and 'Enrolled Students'. At the bottom of the sidebar are 'Profile' and 'Logout' buttons. The main content area is titled 'Create New Course' and includes the following fields:

- Course Title:** A text input field.
- Course Price (\$):** A text input field.
- Course Description:** A large text area.
- Course Image:** A file upload field with the text 'Choose File' and 'No file chosen'.
- Course Requirements:** A section with a 'Requirement' input field and a 'Remove' button. Below it is an 'Add Requirement' button.
- Course Sections:** A heading for the next section.

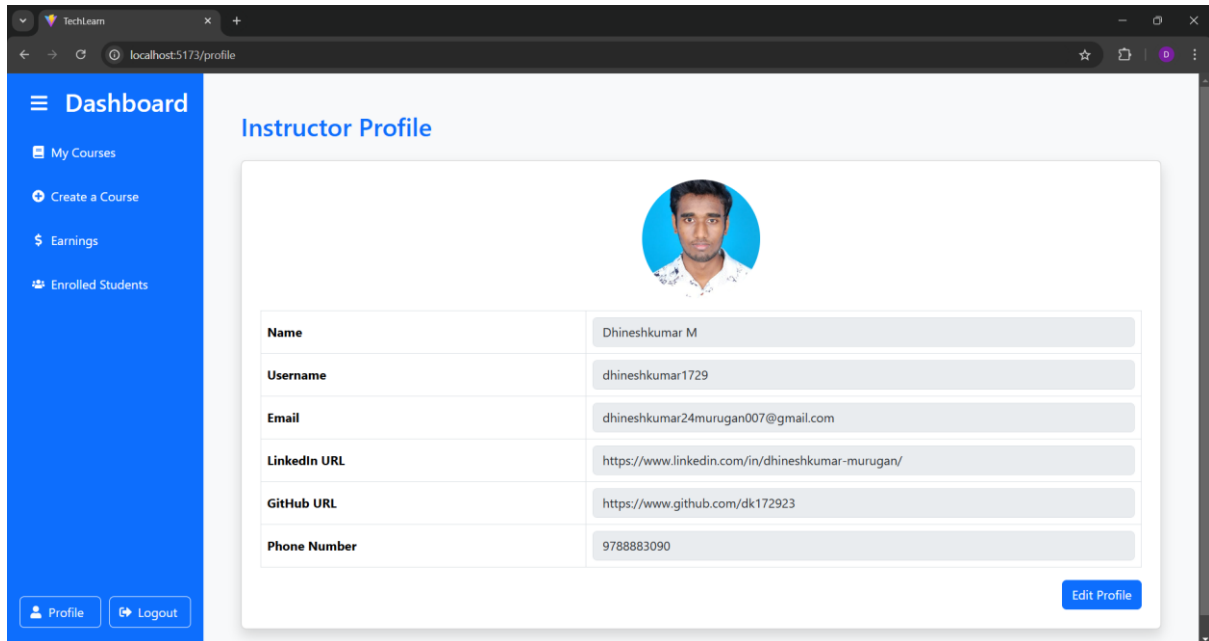
## 5. Enrolled Students

The screenshot shows the 'Enrolled Students Overview' page in the TechLearn dashboard. The left sidebar is identical to the previous page. The main content area is titled 'Enrolled Students Overview' and includes the following sections:

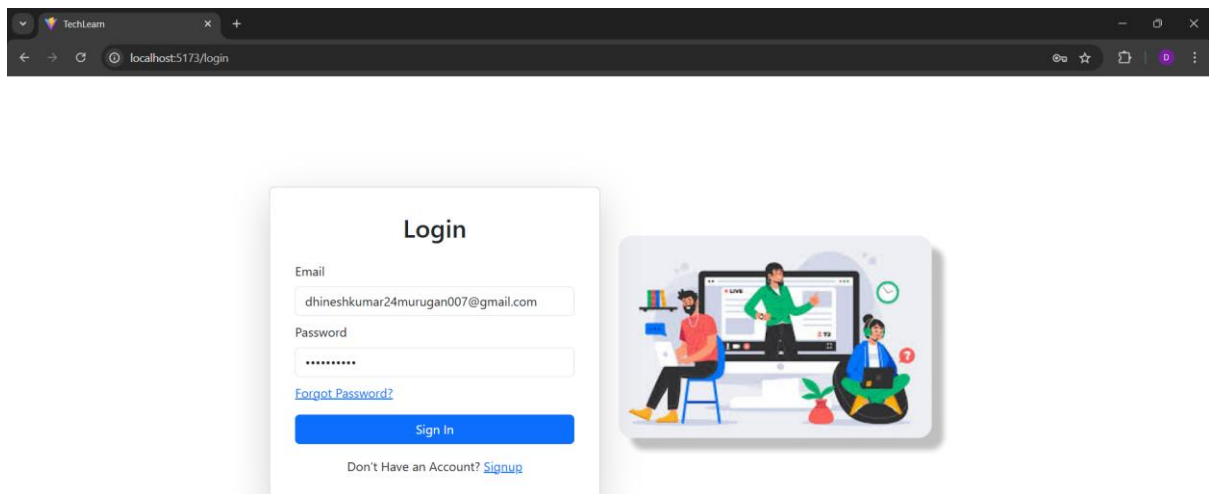
- Courses You Teach:** A list of three courses:
  1. Full-Stack Development with the MERN Stack
  2. Introduction to Cloud Computing with AWS
  3. Data Science and Machine Learning Basics with Python
- Full-Stack Development with the MERN Stack - Enrolled Students:** A table showing enrolled students for this course.

#	Name	Email	LinkedIn	GitHub
1	John Carter	dhineshkumar24murugan007@gmail.com	<a href="#">View LinkedIn</a>	<a href="#">View GitHub</a>

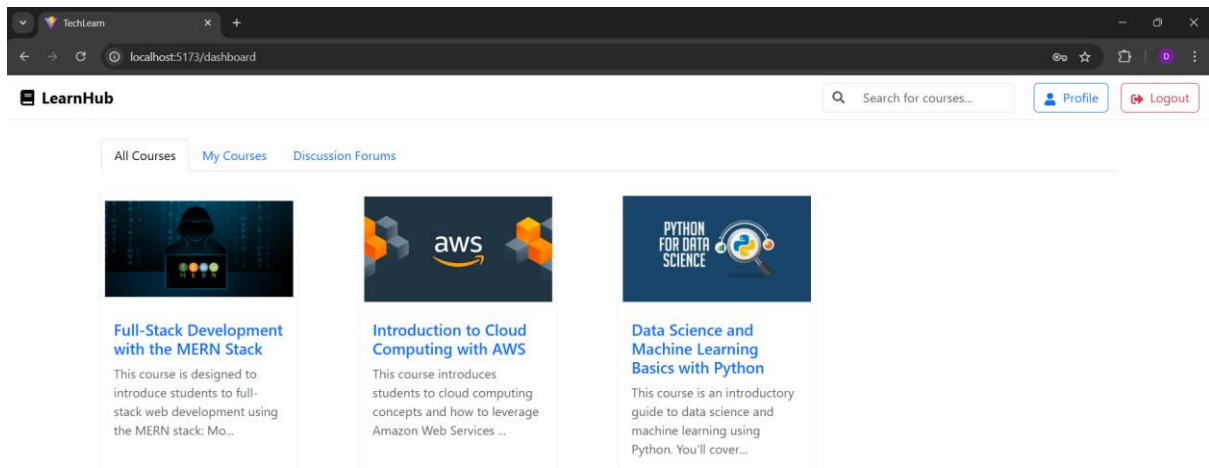
## 6. Profile Page



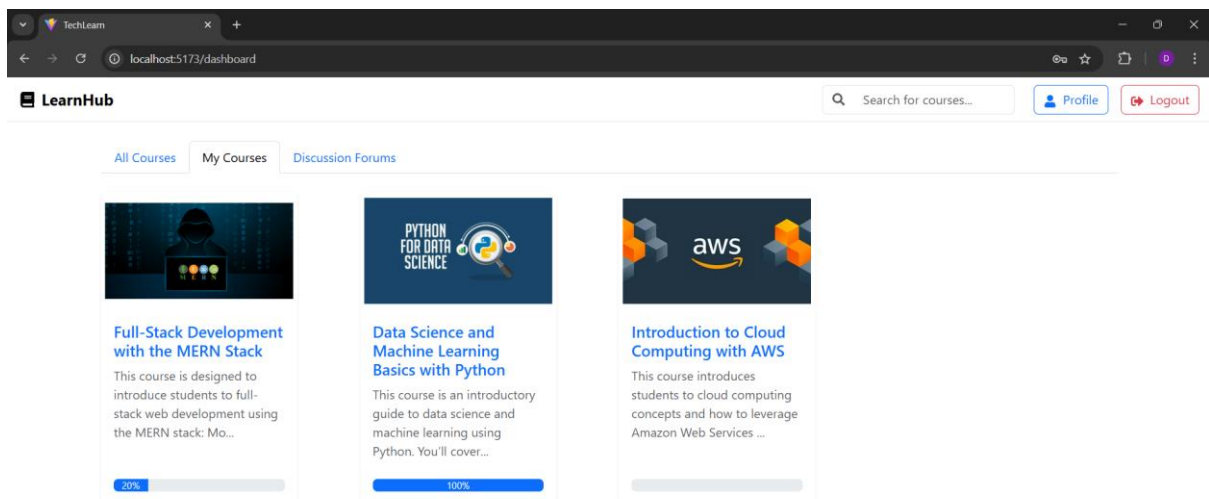
## 7. Student Login



## 8.Student Dashboard – All courses tab



## 9. My courses Tab





## 10. Course Details Page

The screenshot shows the 'Full-Stack Development with the MERN Stack' course page on the LearnHub website. The page features a dark header with the LearnHub logo, a search bar, and user profile/logout links. The main content area has a dark background with a large title, a description of the course, and a 'Created by Dhineshkumar M' section. A prominent white box displays the price '₹19.00', an 'Enrolled' button, and a '30-Day Money-Back Guarantee'. Below this, there are two sections: 'Requirements' (listing HTML, CSS, JavaScript, web development concepts, and Node.js) and 'Instructor' (Dhineshkumar M, Course Instructor).

**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

## 11. Course Accessed Page

The screenshot shows the 'Introduction to Data Science and Python Libraries' course page on the LearnHub website. The page features a light header with the LearnHub logo, a search bar, and user profile/logout links. The main content area has a light background with a large title, a 'Completed' status, and a video player. A green box with a 'Download Certificate' button is overlaid on the video player. The left sidebar shows the 'Course Content' section with a progress bar and a list of topics.

**Introduction to Data Science and Python Libraries**

Completed

**Congratulations!** 🎉  
You have completed this course. Great job!

Download Certificate

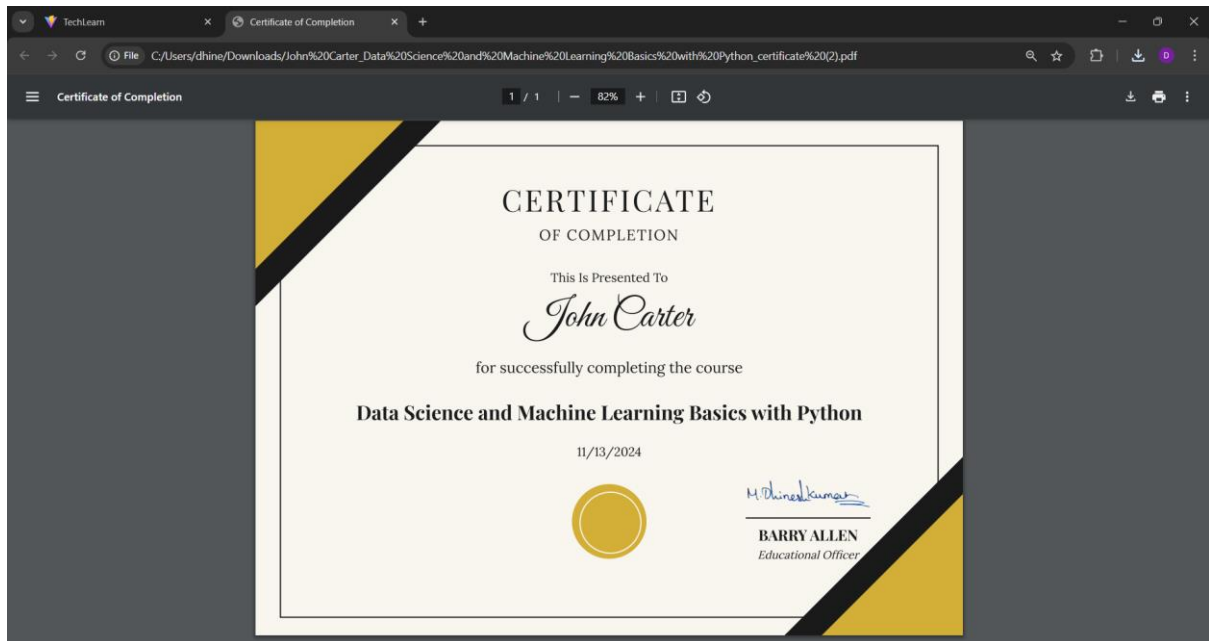
0:00 / 2:38

**Course Content**

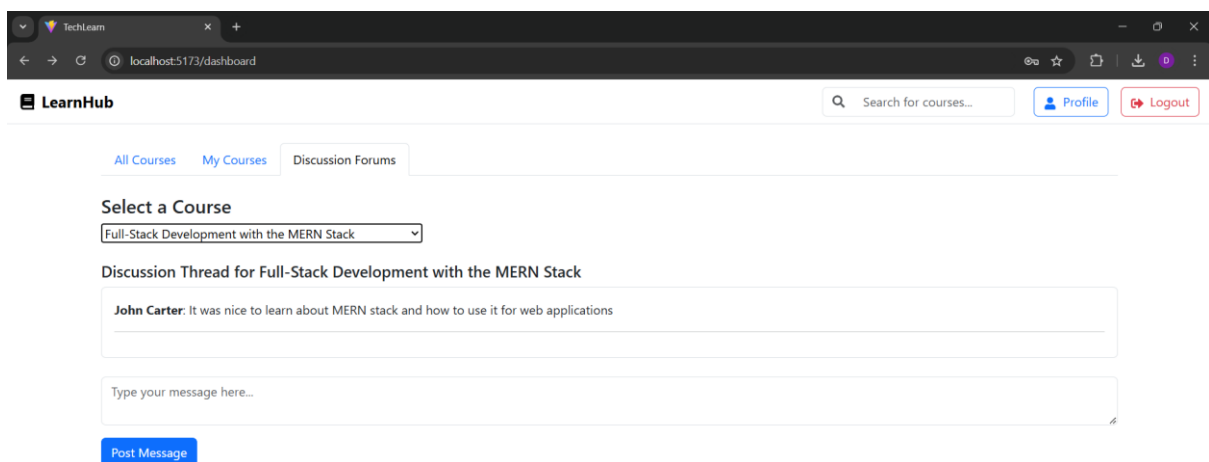
100% complete

- 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

## 12. Certificate Download



## 12. Discussion Page



## 13. Student Profile Page

The screenshot shows the 'Student Profile' page in a web browser. The browser's address bar displays 'localhost:5173/student-profile'. The page header includes the 'LearnHub' logo, a search bar with the placeholder 'Search for courses...', and links for 'Profile' and 'Logout'. The main content area features a circular profile picture of a man with a beard. Below the picture is a table containing the following information:

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

An 'Edit Profile' button is located at the bottom right of the profile information box.

## 14. Admin Dashboard

The screenshot shows the 'Admin Dashboard' page in a web browser. The browser's address bar displays 'localhost:5173/admin'. The page header includes the 'LearnHub' logo, a search bar with the placeholder 'Search for courses...', and links for 'Profile' and 'Logout'. The main content area is divided into three sections:

### User Management

**Users List**

Name	Email	Progress	Actions
John Carter	dhineshkumar24murugan007@gmail.com	5 Courses	<a href="#">View Details</a>

### Instructor Management

**Instructors List**

Name	Email	Username	Courses
Dhineshkumar M	dhineshkumar24murugan007@gmail.com	dhineshkumar1729	<a href="#">View Courses</a>

### Course Management



## Instructor Management

### Instructors List

Name	Email	Username	Courses
Dhineshkumar M	dhineshkumar24murugan007@gmail.com	dhineshkumar1729	<a href="#">View Courses</a>

## Course Management

### Courses List

Title	Instructor	Price	Actions
Full-Stack Development with the MERN Stack	dhineshkumar24murugan007@gmail.com	19	<a href="#">Delete</a>
Introduction to Cloud Computing with AWS	dhineshkumar24murugan007@gmail.com	45	<a href="#">Delete</a>
Data Science and Machine Learning Basics with Python	dhineshkumar24murugan007@gmail.com	67	<a href="#">Delete</a>