LearnHub - Skill Elevation Through Online Learning

Project Introduction

LearnHub is a modern Online Learning Platform (OLP) built to provide a seamless educational experience to learners, instructors, and administrators. This documentation outlines the platform's structure, features, flow, and architecture.

Core Functional Highlights

- Simple and Responsive UI: Supports all devices with accessible design.

- Efficient Course Lifecycle: Instructors manage content; students enroll and learn.

- Community Engagement: Real-time chat, forums, webinars.

- Progress and Certification: Track and generate downloadable certificates.

- Flexible Learning: Self-paced access anytime.

- Secure Payments: Free & paid content with gateway integration.

Use Case: Sarah?s Journey

1. Registration: Sarah signs up with email and password.

2. Explore Courses: Chooses "Web Development Fundamentals".

3. Enrollment: Reviews and clicks "Enroll".

4. Start Learning: Watches videos, quizzes, reads.

5. Community: Joins discussions.

6. Completion: Passes exam, downloads certificate.

7. Paid Course: Purchases premium content.

Teacher John uploads courses. Admin manages system.

System Architecture

Frontend: React.js + Vite + Bootstrap + Material UI

Backend: Node.js + Express.js + MongoDB

APIs: RESTful using Axios

- Vite for fast builds

- MongoDB for data storage

- Express.js for routing/middleware

Database Schema (ER Diagram)

Users (_id, name, email, password, type)

Courses (_id, userID, educator, categories, title, description, sections, price, enrolled)

Tech Stack Prerequisites

- Node.js: https://nodejs.org/en/download/

- Express.js: npm install express

- MongoDB: https://www.mongodb.com/try/download/community

- React.js: https://reactjs.org/docs/create-a-new-react-app.html

- UI: Material UI, Bootstrap, AntD, mdb-react-ui-kit

- Vite: npm create vite@latest

Installation Guide

cd containment-zone

cd frontend

npm install

cd ../backend

npm install

npm start

Access: http://localhost:5172

Directory Structure

Frontend: src/components/, pages/, App.jsx, main.jsx

Backend: controllers/, routes/, middleware/, models/, index.js

Role-Based Features

Student Panel: View/enroll courses, download certificates.

Teacher Panel: Manage course content.

Admin Dashboard: Monitor users, approve/remove courses, analytics.

Backend Development

.env for PORT, DB_URL, JWT_KEY

Install: cors, bcryptjs, express, dotenv, mongoose, multer, jsonwebtoken, nodemon

Middleware: authMiddleware.js

Schema: in /models

Frontend Development

React + Bootstrap + Material UI + Axios

Component layout: landing, login, dashboard, etc.

Final Testing & Review

Launch both frontend and backend

Simulate user journeys

Validate course operations, payments, certificates

Screenshots and Visuals

- Landing Page

- Login/Registration

- Student, Teacher, Admin Dashboards

- Certificate Download Page

Conclusion

LearnHub is a scalable MERN-based education platform with responsive UI, efficient backend, and secure data systems. Ideal for institutions and educators.

Expandable. Customizable. Scalable.