

Capstone Project Report: EduVerse E-Learning Portal

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1. Project Introduction

1.1. Objective

The primary objective of this capstone project, as per Task 5 of the internship, was to independently design, build, and deploy a professional-grade web application to showcase industry readiness. The "E-learning Portal" (EduVerse) was selected for this task.

1.2. Project Overview

EduVerse is a full-stack, database-driven E-learning platform. It provides a complete portal for students to register, browse courses, and manage their learning, while also providing a full administrative backend for site management, user tracking, and analytics.

1.3. Technologies Used

- **Frontend:** HTML5, Tailwind CSS, JavaScript (ES6+)
- **Backend:** PHP
- **Database:** MySQL
- **Key Libraries:**
 - **PHPMailer:** For sending transactional emails (Email OTP verification).
 - **Chart.js:** For rendering analytics charts on the admin dashboard.
- **Tools & Deployment:**
 - **Git & GitHub:** For version control.
 - **Composer:** For managing PHP dependencies (PHPMailer).
 - **InfinityFree:** For live hosting of the web application and database.
 - **GitHub Actions:** For establishing a CI/CD pipeline for live updates via FTP.

2. Key Features Implemented

This project includes a wide range of features for both students and administrators.

2.1. Secure Authentication System

- **User Registration:** New users can create an account. Passwords are secured in the database using `password_hash()`.
- **Email OTP Verification:** A 6-digit One-Time Password is sent to the user's email via PHPMailer. The user must enter this OTP to verify their account.
- **Secure Login:** The login system checks for a correct password (`password_verify()`) and confirms that the user's account is_verified.
- **Role-Based Access:** The system differentiates between 'student' and 'admin' roles, showing the correct dashboard and links for each.

2.2. Student & User Features

- **Course Catalog (Home Page):** Students can view all available courses.
- **AJAX Real-time Search:** A live search bar filters the course catalog in real-time without a page reload.
- **My Dashboard:** A personalized dashboard where students can see only the courses they are enrolled in.
- **User Profile Page:** A dedicated settings page where a user can view their name and email.
- **Change Password:** Users can securely update their password by providing their current password and a new one.
- **Delete Account:** Users can permanently delete their own account. This action is protected by a confirmation modal and, upon confirmation, deletes the user and all their associated data (like enrollments) from the database.

2.3. Administrative Panel

- **Admin-Only Access:** The entire admin dashboard is protected and is only accessible to users with the 'admin' role.
- **Statistics Overview:** The admin homepage features key site statistics (Total Users, Total Courses, Total Enrollments) pulled from the database.
- **Enrollment Analytics (Chart.js):** A dynamic bar chart displays the most popular courses by enrollment count.
- **User Management:** A table view listing all registered users, their IDs, emails, and roles.
- **Course Management:** A table view listing all courses in the database.

3. Database Schema

The database is the core of the application, designed with four relational tables in MySQL to manage all user and course data efficiently.

- **users:** This is the main table for authentication and user data. It stores the user's id, name, email, and securely hashed password. It also contains the complete authentication logic: otp, otp_expiry, and the is_verified (boolean) flag for the

email verification system. The role column (student or admin) enables role-based access control across the site.

- **courses:** This table holds all public information about the courses, including title, category, instructor, description, image, rating, and students (a simple count).
- **lessons:** This table stores the actual content for each course. It is linked to the courses table via a courseId foreign key. Each lesson has a title, a type (video or quiz), and content (a YouTube link for videos or a JSON string for quizzes).
- **enrollments:** This is the crucial "join table" that connects users and courses. It creates a **many-to-many** relationship by linking users.id (as userId) and courses.id (as courseId). This single table allows the application to know which users are enrolled in which courses and even tracks their progress.

The screenshot shows the phpMyAdmin interface with the database 'elearning' selected. The left sidebar lists various databases. The main area shows the structure of four tables:

- elearning lessons:** Contains columns: id (int(11)), coursId (int(11)), position (int(11)), userId (int(11)), coursId (int(11)), type (enum('video','quiz')), progress (int(11)).
- elearning users:** Contains columns: id (int(11)), name (varchar(255)), email (varchar(255)), password (varchar(255)), otp (varchar(6)), otp_expiry (datetime), role (enum('student','admin')), is_verified (tinyint(1)).
- elearning enrollments:** Contains columns: id (int(11)), coursId (int(11)), position (int(11)), userId (int(11)), coursId (int(11)), type (enum('video','quiz')), progress (int(11)).
- elearning courses:** Contains columns: id (int(11)), title (varchar(255)), category (varchar(255)), instructor (varchar(255)), description (text), image (varchar(255)), rating (decimal(2,1)), students (int(11)).

4. Project Screenshots

4.1. Login & Registration

Fig. 1: Login Page

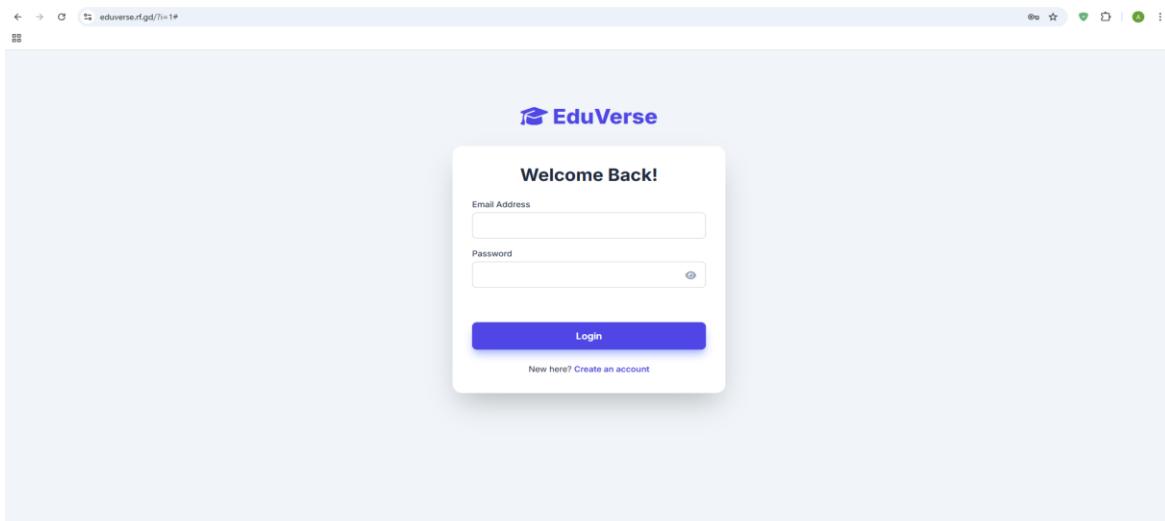


Fig. 2: Registration Page

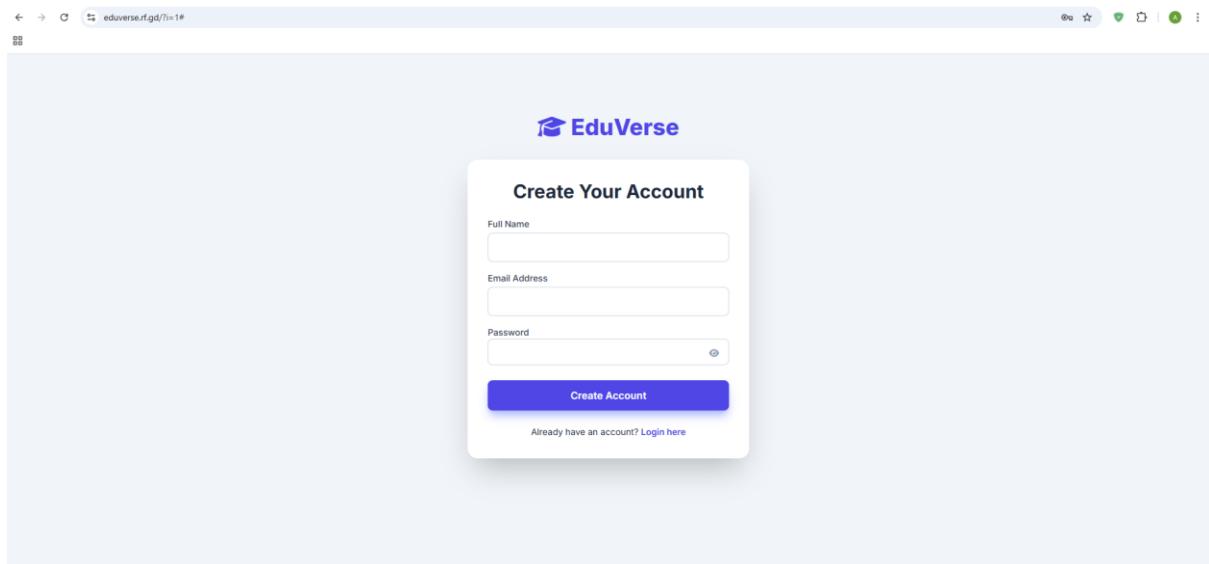
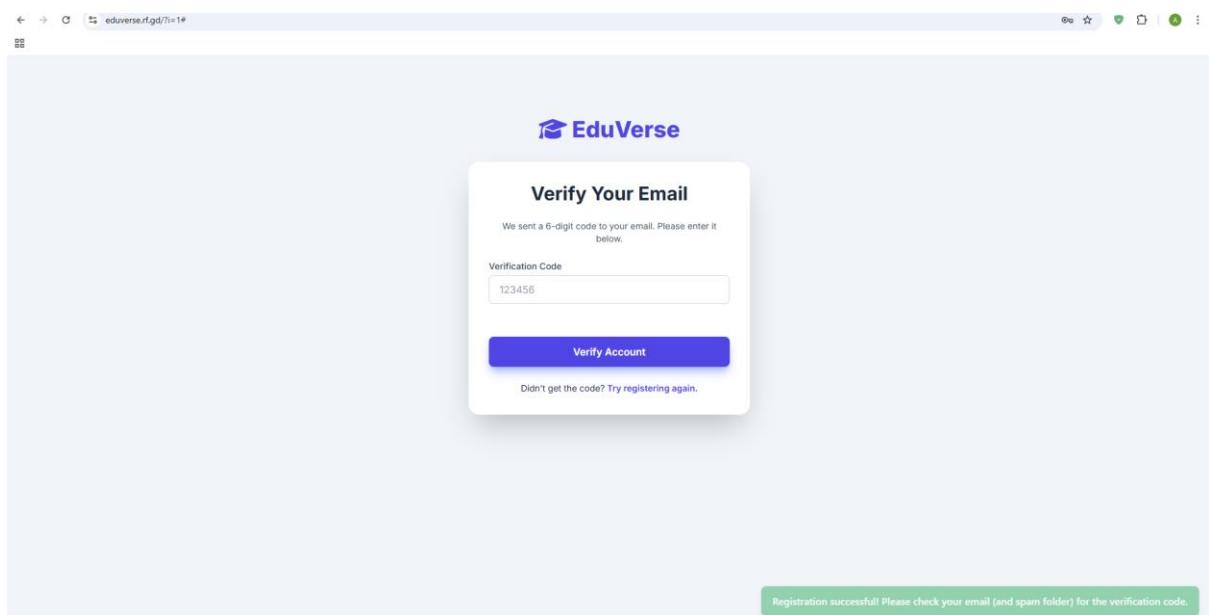


Fig. 3: Email OTP Verification



4.2. Student Dashboard

Fig. 4: Course Catalog (Home)

The screenshot shows the EduVerse course catalog home page. At the top, there is a purple banner with the text "Unlock Your Potential" and a search bar. Below the banner, there is a section titled "Most Popular Courses" featuring four cards: "Web Dev" (purple), "JavaScript" (pink), "Python" (red), and "ML" (green). Each card contains course titles, authors, ratings, and "Enroll Now" buttons.

Category	Course Title	Author	Rating	Action
Web Dev	Introduction to Web Development	Dr. Angela Yu	4.7 ★ (1)	Enroll Now
	Advanced JavaScript Concepts	Brad Traversy	4.9 ★ (0)	Enroll Now
Python	Python for Data Science	Jose Portilla	4.8 ★ (1)	Enroll Now
	Machine Learning Essentials	Andrew Ng	4.9 ★ (1)	Enroll Now

Fig. 5: Student's "My Dashboard"

The screenshot shows the student's "My Dashboard". It features a section titled "My Learning" with two cards: "ML" (green) and "App Dev" (blue). Each card contains course titles, authors, and "Continue Learning" buttons.

Category	Course Title	Author	Action
ML	Machine Learning Essentials	Andrew Ng	Continue Learning
	Mobile App Development	Angela Yu	Continue Learning

4.3. Profile Setting and Security

Fig. 6: Profile Settings Page

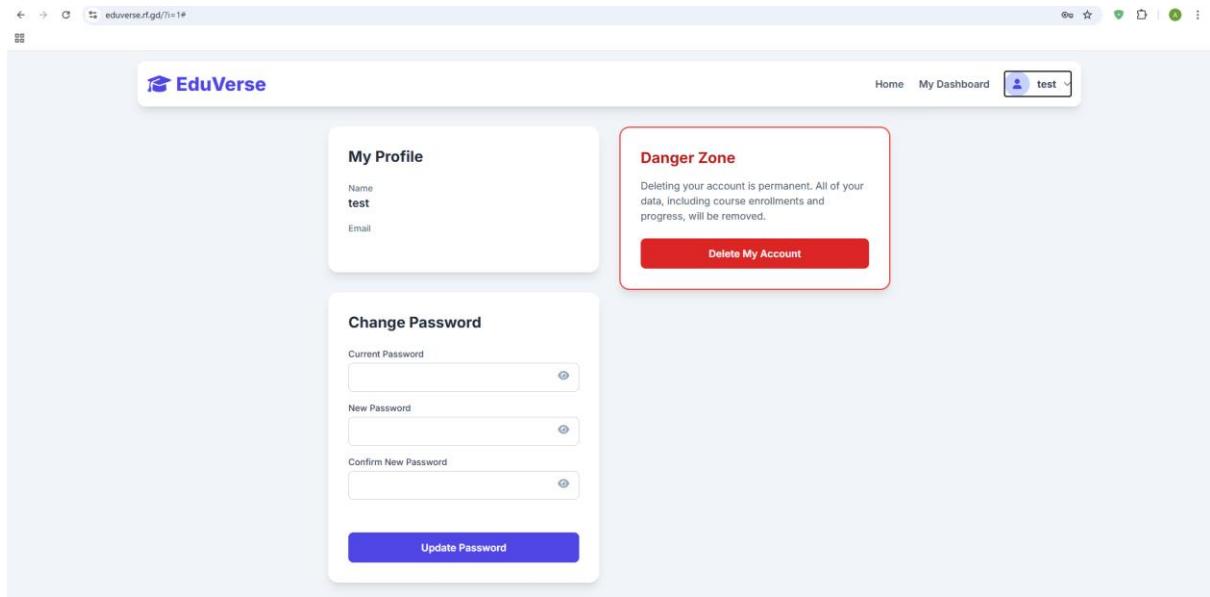
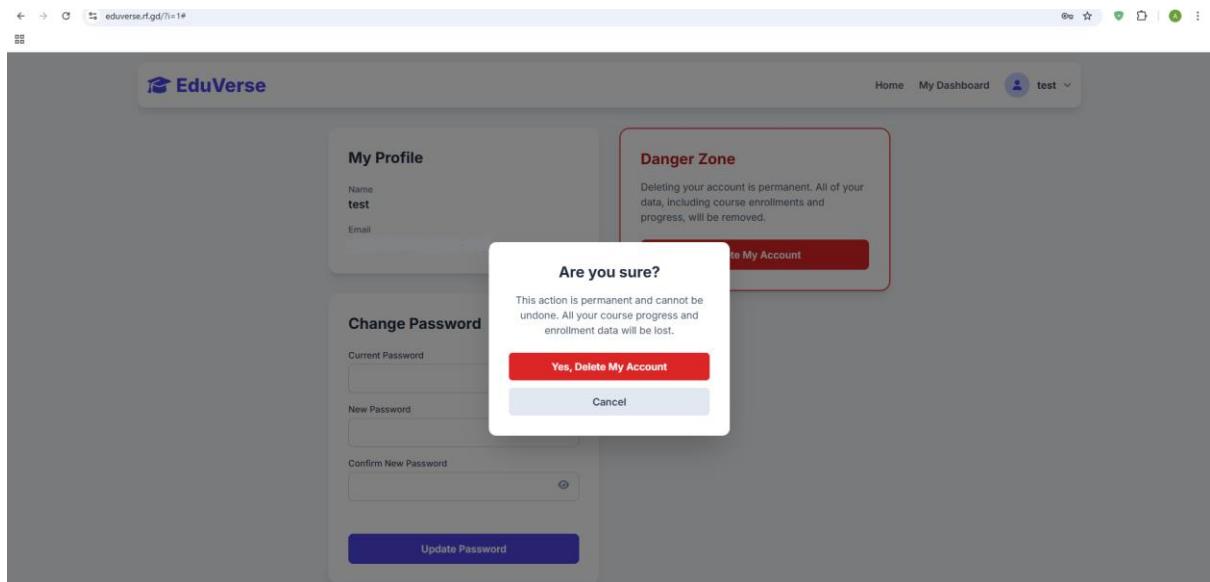


Fig. 7: Delete Account Confirmation



4.4. Admin Panel

Fig. 8: Admin Overview & Analytics

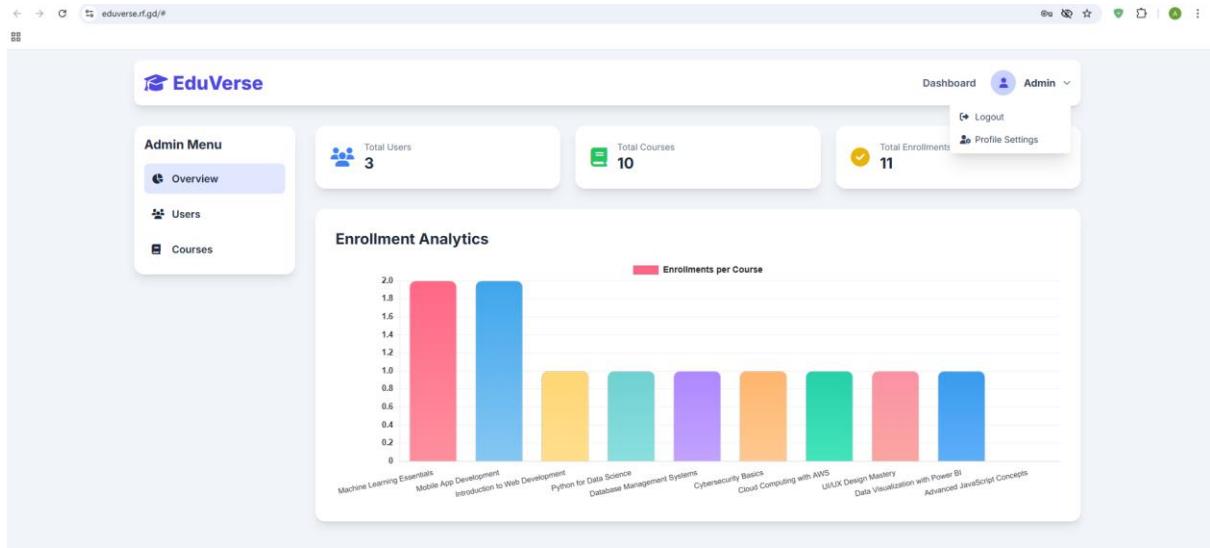
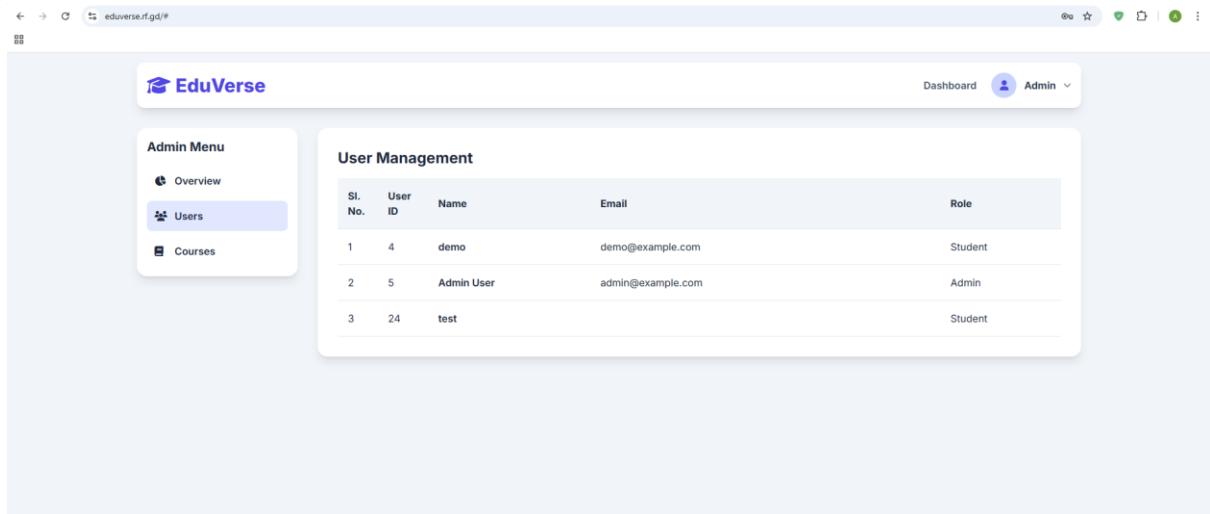


Fig. 9: Admin User Management



5. Deployment & Live Links

5.1. Deployment

The application was successfully deployed to **InfinityFree**, a free web hosting provider. The MySQL database was exported from the local XAMPP environment and imported into the live server via phpMyAdmin.

A secure config.php file (excluded from Git) was created on the server to store live database and email credentials.

5.2. GitHub CI/CD

A **GitHub Actions** workflow (deploy.yml) was established to create a CI/CD (Continuous Integration / Continuous Deployment) pipeline. On every git push to the master branch, the workflow automatically deploys the updated files to the InfinityFree server via FTP, allowing for live, automated updates.

5.3. Live Links

- **Live Hosted Site :-**

<https://eduverse.rf.gd>

- **GitHub Repository :-**

<https://github.com/Arijit-Podder636/elearning website.git>