

# Online Course Management Platform

[GitHub Repository](#)

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# Chapter 1

## Design Schema

The Entity–Relationship (ER) diagram represents the logical structure of the database used in the Online Course Management Platform. It illustrates the key entities, their attributes, and the relationships between them to manage courses, teachers, partner universities, and students.

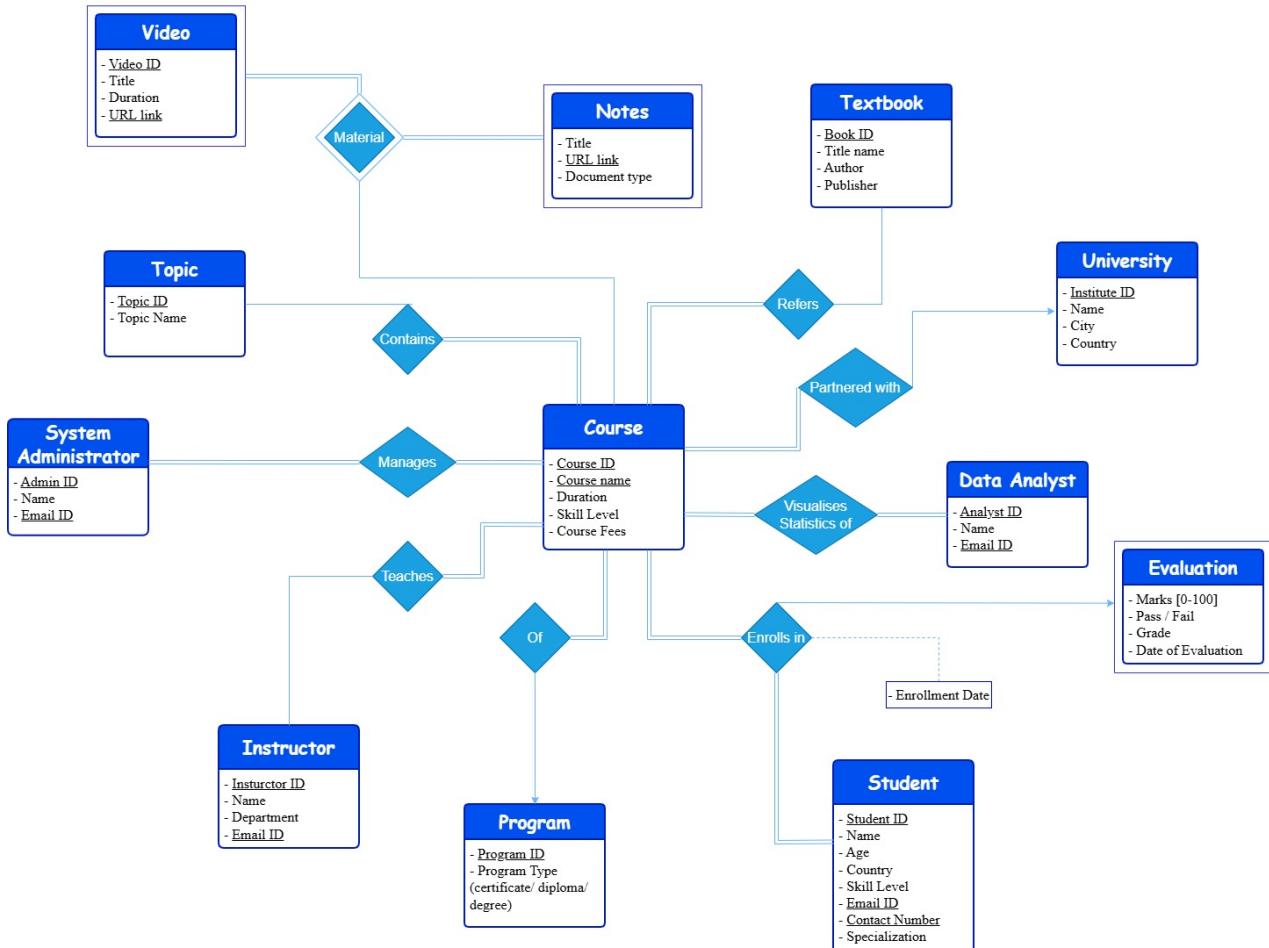


Figure 1.1: Entity-Relationship Diagram

# Chapter 2

## Table Schema

This chapter describes the relational table structure derived from the ER diagram and the SQLAlchemy models. It defines the tables, their attributes, primary keys (PK), and foreign key (FK) relationships used in the database implementation.

Table 2.1: Relational Table Schema of the Online Course Management Platform

Entity / Relation	Attributes
Users	id (PK), full_name, email, hashed_password, role
Course	course_id (PK), course_name, duration, skill_level, course_fees, program_id (FK), institute_id (FK)
Student	student_id (PK), name, dob, country, skill_level, email_id, contact_number, specialization
Instructor	instructor_id (PK), name, department, email_id
Topic	topic_id (PK), topic_name
Program	program_id (PK), program_type
University	institute_id (PK), name, city, country
Video	video_id (PK), title, duration, url_link, course_id (FK)
Notes	notes_id (PK), title, url_link, document_type, course_id (FK)
Textbook	textbook_id (PK), title, author, publisher, course_id (FK, Unique)
Assignment	assignment_id (PK), title, description, assignment_url_link, marks, due_date, course_id (FK)
StudentSubmission	submission_id (PK), assignment_id (FK), student_id (FK), submission_url, submitted_at, obtained_marks, status
Evaluation	evaluation_id (PK), marks, pass_fail, grade, date_of_evaluation, student_id (FK), course_id (FK)
SystemAdmin	admin_id (PK), name, email_id
DataAnalyst	analyst_id (PK), name, email_id
Association Tables (Many-to-Many)	
course_topic_link	course_id (FK), topic_id (FK)
course_student_link	course_id (FK), student_id (FK)
course_instructor_link	course_id (FK), instructor_id (FK)

# Chapter 3

# Technology Stack Architecture

This document presents the high-level system architecture illustrating the interaction between the frontend, backend server, and the database.

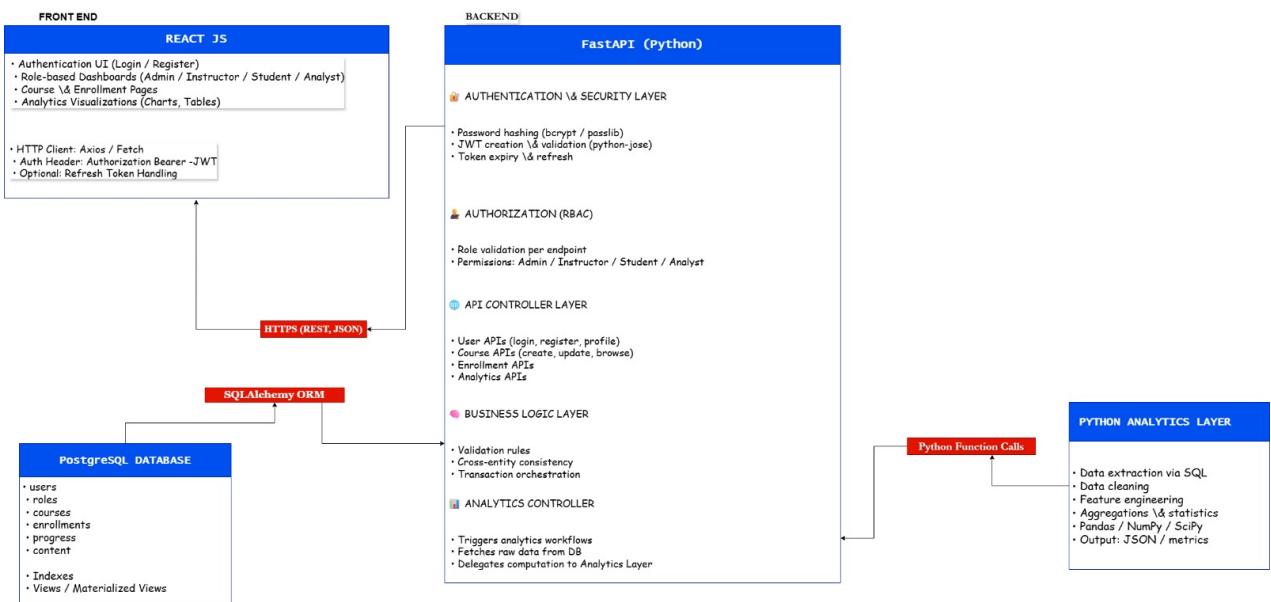


Figure 3.1: TechStack for Online Course Management Platform

## I Technical Architecture and Stack Elaboration

The project is built as a complete web-based information system utilizing a modern decoupled full-stack architecture:

- **Front-end Interface:** Developed using **React.js**, providing a dynamic role-adaptive UI.
- **Connectivity Server:** Powered by **FastAPI**, handling JWT-based authentication and API routing.
- **Database Management:** **SQLAlchemy** ORM manages the database lifecycle and many-to-many transactions.
- **Security:** Implements **JWT** for sessions and **Bcrypt** for secure hashing.

# Chapter 4

## Implementation Details

### I Authentication and Access Control

#### I.I Landing and Home Page

The landing page features core benefits such as diverse courses, expert instructors, and progress tracking.

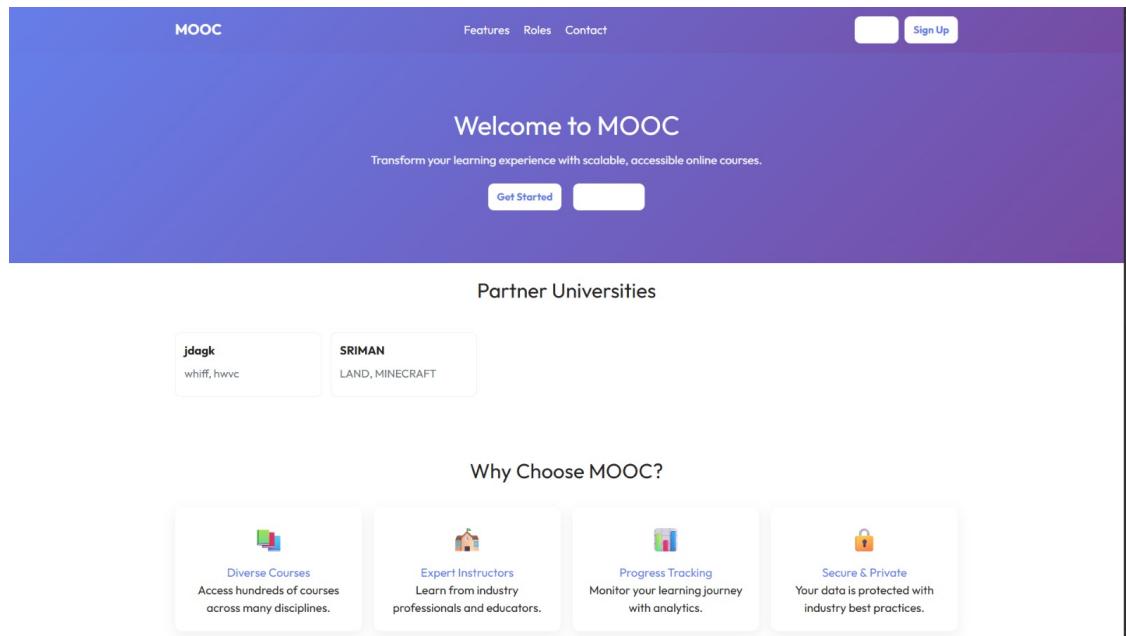


Figure 4.1: MOOC Landing Page

#### I.II Signup and Login

Users register via a form requiring name, email, and password. Instructors, Analysts, and Admins must provide an **Enrollment Key** for verification.

**Create Account**  
Join MOOC and start learning today.

First Name: John  
Last Name: Doe

Email Address: you@example.com

Item #: Student

Enrollment Key (optional): Enter your enrollment key  
Required for certain roles to verify eligibility

Password:

Confirm Password:

**Create Account**

Already have an account? [Sign in here](#)

Figure 4.2: Signup Interface

**Welcome Back**  
Sign in to your MOOC account

Email Address: you@example.com

Password:

[Forgot password?](#)

**Sign In**

or

Google GitHub

Don't have an account? [Sign up here](#)

-- Back to Home

Figure 4.3: Login Interface

## II Student Portal Implementation

### II.I Student Home and Catalog

Students explore available courses via a card-based catalog. Cards display metadata such as duration, skill level, and fees.

**MOOC** Home My Courses

Welcome, a10

Here are your enrolled courses and progress.

Courses Enrolled: 0

**Your Courses**

wyfd No description 78413852 min · wdjgv · \$78613524 <a href="#">View</a> <a href="#">Enroll</a>	fg No description 3254 min · dfgg · \$4263 <a href="#">View</a> <a href="#">Enroll</a>	grew No description 542 min · et · \$537 <a href="#">View</a> <a href="#">Enroll</a>	Sidharth No description 88 min · high · \$999999 <a href="#">View</a> <a href="#">Enroll</a>
SAMBAR No description 234 min · Beginner · \$32423 <a href="#">View</a> <a href="#">Enroll</a>	sjdfh No description 12312 min · Beginner · \$12431324 <a href="#">View</a> <a href="#">Enroll</a>	Kohli No description 87687 min · Beginner · \$89789 <a href="#">View</a> <a href="#">Enroll</a>	

Figure 4.4: Student Home Dashboard and Course Catalog

### II.II My Courses and Profile

Students can filter their enrolled courses using a search bar and manage their personal demographics, specialization, and learning progress through a comprehensive profile view.

**My courses**  
Course overview

Search courses by name or ID

2 : wyfd DURATION: 78413852 SKILL LEVEL: wdjgv COURSE FEE: \$78613524	4 : fg DURATION: 3254 SKILL LEVEL: dfgg COURSE FEE: \$4263
--	---

Figure 4.5: Student Enrollment Overview

**MOOC** Home My Courses

SS s2 x2

Name: s2 x2  
Email (Read): s4@gmail.com  
Date of Birth: 2026-01-14  
Skill level: Beginner

[Edit profile](#)

**Enrolled Courses**

- fg (4)
- grew (3)
- Kohli (3)

Figure 4.6: Student Personal Profile

## III Instructor Portal Implementation

### III.I Teaching and Content Management

Instructors monitor professional metrics like gross earnings and manage hierarchical curricula consisting of videos, notes, and assessments.

Welcome, aaaa6  
Manage your courses and track your earnings.

**Earnings**

GROSS EARNINGS	\$0.00
PER COURSE	\$0.00

"Teaching is the one profession that creates all other professions." - Unknown

Figure 4.7: Instructor Dashboard

MOOC Home Teaching

**DBMS Theory and Lab**

Content Details Students Enrolled

General Announcements Materials Assignments Assessments

Confirm deletion of Video

No Yes

\*Teaching is the one profession that creates all other professions." - Unknown

Add Course

Figure 4.8: Curriculum Management

### III.II Evaluation

The portal provides detailed modal interfaces for reviewing student submissions and assigning grades across all course assignments.

Distributed Hash Tables

Aisha Patel - Distributed Hash Tables

General Course Announcements

Materials DHT Architecture Videos

Assignments DHT Implementation Project

Assessments Quiz 1 P2P Concepts

Grades

Assignment/Assessment	Score	Status
DHT Implementation Project	0	Not Graded
Consistency Protocol Design	0	Not Graded
Performance Analysis Report	0	Not Graded
Quiz 1 P2P Concepts	0	Not Graded
Midterm Exam	0	Not Graded
Final Project Presentation	0	Not Graded

Save Grades Close

Figure 4.9: Student Evaluation Interface

## IV Administrator Portal Implementation

The System Administrator manages the structural integrity and user lifecycle of the platform.

### IV.I Admin Dashboard and Quick Access

The landing page for administrators provides a global overview of platform activity including counts for Courses, Students, Instructors, and partner Universities.

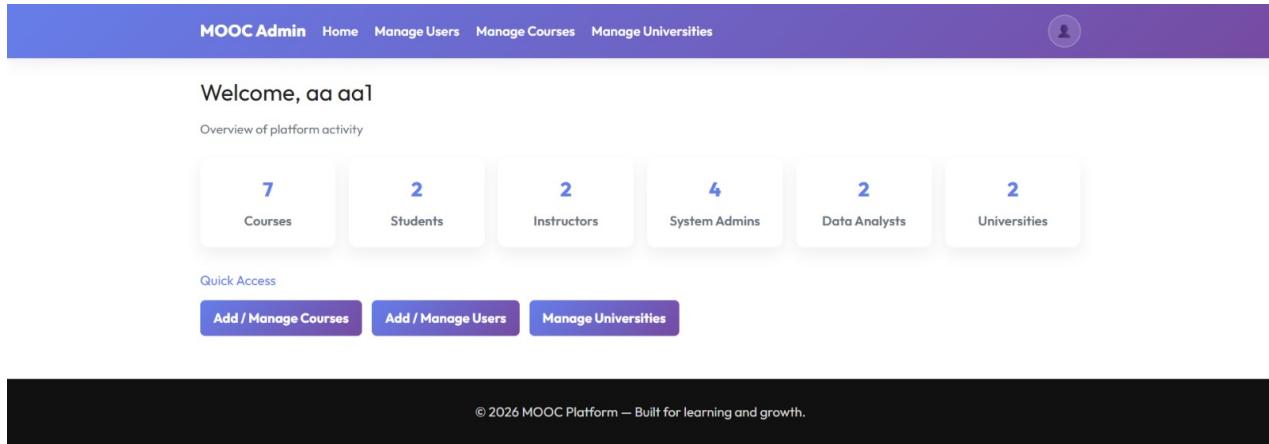


Figure 4.10: System Administrator Activity Dashboard

## IV.II User and Resource Management

Admins have authority to manage user accounts, register partner universities, and oversee course staffing.

Figure 4.11: User Management Interface

Figure 4.12: Academic Course Portal

## IV.III University and Oversight

Admins manage a registry of partner institutions and can deregister students or deassign instructors from specific courses.

Figure 4.13: University Registry

Figure 4.14: Course Oversight View

## V Data Analyst Portal Implementation

The Data Analyst portal provides data-driven insights for platform-wide learning growth.

## V.I Platform Analytics Dashboard

Upon entry, the analyst is presented with high-level financial and engagement metrics:

- **Key Performance Indicators:** Real-time tracking of Total Revenue, Total Enrollments, and Average Revenue per Course.
- **Top Performers:** Identification of the Top Revenue Course and the Top Enrollment Country (e.g., Pakistan, India) based on student density.

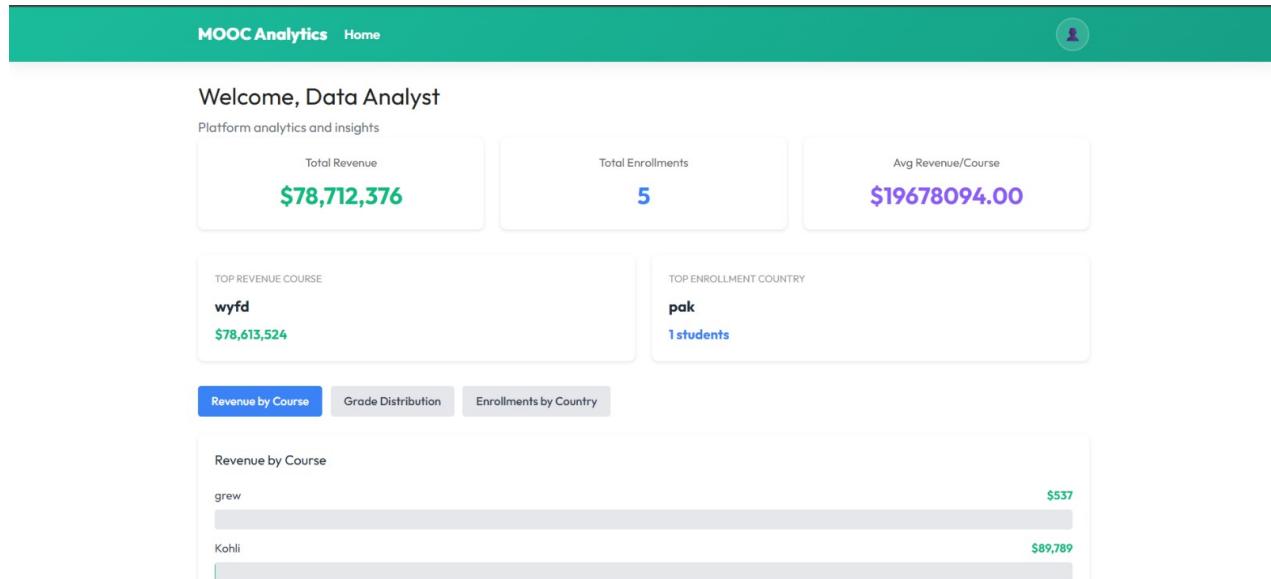


Figure 4.15: Platform Analytics and Performance Dashboard

## V.II Visual Data Breakdown

The analyst can toggle between different visual reports to analyze platform health:

- **Revenue by Course:** A bar chart breakdown showing earnings generated by individual courses (e.g., grew, Kohli).
- **Enrollments by Country:** A geographical distribution report showing student counts per region (e.g., India, Pakistan).
- **Grade Distribution:** Analysis of student performance metrics to evaluate course effectiveness and quality assurance.

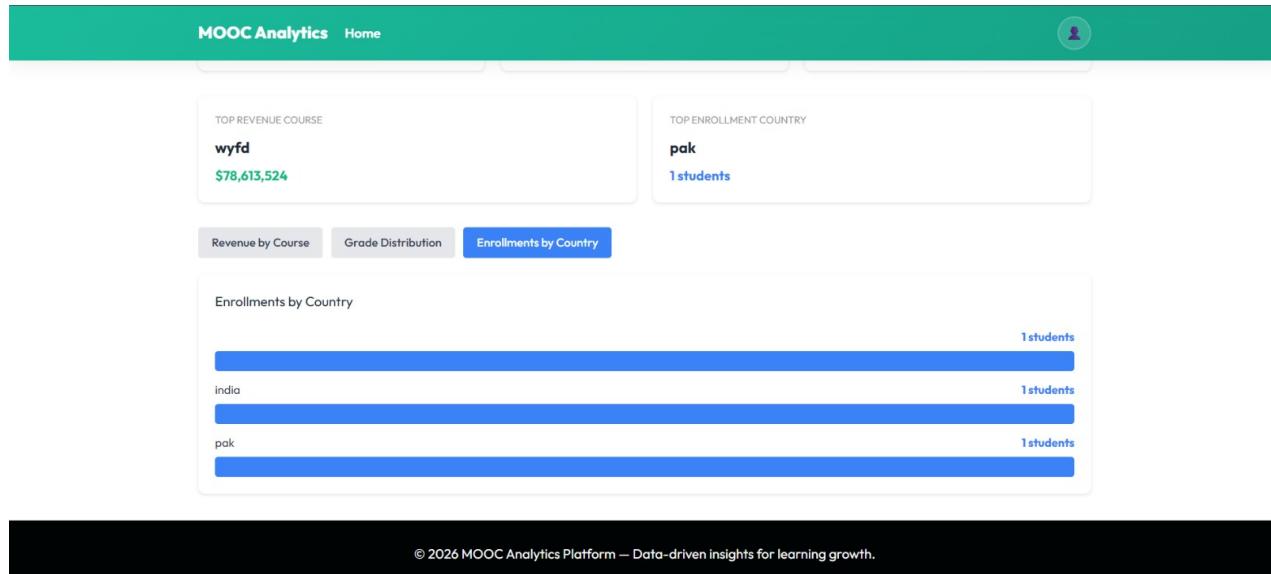


Figure 4.16: Student Demographic and Enrollment Analysis