

Database Management Systems Project

Team: Quintet

Relational Schema & Technical Specification

Team Details

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Technology Stack

For the implementation of this database system, the following technologies are utilized:

- **Backend Framework:** Python with **FastAPI** (Asynchronous high-performance framework).
- **Frontend Framework:** **Next.js** (React-based framework for server-side rendering).
- **Database Engine:** Relational SQL Database (PostgreSQL).

Database Relational Schema

This schema is derived from the updated ERD. Primary keys are underlined and foreign keys are denoted with **(FK)**.

1. Core Entity Tables

- **USER** (user_id, email_id, role, password)
- **STUDENT** (student_id, user_id **(FK)**, age, skill_level, category, country)
- **INSTRUCTOR** (instructor_id, user_id **(FK)**, name, expertise)
- **UNIVERSITY** (university_id, name, country)
- **TOPIC** (topic_id, topic_name)
- **TEXTBOOK** (textbook_id, title, author)

2. Relationship-Derived Tables

- **COURSE** (course_id, course_name, duration, program_type, instructor_id **(FK)**, university_id **(FK)**)
- **CONTENT** (content_id, course_id **(FK)**, type, content_url)
- **ENROLLMENT** (student_id **(FK)**, course_id **(FK)**, evaluation_score)
- **COURSE_TOPIC** (course_id **(FK)**, topic_id **(FK)**)
- **TEXTBOOK_USED** (course_id **(FK)**, textbook_id **(FK)**)

3. Schema Summary Table

Table	Attributes (PK underlined)
USER	<u>user_id</u> , email_id, role, password
STUDENT	<u>student_id</u> , user_id (FK), age, skill_level, category, country
INSTRUCTOR	<u>instructor_id</u> , user_id (FK), name, expertise
COURSE	<u>course_id</u> , course_name, duration, program_type, instructor_id (FK), university_id (FK)
ENROLLMENT	<u>student_id</u> (FK), <u>course_id</u> (FK), evaluation_score
CONTENT	<u>content_id</u> , course_id (FK), type, content_url

Table 1: Consolidated Relational Mapping Summary

