Mini Project: Online Course Management System

Objective:

To design a relational database for managing students, instructors, courses, enrollments, and course materials, using foreign keys and constraints to enforce relationships.

Tables and Relationships:

1. Students

- StudentID (Primary Key)

- Name

- Email (Unique)

2. Instructors

- InstructorID (Primary Key)

- Name

- Department

3. Courses

- CourseID (Primary Key)

- Title

- InstructorID (Foreign Key -> Instructors.InstructorID)

4. Enrollments (Many-to-Many junction table)

- EnrollmentID (Primary Key)

- StudentID (Foreign Key -> Students.StudentID)

- CourseID (Foreign Key -> Courses.CourseID)

- EnrollDate

5. CourseMaterials

- MaterialID (Primary Key)

- CourseID (Foreign Key -> Courses.CourseID)

- Title

- FileURL

SQL Code:

```sql
-- Students
CREATE TABLE Students (
    StudentID INT PRIMARY KEY,
    Name VARCHAR(100),
    Email VARCHAR(100) UNIQUE
);

-- Instructors
CREATE TABLE Instructors (
    InstructorID INT PRIMARY KEY,
    Name VARCHAR(100),
    Department VARCHAR(100)
);

-- Courses
CREATE TABLE Courses (
    CourseID INT PRIMARY KEY,
    Title VARCHAR(100),
```

```sql
    InstructorID INT,

    FOREIGN KEY (InstructorID) REFERENCES Instructors(InstructorID)
);


-- Enrollments
CREATE TABLE Enrollments (

    EnrollmentID INT PRIMARY KEY,

    StudentID INT,

    CourseID INT,

    EnrollDate DATE,

    FOREIGN KEY (StudentID) REFERENCES Students(StudentID),

    FOREIGN KEY (CourseID) REFERENCES Courses(CourseID)
);


-- CourseMaterials
CREATE TABLE CourseMaterials (

    MaterialID INT PRIMARY KEY,

    CourseID INT,

    Title VARCHAR(100),

    FileURL VARCHAR(200),

    FOREIGN KEY (CourseID) REFERENCES Courses(CourseID)
);
```

Test Data:

```sql
INSERT INTO Students VALUES (1, 'Aesu', 'aesvi@example.com');

INSERT INTO Students VALUES (2, 'Riya', 'riya@example.com');
```

```sql
INSERT INTO Instructors VALUES (101, 'Dr. Mehta', 'Computer Science');

INSERT INTO Instructors VALUES (102, 'Prof. Shah', 'Mathematics');


INSERT INTO Courses VALUES (201, 'Database Systems', 101);

INSERT INTO Courses VALUES (202, 'Discrete Mathematics', 102);


INSERT INTO Enrollments VALUES (1, 1, 201, '2025-05-01');

INSERT INTO Enrollments VALUES (2, 2, 201, '2025-05-02');

INSERT INTO Enrollments VALUES (3, 1, 202, '2025-05-03');


INSERT INTO CourseMaterials VALUES (1, 201, 'ER Diagrams PDF', 'https://example.com/er.pdf');

INSERT INTO CourseMaterials VALUES (2, 202, 'Logic Notes', 'https://example.com/logic.pdf');
```