

# Academa - Online Learning Management System

## Project Specification

### 1. Data Model Description

This project uses a **relational data model** to represent the entities and their relationships within an online learning platform.

#### Entities:

- **Course:**
  - Fields: `id`, `name`, `description`, `schedule`
  - Relationships:
    - A course is taught by one instructor (Many-to-One relationship).
    - Students enroll in courses, creating a Many-to-Many relationship between `Course` and `Student`.
- **Instructor:**
  - Fields: `id`, `name`, `expertise`
  - Relationships:
    - An instructor can teach multiple courses, creating a One-to-Many relationship with `Course`.
- **Student:**
  - Fields: `id`, `name`, `email`
  - Relationships:
    - A student can enroll in multiple courses, creating a Many-to-Many relationship with `Course`.
- **Enrollment:**
  - Represents the enrollment of students in courses.
  - Fields: `student_id`, `course_id`, `enrollment_date`

### 2. Complex Query Description

The complex query will retrieve all students enrolled in a specific course, along with the instructors teaching that course. This query will use the relationship between `Student`, `Course`, and `Instructor` to gather the relevant data.

### **3. Business Logic Operation**

The business logic ensures that students can enroll in multiple courses, but with the following validation checks:

- The student cannot enroll in courses that overlap in their scheduled times.
- The enrollment will only proceed if the course still has available seats.

This validation ensures that students' schedules are conflict-free and that the course has the capacity to accommodate them.