



Entities and Fields

1. ROLES

- role_id (int, PK)
- role_name (string)
- description (string, optional)

2. USERS

- user_id (int, PK)
- first_name (string)
- last_name (string)

- email (string)
- password (string)
- role_id (int, FK → ROLES.role_id)
- date_joined (datetime)
- is_active (boolean)

3. COURSES

- course_id (int, PK)
- title (string)
- description (string)
- instructor_id (int, FK → USERS.user_id)
- is_published (boolean)
- created_at (datetime)
- updated_at (datetime)

4. MODULES

- module_id (int, PK)
- course_id (int, FK → COURSES.course_id)
- title (string)
- description (string)
- created_by (int, FK → USERS.user_id)
- created_at (datetime)
- updated_at (datetime)

5. LECTURES

- lecture_id (int, PK)
- module_id (int, FK → MODULES.module_id)
- title (string)
- content_type (string, e.g., 'pdf', 'video')
- content_url (string)
- created_at (datetime)
- updated_at (datetime)

6. ASSESSMENTS

- assessment_id (int, PK)
- title (string)
- description (string)
- pdf_source_url (string)
- lecture_id (int, FK → LECTURES.lecture_id, nullable)
- module_id (int, FK → MODULES.module_id, nullable)
- course_id (int, FK → COURSES.course_id, nullable)
- is_published (boolean)
- created_by (int, FK → USERS.user_id)
- created_at (datetime)
- updated_at (datetime)

7. ASSESSMENTQUESTIONS

- question_id (int, PK)
- assessment_id (int, FK → ASSESSMENTS.assessment_id)
- question_text (string)
- options (string / JSON)
- correct_answer (string)
- points (int)

8. ASSESSMENTRESPONSES

- response_id (int, PK)
- assessment_id (int, FK → ASSESSMENTS.assessment_id)
- user_id (int, FK → USERS.user_id)
- question_id (int, FK → ASSESSMENTQUESTIONS.question_id)
- answer (string)
- score (decimal)
- feedback (string)
- submitted_at (datetime)

9. GRADES

- grade_id (int, PK)
- user_id (int, FK → USERS.user_id)
- course_id (int, FK → COURSES.course_id)
- module_id (int, FK → MODULES.module_id)

- assessment_id (int, FK → ASSESSMENTS.assessment_id)
- grade_type (string)
- score (decimal)
- weight (decimal)
- calculated_at (datetime)
- remarks (string)
- overridden_by (int, FK → USERS.user_id, optional)

10. AIINSIGHTS

- insight_id (int, PK)
- user_id (int, FK → USERS.user_id, UNIQUE)
- generated_at (datetime)
- weakness_summary (string)
- improvement_areas_json (string)
- recommended_courses_json (string)
- confidence_score (decimal)
- reviewed_by (int, FK → USERS.user_id, optional)

Relationships / Connections

1. USERS → ROLES: Many-to-One (USERS.role_id → ROLES.role_id)
2. USERS → COURSES: One-to-Many (COURSES.instructor_id → USERS.user_id)

3. USERS → ASSESSMENTS: One-to-Many (ASSESSMENTS.created_by → USERS.user_id)
4. USERS → ASSESSMENTRESPONSES: One-to-Many (ASSESSMENTRESPONSES.user_id → USERS.user_id)
5. USERS → GRADES: One-to-Many (GRADES.user_id → USERS.user_id)
6. USERS → AIINSIGHTS: One-to-One (AIINSIGHTS.user_id → USERS.user_id)
7. COURSES → MODULES: One-to-Many (MODULES.course_id → COURSES.course_id)
8. MODULES → LECTURES: One-to-Many (LECTURES.module_id → MODULES.module_id)
9. LECTURES → ASSESSMENTS: One-to-Many (ASSESSMENTS.lecture_id → LECTURES.lecture_id)
10. MODULES → ASSESSMENTS: One-to-Many (ASSESSMENTS.module_id → MODULES.module_id)
11. COURSES → ASSESSMENTS: One-to-Many (ASSESSMENTS.course_id → COURSES.course_id)
12. ASSESSMENTS → ASSESSMENTQUESTIONS: One-to-Many (ASSESSMENTQUESTIONS.assessment_id → ASSESSMENTS.assessment_id)
13. ASSESSMENTS → ASSESSMENTRESPONSES: One-to-Many (ASSESSMENTRESPONSES.assessment_id → ASSESSMENTS.assessment_id)
14. ASSESSMENTQUESTIONS → ASSESSMENTRESPONSES: One-to-Many (ASSESSMENTRESPONSES.question_id → ASSESSMENTQUESTIONS.question_id)
15. GRADES → AIINSIGHTS: Derived (AI reads grades per user; no direct FK needed)