

SCENARIO: we want to represent the following information:

Students (with Student id, student name, address) sit exams for Courses (with course id, course name) which are taught by Lecturers (with lecturer id, lecturer name).

3 main concepts: students, courses, lecturers

- Student: ID, name, address
- Course: ID, name
- Lecturer: ID, name

Additional information on:

- Grade corresponding to an exam
- Which lecturer teaches a given course

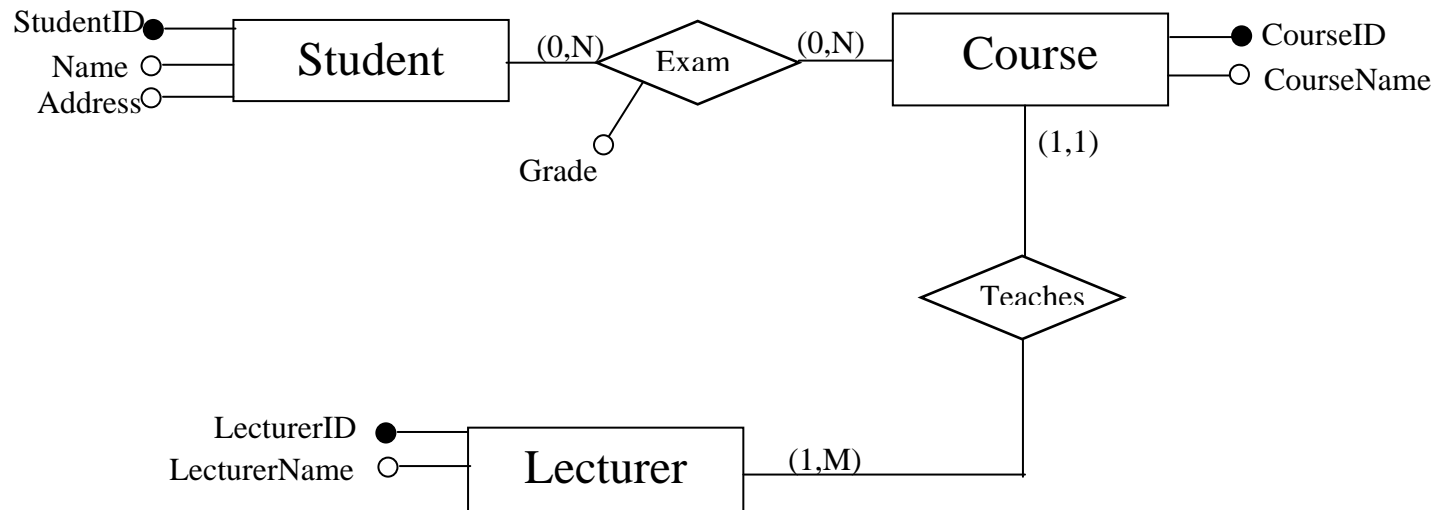
STEP 1:

Decide whether to represent each piece of information by means of entities/relationships.

In general:

- main (independent) concepts represented by entities
- information relating different concepts represented by relationship

STEP 2: build the corresponding E-R diagram with cardinalities and identifiers



ASSUMPTIONS and CONSTRAINTS:

1. A student can pass many exams for different courses: cardinality (0,N)
2. The exam for a given course can be passed by different students: cardinality (0,N)
3. Each student can only pass a given exam once (i.e., studentID + courseID uniquely identify an exam)
4. Each course (id) has only one lecturer: cardinality (1,1)
5. Each lecturer can teach several courses but at least one: cardinality (1,N)

STEP 3: translate into relational model.

STUDENT(StudentID, Name, Address)
COURSE(CourseID, CourseName, LecturerID)
LECTURER(LecturerID, LecturerName)
EXAM(StudentID, CourseID, Grade)

Note: key of EXAM determined by assumption 3.

Alternatively: we could define a relation corresponding to relationship TEACHES with attributes CourseID, LecturerID.

However, this information can be incorporated into relation COURSE because CourseID uniquely identifies LecturerID (one course is taught by only one lecturer) as shown previously.