

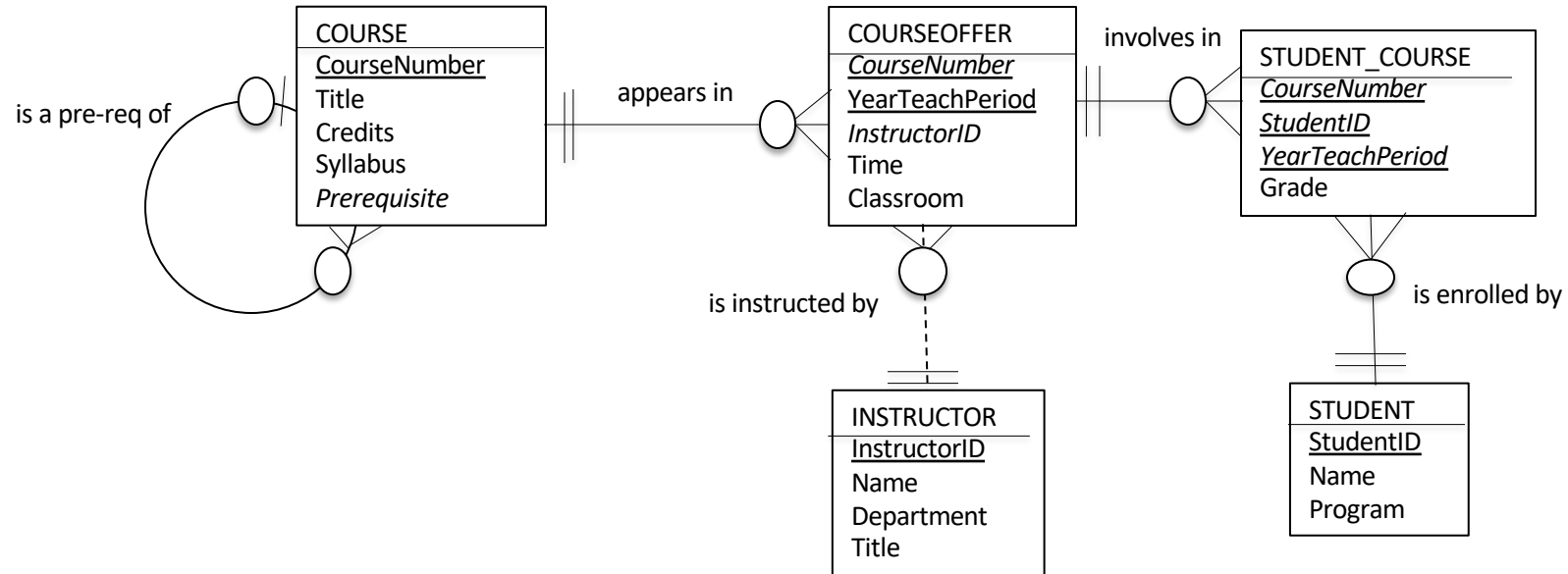
Design an ERD and Convert it into Relation Schema

Design ERD Example

- Design an ER diagram for university registrar including the following entities:
 - **Courses**, including course number, title, credits, syllabus, and prerequisites;
 - **Course offerings**, including course number, year and teaching period, instructors, timings and classroom
 - **Students**, including student-id, name, and program; and
 - **Instructors**, including identification number, name, department, and title.
- Further, the **enrolment** of students in courses and grades awarded to students in each course they are enrolled for must be appropriately modelled.
- **Document all assumptions that you have made**

- Assumptions are details that are not necessarily explicit within the description provided. These assumptions need to be checked and **should be realistic and not contradict anything that is in the description**. For example, in this case you could not assume that a student would ever only take one course.
- **For this ERD:**
 - A course may be a pre-requisite of many other courses, but a course may have only one pre-requisite.
 - A course offer may attract many students and a student may enrol in many course offerings. So, a bridging entity Student_Course is inserted to replace the M:N relationship with two 1:M relationships.
 - An instructor may teach many courses and a course may be taught by different instructors in different course offerings. So, the relationship between Course and Instructor is M:N. To solve it, a bridging entity Course offer is given.

Resulting ER Diagram



- Can you explain connectivity, participation, strong and weak relationships

Converting ER into a Relation

COURSE
<u>CourseNumber</u>
Title
Credits
Syllabus
<i>Prerequisite</i>

COURSE (CourseNumber, Title, Credits, Syllabus, *Prerequisite*)

Converting ER into a Relation

COURSEOFFER
<u>CourseNumber</u>
<u>YearTeachPeriod</u>
InstructorID
Time
Classroom

COURSEOFFER(CourseNumber, YearTeachPeriod, InstructorID, Time, Classroom)

Converting ER into a Relation

STUDENT_COURSE
<u>CourseNumber</u>
<u>StudentID</u>
<u>YearTeachPeriod</u>
Grade

STUDENT_COURSE(CourseNumber, StudentID, YearTeachPeriod, Grade)

Converting ER into a Relation

STUDENT
<u>StudentID</u>
Name
Program

STUDENT (StudentID, Name, Program)

Converting ER into a Relation

INSTRUCTOR
<u>InstructorID</u>
Name
Department
Title

INSTRUCTOR(InstructorID, Name, Department, Title)

Converting ER into a Relation

- COURSE(CourseNumber, Title, Credits, Syllabus, *Prerequisite*)
- COURSEOFFERED(CourseNumber, YearTeachPeriod, *InstructorID*, Time, Classroom)
- STUDENT_COURSE(CourseNumber, StudentID, YearTeachPeriod, Grade)
- INSTRUCTOR(InstructorID, Name, Department, Title)
- STUDENT (StudentID, Name, Photo)

Thank you