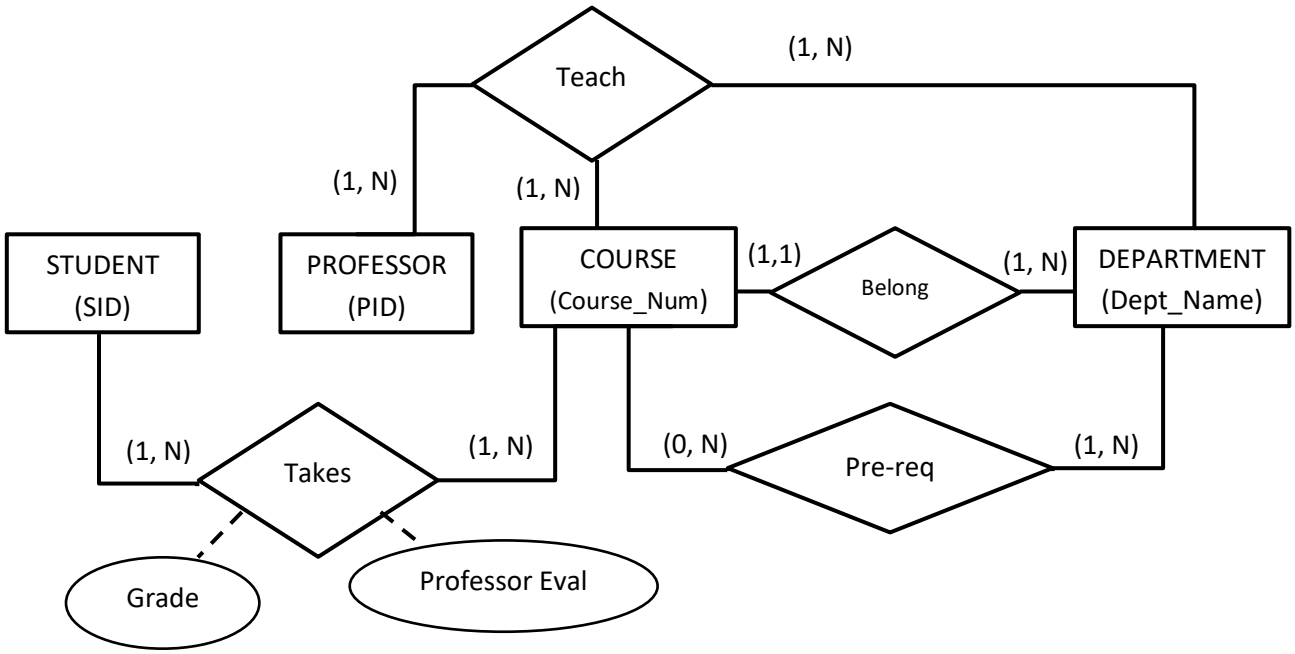
CSC-430 / 530 – Database Management Systems / Database Theory
Lab 1: Hand on Exercise (Jan 14th, 2022)

Provided are the **Requirements of a Client to create a database for FireFox University.**

- The client wants a system that should keep track of all students (their names, IDs, and addresses) and professors (Names, IDs, departments). The client is not interested to keep record of the address of professors but wants to keep track of their ages.
- Furthermore, the system should help maintain details of all courses offered and details about the courses. For instance, we should be able to retrieve the attrition of a course taught by a faculty during a quarter. or What is the current enrollment? and Which department offers a specific course?
- In addition, the client is building this system as it wants to meet the university board specified constraints. The system should therefore enable the client to know when
    - A course can have ≥ 0 pre-requisites
    - Each course must be taught by a professor
    - Every student evaluates the professor teaching the course
    - Each student receives a single grade (A, B, C, D, or F) for each course registered at the end of the quarter
    - The departments are unique, and should have at least one department chair
    - A department chair is not allowed to head more than one department

Part 1: Task - Given the following Conceptual Model: (a) Verify the corresponding Relational Model; Ensure that you understand the relational model – especially the Entity and the Referential Integrity Constraints



Turn In this Sheet:

NAME:

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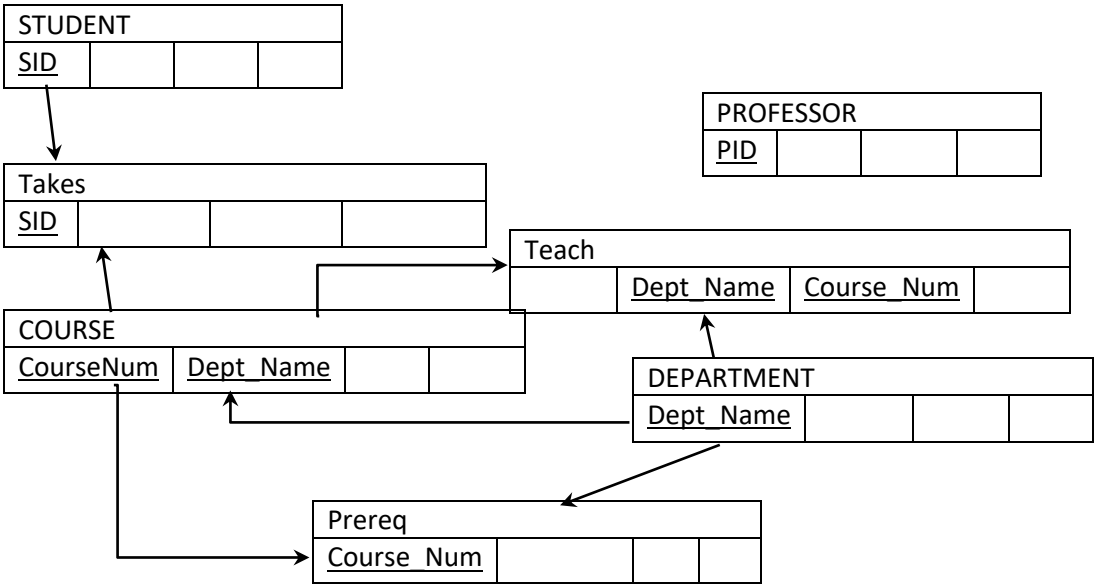

(b) Write down the resultant schemas of the tables in the database. Note, list the relational schemas of **entities first**, followed by the schemas of the relationships.

Part 2: Table Descriptions (your meta data)

The tables are described in order of relationship described in the previous figure.

STUDENT

There is one row in the STUDENT table for each student registering for the course.

Column Name	Data Type	Meaning	NULL allowed
SID	Varchar (10)	Student ID	No
Name	Varchar (45)	Last, First Name	Yes
Address	Varchar (45)	Address	Yes

PROFESSOR

There is one row in the PROFESSOR table for each professor in the department

Column Name	Data Type	Meaning	NULL allowed
PID	Varchar (10)	Professor ID	No
Name	Varchar (45)	Last, First Name	Yes
Office	Varchar (10)	Office number	Yes
DateofBirth	Date	Age of Professor	Yes

COURSE

There is one row in the COURSE table for each course offered that quarter.

Column Name	Data Type	Meaning	NULL allowed
CourseNum	Integer	Course number	No
DeptName	Varchar(45)	Name of Department	No
CourseName	Varchar(45)	Course Name	No
ClassRoom	DateTime	Room Number	Yes
Enrollment	Integer	Number of Students Enrolled	Yes

DEPARTMENT

There is one row in the DEPARTMENTS table for each department in the University.

Column Name	Data Type	Meaning	NULL allowed
DeptName	Varchar (45)	Name of Department	No
ChairmanID	Varchar (45)	Name of Chairman	Yes

Prereq

There is one row in the Prereq table for each pre-requite for any course.

Column Name	Data Type	Meaning	NULL allowed
CourseNum	Integer	Course Number	No
DeptName	Varchar (45)	Name of Department	No
PreReqNumber	Integer	Pre requisite Number	Yes
PreReqDeptName	Varchar (45)	Pre requisite Dept Name	Yes

Teach

There is a row in the TEACH table for each course taught by a professor.

Column Name	Data Type	Meaning	NULL allowed
PID	Varchar(10)	Professor who teaches the course	No
CourseNum	Integer	The course taught	No
DeptName	Varchar (45)	The department the course taught	No

Takes

There is a row in the TAKE table for each course enrolled by a student.

Column Name	Data Type	Meaning	NULL allowed
SID	Varchar (10)	ID of student taking a course	No
CourseNum	Integer	The course take by student	No
DeptName	Varchar (45)	The department of course	No
Grade	Decimal(4,2)	The grade obtained	Yes
ProfessorEval	Decimal(4,2)	The professor evaluation	Yes

Exercise: (c) Use the DLL commands of SQL to create the resulting schemas