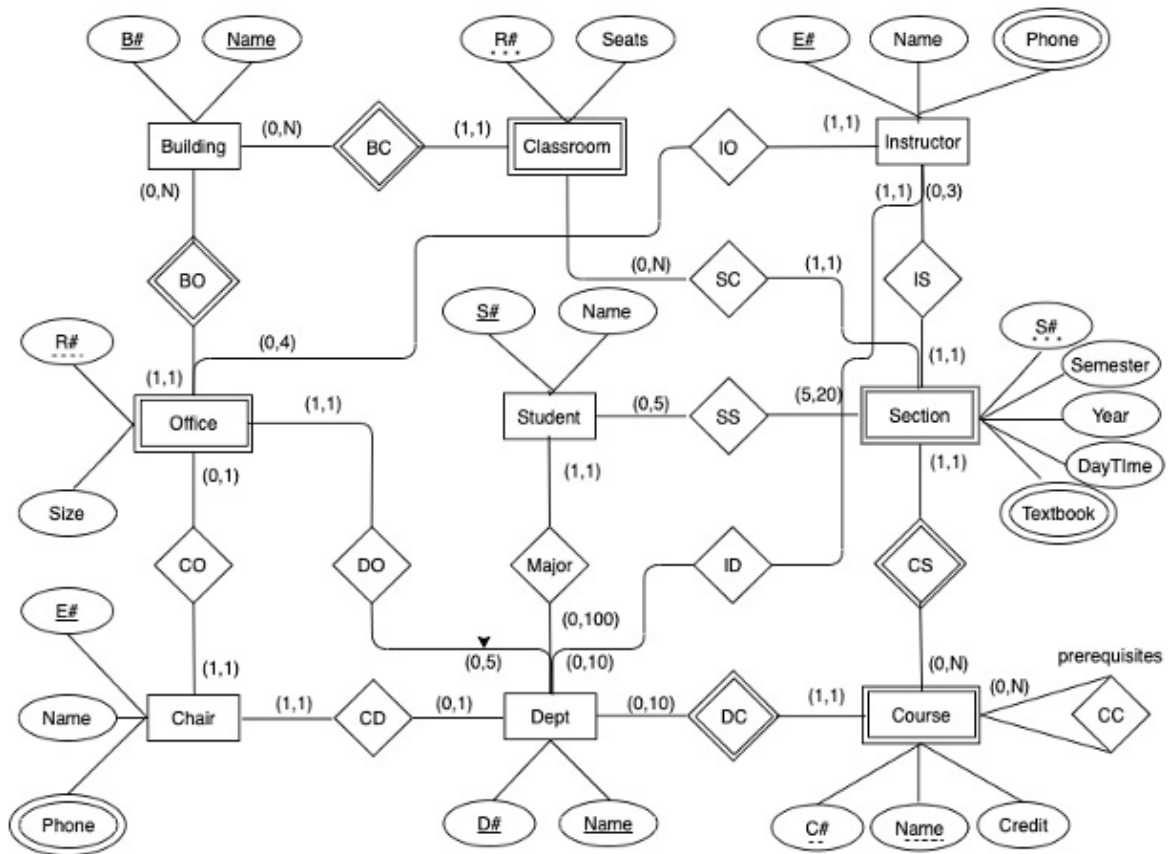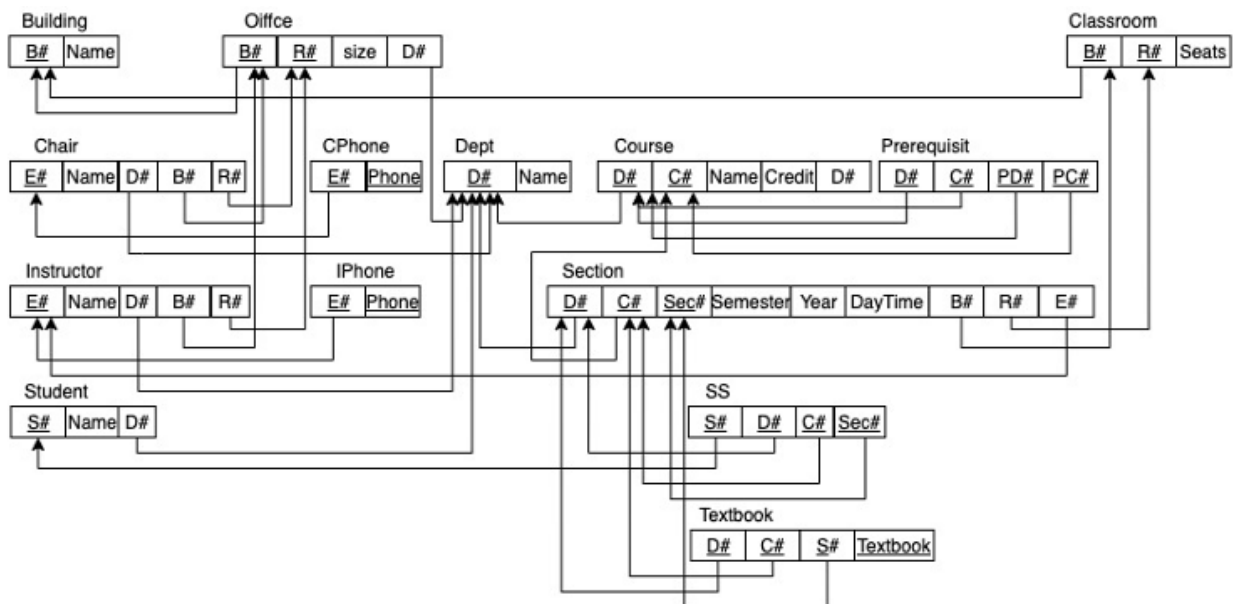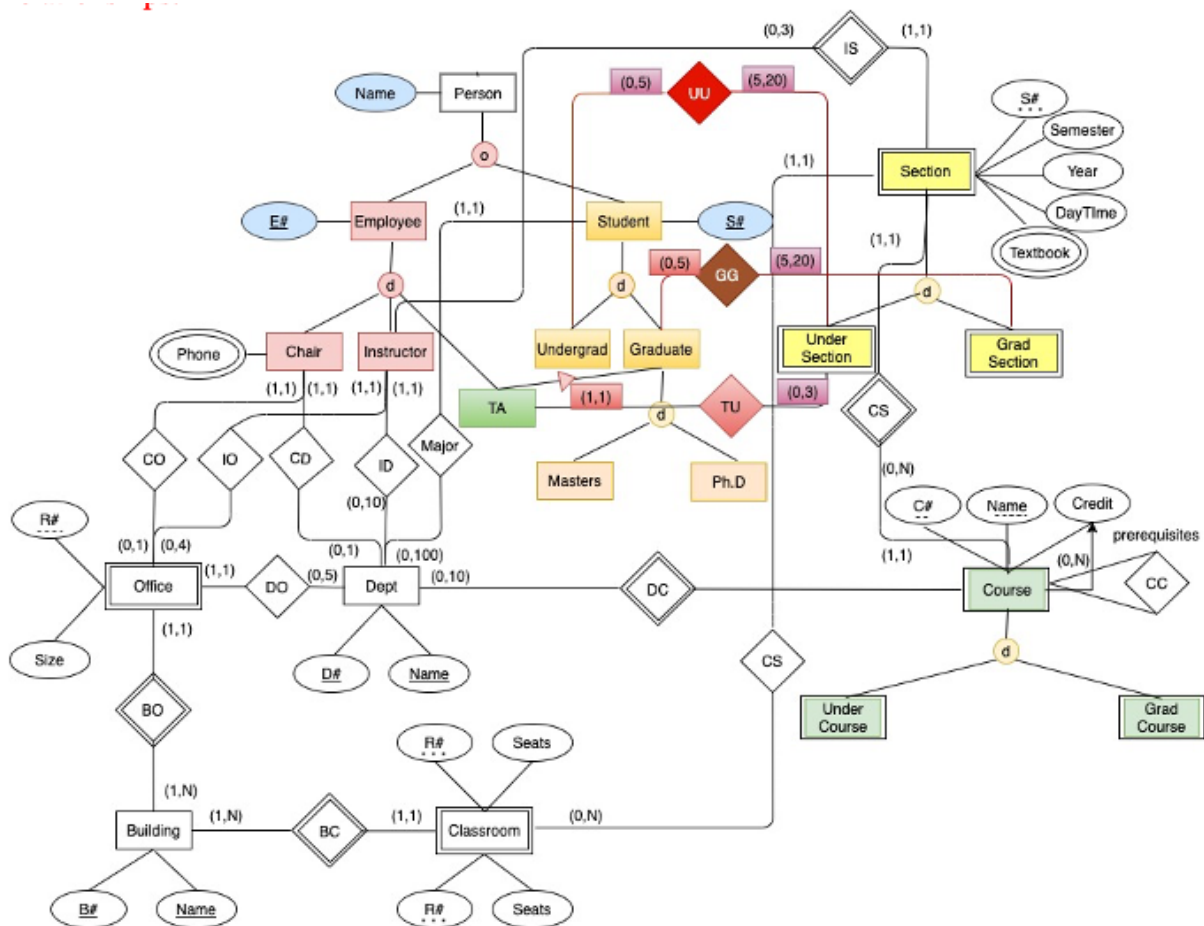# ER/EER Model Assignment

1. A university information system involves buildings, classrooms, offices, department, courses, sections, chairs, instructors, and students. Draw the ER diagram for this information system that can represent the constraints specified above.
   a. A building has a unique building number such as HP, a unique name, and a number of classrooms and offices.
   b. A classroom has a room number such as 5125 that is unique in the building, the number of seats, and is either empty or used by a number of sections at different days and times.
   c. An office has a room number that is unique in the building, the size in square feet, and is either empty, or occupied by a chair or up to 4 instructors.
   d. A department has a unique dept code such as COMP, a unique name, 0 or 1 chair, 0 to 10 instructors, 0 to 100 students, 0 to 10 courses, 0 to 5 offices in the same or different buildings and no offices are shared by different departments.
   e. A course has a unique course number such as 3005 and name such as Databases that are unique in the department that offers the course, credit hours and a number of prerequisite courses. Courses are offered as sections and not all courses are offered.
   f. A section has a unique section code such as A and B within the course, semester, year, classroom, day and time such as MW 11:55-12:55, TR 10:05-11:55, textbooks, and is related to one course, one instructor, and 5 to 20 students. Just consider current sections only.
   g. A chair or an instructor has a unique employee number, a name, an office, 0 to 3 phone numbers, and can only work in one department. Note that a chair is not an instructor, vice versa. An instructor teaches 0-3 sections.
   h. A student has a unique student number, a name, majors in one department and takes 0 to 5 sections. (and have a grade for each section).

ER Diagram entities and relationships:

- Building (B#, Name)
- Classroom (R#, Seats)
- Instructor (E#, Name, Phone)
- Office (R#, Size)
- Student (S#, Name)
- Section (S#, Semester, Year, DayTime, Textbook)
- Chair (E#, Name, Phone)
- Dept (D#, Name)
- Course (C#, Name, Credit)

Relationships: BC (0,N)(1,1), BO (0,N)(1,1), IO (1,1), SC (0,N)(1,1), IS (1,1)(0,3)(1,1), SS (0,5)(5,20), CO (1,1)(0,1), DO (1,1), Major (1,1)(0,100), ID (0,5)(0,10), CS (1,1)(0,N), CD (1,1)(0,1), DC (0,10)(1,1), CC prerequisites (0,N)(0,N)

2. Map the ER diagram generated from Question 1 into a relational schema

Building

B#	Name

Oiffce

B#	R#	size	D#

Classroom

B#	R#	Seats

Chair

E#	Name	D#	B#	R#

CPhone

E#	Phone

Dept

D#	Name

Course

D#	C#	Name	Credit	D#

Prerequisit

D#	C#	PD#	PC#

Instructor

E#	Name	D#	B#	R#

IPhone

E#	Phone

Section

D#	C#	Sec#	Semester	Year	DayTime	B#	R#	E#

Student

S#	Name	D#

SS

S#	D#	C#	Sec#

Textbook

D#	C#	S#	Textbook

3. Extend the ER diagram generated from Question 1 with the following additional information. Draw the EER diagram with the additional constraints taken into account.
   a. A person is either a student or an employee.
   b. A student is either an undergraduate student or a graduate student. A graduate student is either a Masters student or PHD student.
   c. An employee is either a chair, an instructor or a TA who is also a student.
   d. A course is either an undergraduate course or a graduate course.
   e. An undergraduate course section can have up to 3 TAs who are graduate students and is taken only by undergraduate students.
   f. A graduate student takes graduate course sections

4. Map the EER diagram from Question 3 into a relational database schema.

Building

B#	Name

Oiffce

B#	R#	size	D#

Classroom

B#	R#	Seats

Chair

E#	Name	D#	B#	R#

CPhone

E#	Phone

Dept

D#	Name

Course

D#	C#	Name	Credit	D#	CType

Prerequisit

D#	C#	PD#	PC#

Instructor

E#	Name	D#	B#	R#

IPhone

E#	Phone

Section

D#	C#	Sec#	Semester	Year	DayTime	B#	R#	E#	SType

Student

S#	Name	D#	SType	TAFlag

SS

S#	D#	C#	Sec#

TA

E#	S#	Name	D#	C#	Sec#

Textbook

D#	C#	S#	Textbook