

CS 309: Database Management System
EC Database Project
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Database Project Specification

Relationships

ENTITY	RELATIONSHIP	CONNECTIVITY	ENTITY	RELATIONSHIP STRENGTH
SCHOOL	operates	1:M	DEPARTMENT	WEAK
DEPARTMENT	has	1:M	STUDENT	WEAK
DEPARTMENT	employs	1:M	PROFESSOR	WEAK
DEPARTMENT	offers	1:M	COURSE	WEAK
COURSE	generates	1:M	CLASS	WEAK
SEMESTER	includes	1:M	CLASS	WEAK
PROFESSOR	in dean of	1:1	SCHOOL	WEAK
PROFESSOR	chairs	1:1	DEPARTMENT	WEAK
PROFESSOR	teaches	1:M	CLASS	WEAK
PROFESSOR	advises	1:M	STUDENT	WEAK
STUDENT	enrolls in	M:N	CLASS	STRONG
BUILDING	contains	1:M	ROOM	WEAK
ROOM	is used for	1:M	CLASS	WEAK

Relationship Participation

The requirements for each Professor are as follows:

- A Professor is optional to advice students, and can advise as many students as the Professor is available to.
- A Professor is optional to be a dean of a school and can only be the dean of one school.
- A Professor is optional to chair a department, and can only chair one department.
- A Professor is mandatory employed by a department, and can only be employed by one department.
- A professor is optional to teach a class, and can teach as many classes as the Professor wants.

The requirements for each Student are as follows:

- A Student is mandatory to be advised by a Professor, and can only be advised by one Professor.
- A Student is optional to be a part of a Department, and can only be part of one Department.
- A Student is mandatory to be enrolled in Class, and can be enrolled in many Classes.

The requirements for each School are as follows:

- A School is mandatory to has a Professor as a dean, and can only has one Professor as a dean.
- A School is mandatory to be operated by a Department, and can be operated by many Departments

The requirements for each Department are as follows:

- A Department is mandatory to operate a School, and can only operate one School.
- A Department is mandatory to be chaired by a Professor, and can only be chaired by one Professor.
- A Department is mandatory to employ a Professor, and can employ as many Professors as it wants
- A Department is optional to offer courses, and can offer as many courses as it wants.
- A Department is optional to has a student, and can has as many students as it wants.

The requirements for each Semester are as follows:

- A Semester is optional to include a Class, and can include as many Classes as it wants.

The requirements for each Class are as follows:

- A Class is mandatory to be taught by a Professor, and can only be taught by one Professor.
- A Class is mandatory to be included in a Semester, and can only be included in one Semester
- A Class is mandatory to generate Courses, and can only generate one Course.
- A Class is mandatory to enroll Students, and can enroll many Students.
- A Class is mandatory to be given in a Room, and can only be given in one Room.

The requirements for each Room are as follows:

- A Room is optional to be used for a Class, and can be used for many Classes.
- A Room is mandatory contained in a Building, and can only be contained in one Building.

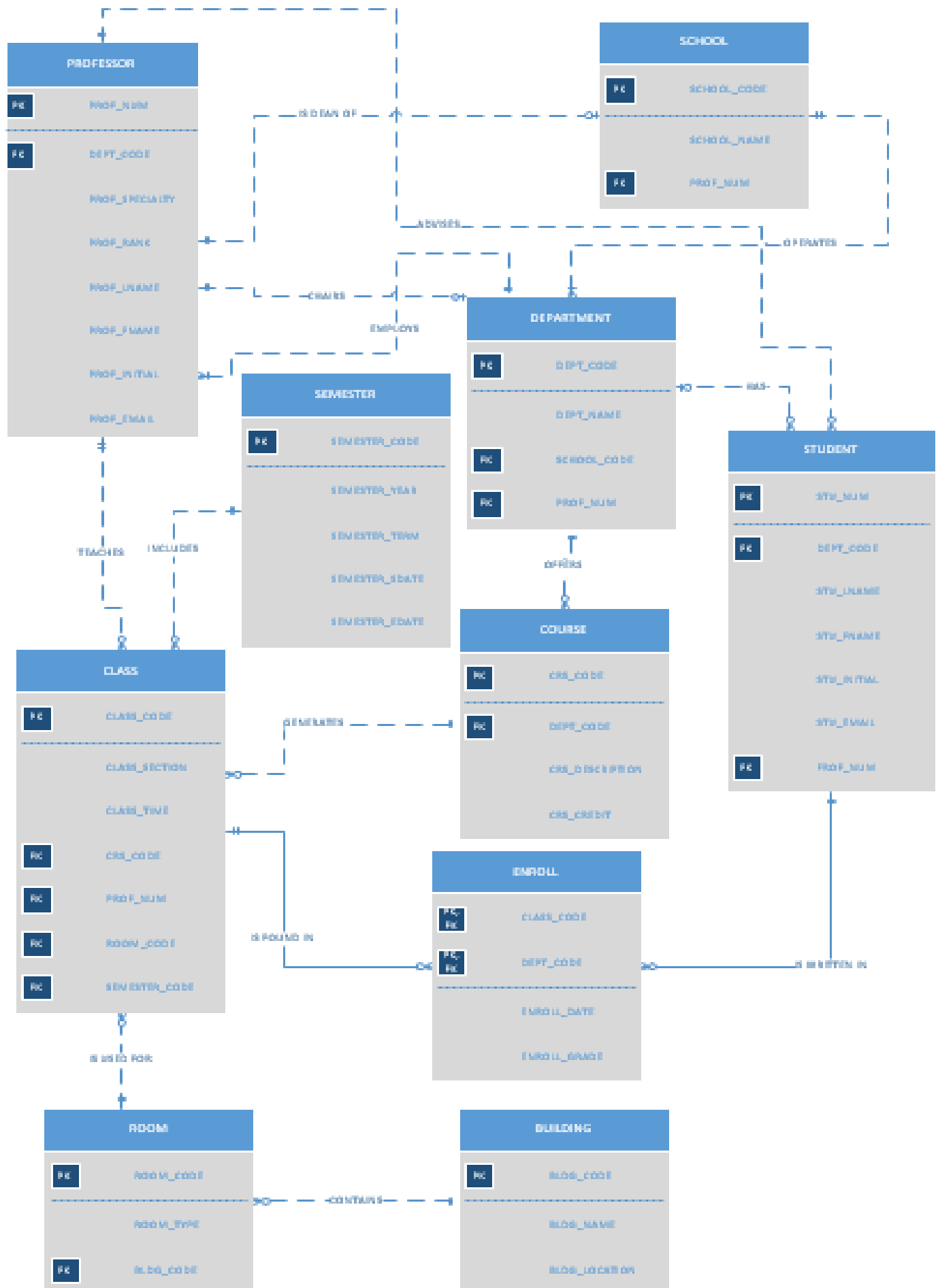
The requirements for each Building are as follows:

- A Building is optional to contain a Room, and can contain as many Rooms as it wants.

The requirements for each Course are as follows:

- A Course is optional to be generated by one Class, and can be generated by many Classes.
- A Course is mandatory to be offered by a Department, and can only be offered by one Department.

ERD



Tables in 3rd Normal Form

Professor: This table has one primary key which is PROF_NUM, and each attribute in the table determined by that one primary key. DEPT_CODE doesn't affect this because it is simply a foreign key, and PROF_NUM determines which DEPT_CODE will be for that Professor, which makes this table 2NF. There are no other attributes in the table that are determinants which makes this tables in 3NF as well.

School: This table has one primary key which is SCHOOL_CODE and each attribute in the table determines by that primary key. PROF_NUM is the foreign key in the table. SCHOOL_CODE determines which PROF_NUM will be for that School Entity, which makes this table 2NF. There are no other attributes in the table that are determinants which makes this table in 3NF as well.

Department: This table is in 2nd normal form (2NF). It has one primary key which is DEPT_CODE, and each attributes in the table determines by that primary key. There are two other foreign keys exist in this table- SCHOOL_CODE and PROF_NUM; which doesn't affect the entity. There are no other attributes in the table that are determinants which makes the table in 3NF as well.

Semester: This table has only one primary key, and each attribute in the table is determined by that one primary key which is automatically makes this table 2NF. There are no other attributes in the table are determinants which makes this table 3NF as well.

Course: This table has one primary key which is CRS_CODE and each attribute in the table determines by that primary key. DEPT_CODE is the foreign key in the table. CRS_CODE determines which DEPT_CODE will be for that Course entity, which makes this table 2NF. There are no other attributes in the table that are determinants which makes this table in 3NF as well.

Class: This table has one primary key and each attribute in the table is determined by that one primary key which is automatically makes this table in 2NF. This table has also four other foreign keys which determines the relationship between class and those foreign keys. There are no other attributes in the table are determinants which makes this table 3NF as well.

Building: This table has only one primary key which is BLDG_CODE, and each attribute in the table is determined by that one primary key which is automatically makes this table in 2NF. There are no other attributes in the table are determinants which makes this table 3NF as well.

Room: This table has one primary key which is ROOM_CODE and each attribute in the table determines by that primary key. BLDG_CODE is the foreign key in the table. ROOM_CODE determines which BLDG_CODE will be for that Room, which makes this table 2NF. There are no other attributes in the table that are determinants which makes this table in 3NF as well.