

**Project Group:**

- Project name: Registrar's Spreadsheet
- Team name: Team #8
- Members:

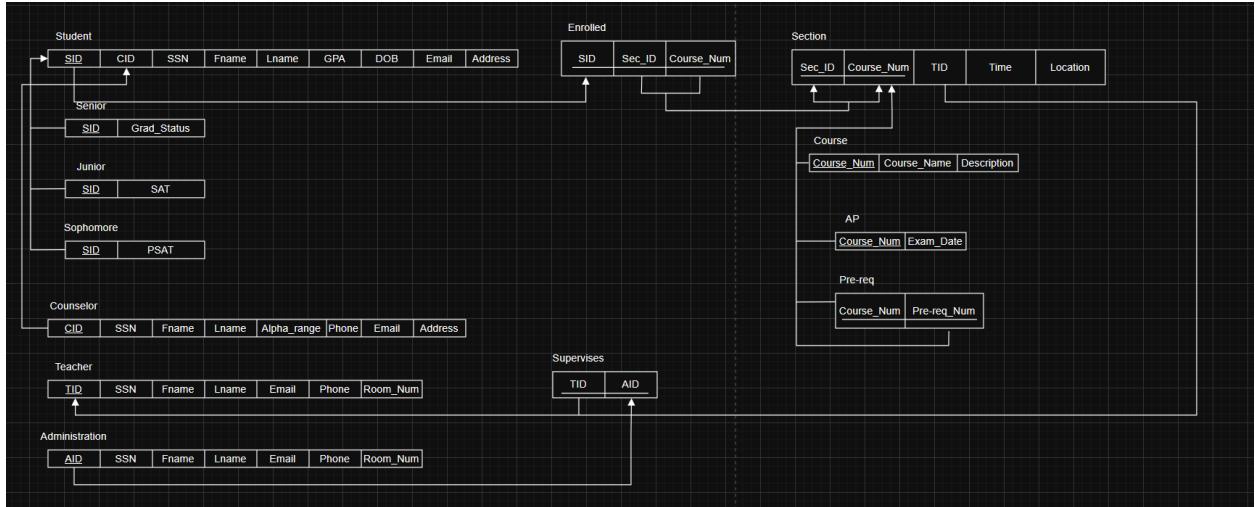
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**Phase 3, Task A****Description:**

The Relational Schema submitted for Phase 2 is already in third normal form. However, the student subclasses (Freshman, Sophomore, Junior, Senior) have many spurious, or redundant, copies of attributes such as GPA, Fname, Name, SSN, DOB, Email, and Address. This issue occurs for the Course subclasses as well. Therefore, we will remove those spurious attributes from the subclasses only. This will require that the Freshman relation be removed, because it has no unique non-redundant. In addition, we will correct that for relation Section, attributes Sec\_ID and Course\_num are together the primary key. The correction is done or relations Enrolled, Pre-req, and Supervises as well. These corrections will allow the relational schema to be in third normal form.

**Changes:**

- Remove redundant (spurious) attributes from Student subclasses
  - Remove the Freshman relation entirely for this reason
- PK(Enrolled) = {SID, SEC\_ID, Course\_Num}
- PK(Section) = {Sec\_ID, Course\_Num}
- Remove Course subclasses On-Level and Honors, because they only contribute redundant (spurious) attributes
- PK(Pre-req) = {Course\_Num, Pre-Req\_Num}
- PK(Supervises) = {Course\_Num, Pre-Req\_Num}



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### Functional Dependencies:

#### Student(SID, CID, SSN, Fname, Name, DPA, DOB, Email, Address)

- PK = {SID}
- FDs:  
SID → CID, SSN, Fname, Name, GPA, DOB, Email, Address
- 3NF: All other attributes depend only on the PK SID

#### Senior(SID, Grad\_Status)

- PK = {SID}
- FDs:  
SID → Grad\_Status
- 3NF: Only other attribute Grad\_Status depends only on PK SID

#### Junior(SID, SAT)

- PK = {SID}
- FDs:  
SID → SAT
- 3NF: Only other attribute SAT depends only on PK SID

#### Sophomore(SID, PSAT)

- PK = {SID}
- FDs:  
SID → PSAT
- 3NF: Only other attribute PSAT depends only on PK SID

#### Counselor(CID, SSN, Fname, Name, Alpha\_range, Phone, Email, Address)

- PK = {CID}
- FDs:  
CID → SSN, Fname, Name, Alpha\_range, Phone, Email, Address
- 3NF: All other attributes depend only on PK CID

#### Teacher(TID, SSN, Fname, Name, Email, Phone, Room\_Num)

- PK = {TID}
- FDs:

$TID \rightarrow SSN, Fname, Name, Email, Phone, Room\_Num$

- 3NF: All other attributes depend only on PK TID

#### **Administration(AID, SSN, Fname, Name, Email, Phone, Room\_Num)**

- PK = {AID}
- FDs:  
 $TID \rightarrow SSN, Fname, Name, Email, Phone, Room\_Num$
- 3NF: All other attributes depend only on PK AID

#### **Enrolled(SID, Sec\_ID, Course\_Num)**

- PK = {SID, Sec\_ID, Course\_Num}
- FDs:  
 $(SID, Sec\_ID, Course\_Num) \rightarrow \emptyset$
- 3NF: The relation is made up only of the primary key

#### **Supervises(TID, AID)**

- PK = {TID, AID}
- FDs:  
 $(TID, AID) \rightarrow \emptyset$
- 3NF: The relation is made up only of the primary key

#### **Section(Sec\_ID, Course\_Num, TID, Time, Location)**

- PK = {Sec\_ID, Course\_Num}
- FDs:  
 $(Sec\_ID, Course\_Num) \rightarrow Time, Location$
- 3NF: All other attributes depend only on the entire primary key (Sec\_ID, Course\_Num)
- **Course(Course\_Num, Course\_Name, Exam\_Date)**
- PK = {Course\_Num}
- FDs:  
 $Course\_Num \rightarrow Course\_Name, Exam\_Date$
- 3NF: All other attributes depend only on the primary key Course\_Num
- **AP(Course\_Num, Exam\_Date)**
- PK = {Course\_Num}
- FDs:  
 $Course\_Num \rightarrow Exam\_Date$
- 3NF: Only other attribute Exam\_Date depends only on the primary key Course\_Num

#### **Pre-req(Course\_Num, Pre-req\_Num)**

- PK = {Course\_Num, Pre-req\_Num}
- FDs:  
 $(Course\_Num, Pre-req\_Num) \rightarrow \emptyset$
- 3NF: The relation is made up only of the primary key