Course Selector Database Design

Requirements

We need to implement a database that stores course-related information for the University of Guelph and the users who use the application. Ultimately, the goal is to present the list of courses the user is eligible to take in the future, using the specific user information and the university course data.

STRONG ENTITY TYPES:

Each **student** is categorized by:

- Student ID
- Full Name
- Total completed credits
- Cumulative Average
- Program Major

Each **course** is categorized by:

- Course Code (eg. “CIS*2750”)
- Course Name
- Course Description
- Credits
- Location
- Restrictions

RELATIONSHIPS AND WEAK ENTITY TYPES:

Each course requires prerequisites to be met. Each **prerequisite** is categorized by:

- Course Code
- Description (eg. “CIS*2750”, “1 of …”)

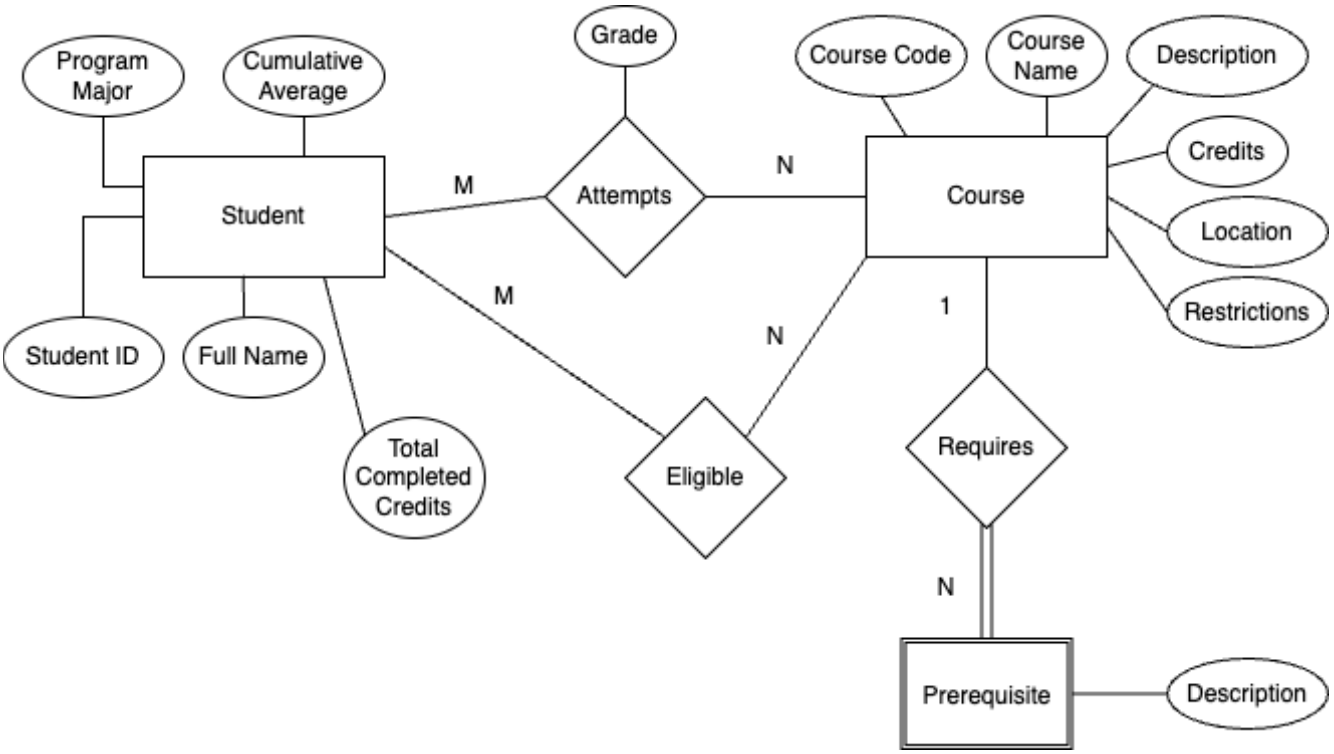
Each student attempts courses. Each **course attempt** is categorized by:

- Course Code
- Student ID
- Grade

The output of the program is the list of courses that the user is eligible to take in the future. Each **eligible** course is categorized by:

- Student ID
- Course Code

Entity Relationship (ER) Diagram



Relational Model

Student (<u>StudentID</u>, FName, CompletedCredits, CumulativeAverage, Major)

- **<u>StudentID</u>** → Primary Key, Integer, Unique
- **FName** → String
- **CompletedCredits** → Double
- **CumulativeAverage** → Double
- **Major** → String

Course (<u>CourseCode</u>, CourseName, Description, Credits, Location, Restrictions)

- **<u>CourseCode</u>** → Primary Key, String, Unique
- **CourseName** → String
- **Description** → String
- **Credits** → Double
- **Location** → String
- **Restrictions** → String

Prerequisite (<u>CourseCode</u>, <u>Description</u>)

- **<u>CourseCode</u>** → Foreign Key, String, Unique
- **<u>Description</u>** → Partial Key, String

CourseAttempt (<u>StudentID</u>, <u>CourseCode</u>, Grade)

- **<u>StudentID</u>** → Foreign Key, Integer, Unique
- **<u>CourseCode</u>** → Foreign Key, String, Unique
- **Grade** → Double

Eligible (<u>StudentID</u>, <u>CourseCode</u>)

- **<u>StudentID</u>** → Foreign Key, Integer, Unique
- **<u>CourseCode</u>** → Foreign Key, String, Unique

Relational Model (With Foreign Key Arrows)

Student (StudentID, FName, CompletedCredits, CumulativeAverage, Major)

- **StudentID** → Primary Key, Integer, Unique
- **FName** → String
- **CompletedCredits** → Double
- **CumulativeAverage** → Double
- **Major** → String

Course (CourseCode, CourseName, Description, Credits, Location, Restrictions)

- **CourseCode** → Primary Key, String, Unique
- **CourseName** → String
- **Description** → String
- **Credits** → Double
- **Location** → String
- **Restrictions** → String

Prerequisite (CourseCode, Description)

- **CourseCode** → Foreign Key, String, Unique
- **Description** → Partial Key, String

CourseAttempt (StudentID, CourseCode, Grade)

- **StudentID** → Foreign Key, Integer, Unique
- **CourseCode** → Foreign Key, String, Unique
- **Grade** → Double

Eligible (StudentID, CourseCode)

- **StudentID** → Foreign Key, Integer, Unique
- **CourseCode** → Foreign Key, String, Unique