Question 5

A university wants to create a database system to manage its students, courses, and instructors. The system must store the following information:

- Students have a Student_ID, Name, Email, Phone, and Date_of_Birth.
- Courses have a Course_ID, Course_Name, Credits, and Department.
- Instructors have an Instructor_ID, Name, Email, and Office_Room.
- Each student can enroll in multiple courses, and each course can have multiple students.
- Each course is taught by exactly one instructor, but an instructor can teach multiple courses.

Question:

- Identify the entities and their attributes from the scenario.
- Define the relationships between the entities (one-to-many, many-to-many, etc.).
- Draw an ERD (on paper or using a tool like Draw.io) representing this system.
- Specify the primary keys (PK) and foreign keys (FK) for each table.

Answer:

Students:

Attribute Name	Key	Type	Size	Required	Validation
Student_ID	pk	int	10	yes	unique
Name		varchar	30	yes	
Email		varchar	100	yes	
Phone		int	15	yes	
Date_of_Birth		date	50	yes	

Courses:

Attribute Name	Key	Type	Size	Required	Validation
Course_ID	pk	int	10	yes	unique
Course_Name		varchar	30	yes	
Credits		int	1	yes	
Department		varchar	30	no	
Instructor_ID	fk	int	10	no	

Instructors:

Attribute Name	Key	Type	Size	Required	Validation
Instructor_ID	pk	int	10	yes	unique
Name		varchar	30	yes	
Email		varchar	50	yes	
Office_Room		int	10	no	

ER Diagram:

Students to Course cardinality is Many-to-Many relationships
Instructor to Course cardinality is One-to-Many relationships