CS403P Assignment 1 Solution - Fall 2026

CS403P - Database Management System (Practical) | Assignment No. 01 (Graded)

Scenario Summary

A university maintains records of students, courses, instructors, departments, and textbooks. The assignment asks for a complete Entity Relationship Diagram (ERD) for this university database: identify the entities, give each entity its attributes and primary key, identify the relationships between the entities, and draw the final ERD using Chen notation.

Step 1: Identified Entities

The scenario names five entities that must be stored in the database:

Entity	Description
Student	A student enrolled at the university.
Course	A course offered by the university.
Instructor	An instructor who teaches courses.
Department	An academic department that offers courses.
Textbook	A textbook used in a course.

Step 2: Attributes and Primary Keys

The scenario names the entities but does not give a complete attribute list, so the attributes below are reasonable example attributes. Each entity gets a unique primary key so that every row can be identified on its own.

Entity	Attributes	Primary Key
Student	StudentID, StudentName, Email, DateOfBirth	StudentID
Course	CourseID, CourseName, CreditHours, CourseCode	CourseID
Instructor	InstructorID, InstructorName, Email, Office	InstructorID
Department	DepartmentID, DepartmentName, Office	DepartmentID
Textbook	TextbookID, Title, Author, ISBN, Publisher	TextbookID

Step 3: Relationships

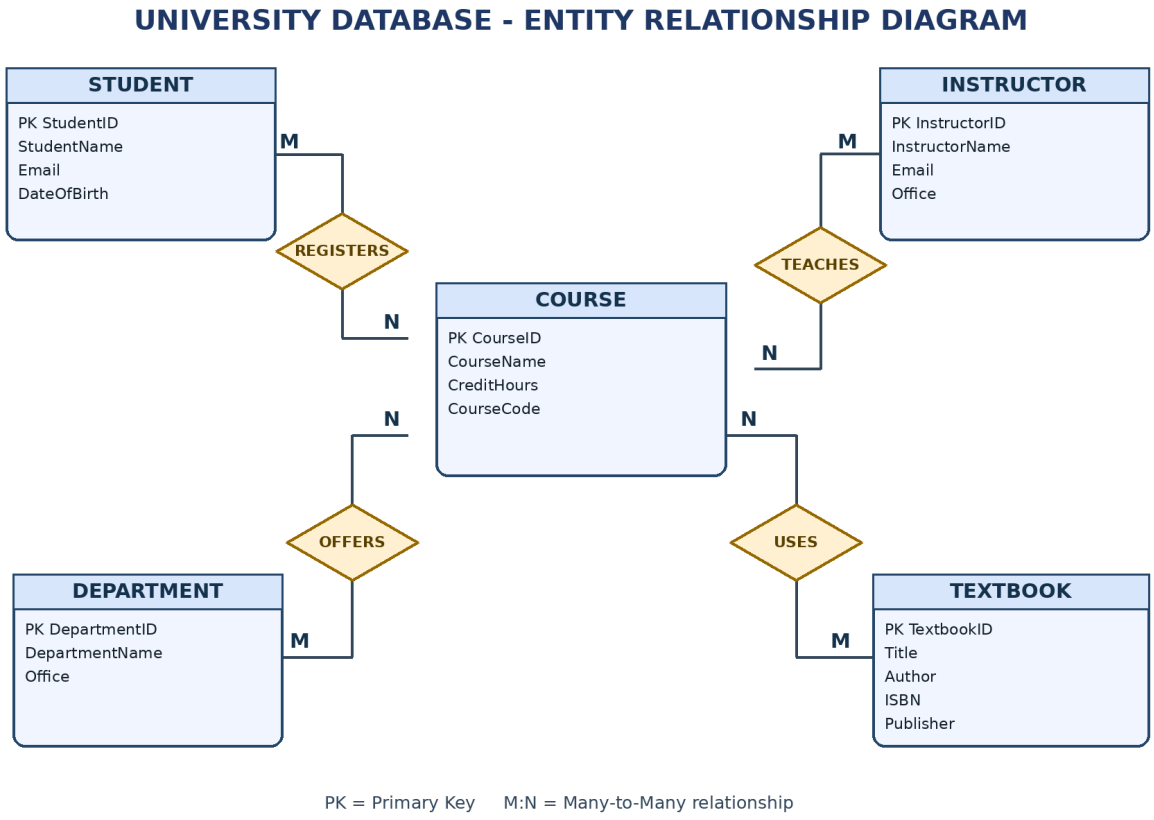
All four relationships in this design are many-to-many (M:N). Each one is justified below:

Entity 1	Relationship	Entity 2	Cardinality and Reason
Student	Registers	Course	M:N - one student can register for many

			courses, and one course can have many students.
Instructor	Teaches	Course	M:N - one instructor can teach many courses, and one course can be taught by many instructors (for example, different sections).
Department	Offers	Course	M:N - one department can offer many courses, and one course can be offered by many departments (for example, cross-listed courses).
Course	Uses	Textbook	M:N - one course can use many textbooks, and one textbook can be used by many courses.

Step 4: Entity Relationship Diagram (ERD)

The diagram below shows the five entities with their attributes and primary keys (PK), and the four many-to-many relationships. Rectangles are entities, diamonds are relationships, and the M and N labels show the many-to-many cardinality on each side.



Step 5: From ERD to Tables (Implementation Note)

A relational database cannot store a many-to-many relationship directly between two tables. Each M:N relationship is implemented with a junction (associative) table that holds the two primary keys as foreign keys:

Relationship	Junction Table	Contents
Student - Course	Registration	StudentID, CourseID
Instructor - Course	Teaching	InstructorID, CourseID
Department - Course	Offering	DepartmentID, CourseID
Course - Textbook	CourseTextbook	CourseID, TextbookID

With these junction tables in place, every many-to-many relationship becomes two one-to-many relationships, and the design is ready to implement in any relational database.

Conclusion

The ERD captures all five entities and the four many-to-many relationships described in the scenario. If your assignment file on VULMS lists different attributes or relationships, adjust the diagram to match your own file, and fill in your own name and student ID before submitting. VU accepts assignments only as .doc or .docx files, so save your file with your VU ID.