



Relational Database Concepts

Introduction to Entity Relationship Diagrams

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Objectives

- Understand the components of ERD diagrams.
- Learn how to create them.



Understanding ERD

Entity relationship Diagrams (ERDs) are made up of three parts:

- Entity types
- Relationships
- Attributes.



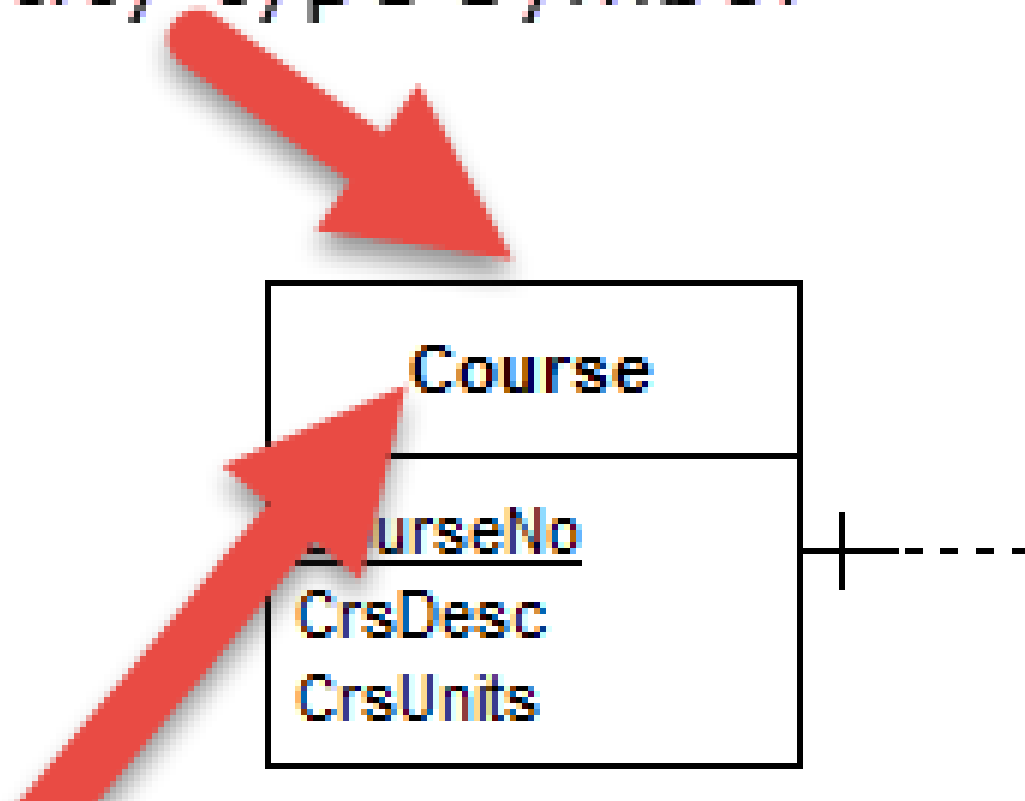
Entity types

- Entity types are collections of things of interest (entities) in an application.
- Entity types represent collections of physical things such as books, people, and places, as well as events such as payments.
- An entity is a member or instance of an entity type.
- Entities are uniquely identified to allow tracking across business processes. For example, Students have a unique identification to support registration, course scheduling, faculty assignment, and grade recording processing.

Entity types

- In the Crow's Foot notation as well as most other notations, rectangles denote entity types as shown in the COURSE Entity Type below and represents the set of courses in the database.

Entity type symbol

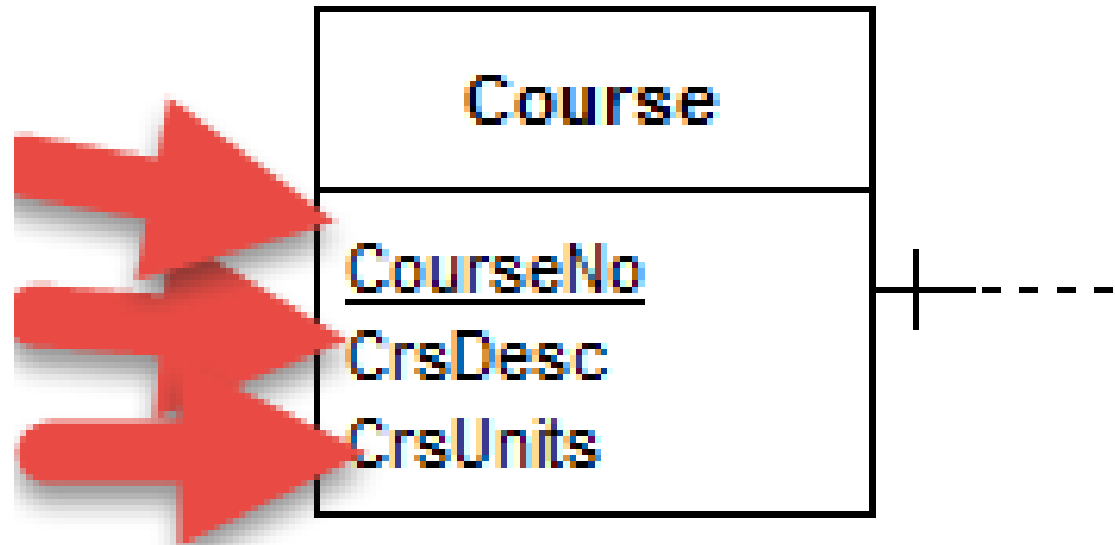




Attributes

- Attributes are properties of entity types or relationships.
- An entity type should have a primary key as well as other descriptive attributes.
- Attributes are shown inside an entity type rectangle.
- If there are many attributes, the attributes can be suppressed and listed on a separate page.
- Underlining indicates that the attribute(s) serves as the primary key of the entity type as shown below.

Attributes



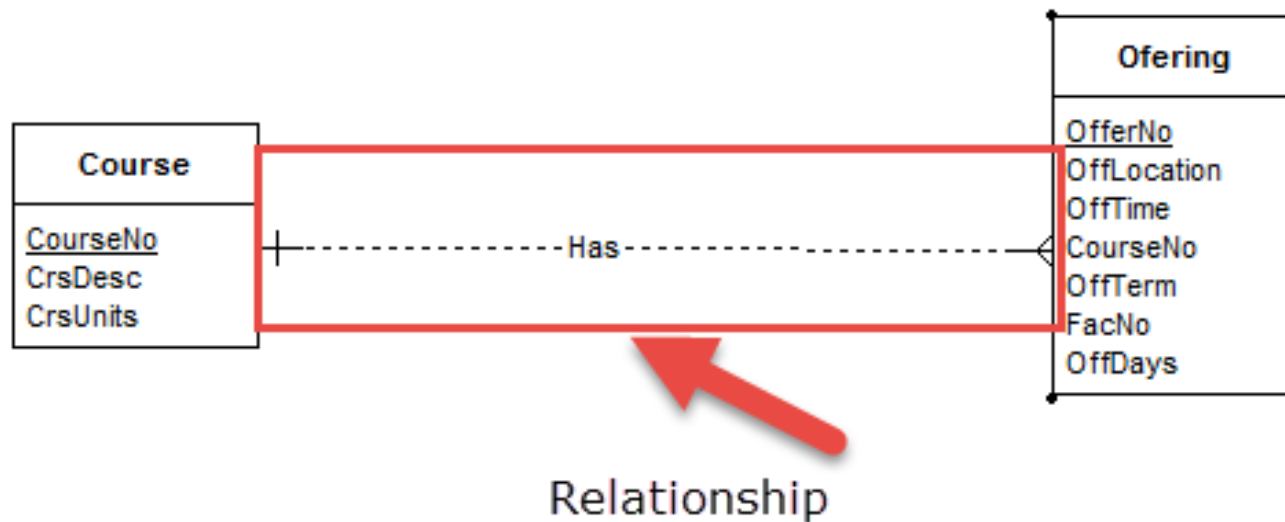
Attributes

Relationships



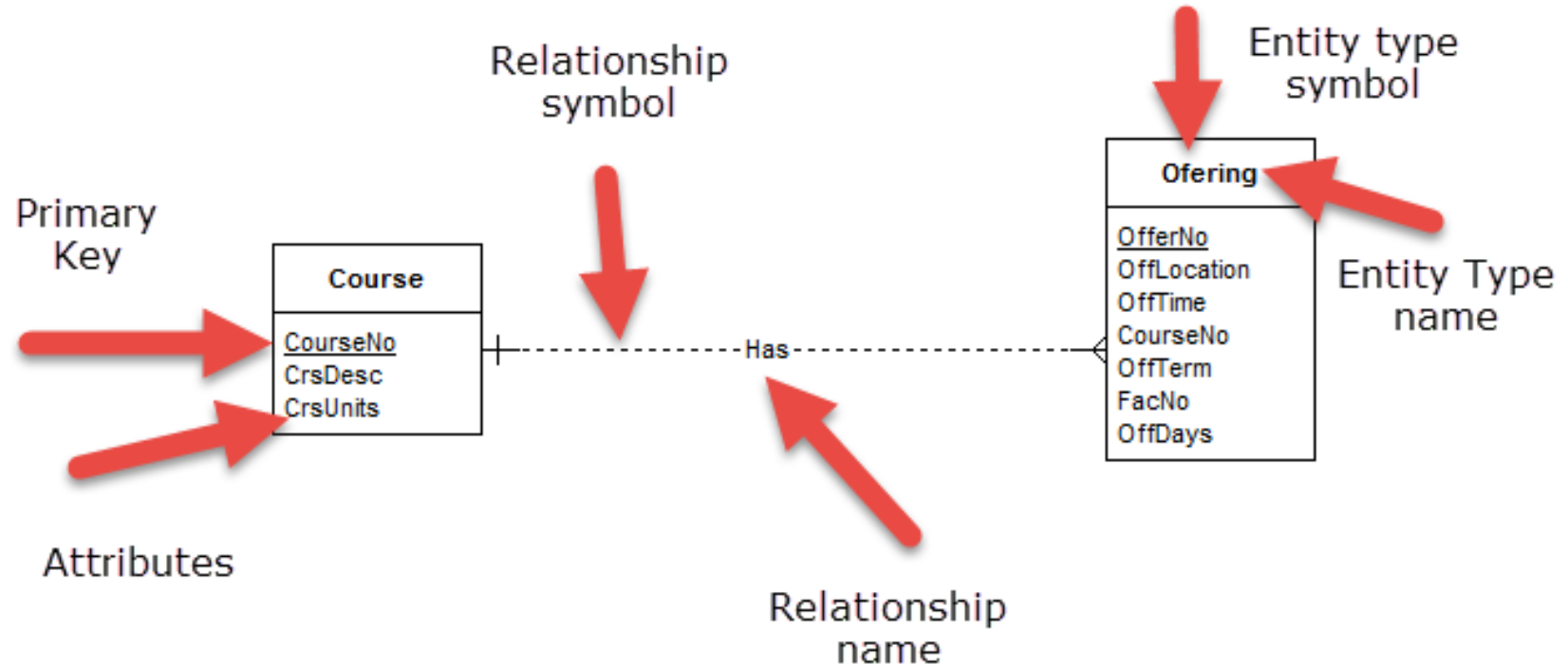
- Relationships are named associations among entity types. In the Crow's Foot notation, relationship names appear on the line connecting the entity types involved in the relationship.
- In the ERD notation below, you can see that the Has relationship shows that the Course and Offering entity types are directly related.
- Relationships store associations in both directions. For example, the Has relationship shows the offerings for a given course and the associated course for a given offering.
- The Has relationship is binary because it involves two entity types.
- Entity types can correspond to nouns and relationships to verbs or prepositional phrases connecting nouns.
- Relationship diagrams are just a collection of sentences.

Relationships



Relationships

- In this sense, one can read an entity relationship diagram as a collection of sentences. For example, the ERD notation below can be read as “course has offerings.” Note that there is an implied direction in each relationship and “an offering is given for a course.”



Relationships

- Tip: When creating relationships names for your entity types, use active rather than passive verbs.

