

Entity Relationship (ER)

1. **Simple** = Single Atomic Value (**just Oval**)
2. **MultiValued** = Multiple values (**Double Oval**)
3. **Composite** = Connected by other entity [Adress] (**Oval connected with Ovals**)
4. **Composite – Multivalued** = is also A thing
5. **KeyAttribute** = A unique Value for each entity [Course Code , Stud_ID, RegistrationNumber]
(**underline**)
6. **Derived Attribute** = whose value can be calculated from other stored data (e.g., Age can be derived from DateOfBirth). This value is not stored in the database. (**Dotted oval**)
7. **Weak Entity** = These entity can not be identified alone [section] (**Double rectangle.**)
8. **Partial Key** = The entity with the unique value which is not unique to the mini world but to the Weak entity (**DottedUnderline**)
9. **Relationship**: Connection Between two or more distinct entitites [Student enrolls in Course]
(**Diamond {with the relationship}**)
10. **Relationship_attributes** = May or may not be Present [Grade for enrolls_in relationship]
11. **Degree of Relationship** = The degree is how many entity is connected to that relationship
12. **Recursive Relationship**: A relationship where entities from the *same* entity type participate, but in different roles.[Pre req courses , is under courses so relation to it self] (Role 'labels' (e.g., Prereq, Dependent) *must* be written on the relationship edges.)
13. **Identifying Relationship**: The relationship that connects a weak entity type to its "owner" (or identifying) entity type. **A weak entity *must* participate in one. (Double Diamonds)**

14. **More Weak Entity** = A weak Entity can have normal entity and relationships with other strong and weak entities . And its identifies with the combination of Partial key and identifying relation

15. **Cardinality Ratio (Maximum Participation)**: Specifies the maximum number of entities that can participate in a relationship.

(Shown with numbers (1, N, M) on the relationship edges.)

Types: One-to-one (1:1), One-to-many (1:N), and Many-to-many (M:N).

16. **Participation Constraint (Minimum Participation)**: Specifies whether participation is optional or mandatory.

There are two types.

Zero (optional participation) = Relationship edge is (**indicated by a single line**) in the ER. [Example, a student is optional to become an ST of a course, and also every course does not require an ST.]

One or more (mandatory participation) (**indicated with double lines in relationship edge**) [It is mandatory for every course to have a coordinator, but it is not mandatory for every faculty to be a coordinator of a specific course].

So there's gonna be a line from course to coordinator and coordinator to faculty. Course to coordinator will be a double line. Coordinator to faculty is gonna be a single line. The thing coordinator is a diamond noting as a relationship.