ER Model: Entity Relationship model. It facilitate database design by allowing specification of an *enterprise schema* that represents the overall logical structure of a database.

* **Entity Relationship diagrams** – logical structure graphically
* **Entity**: object / thing /person
* Weak Entity
* **Entity Set**: set of entities of same type
* **Attribute**s: Descriptive properties of entities/entity set
* Simple vs Composite Attribute
* Single Valued vs Multivalued Attribute
* Derived Attribute
* **Value**: Each entity has a value for each of its attributes.
* **Relationship**: One to one, One to Many, Many to One, Many to Many.

MINIMIZATION of ER Model - Book

EXTENDED ER Features

* **Specialization**: Process of identifying subsets of an entity that share some different characteristic. It is a top down approach in which one entity is broken down into low level entity.
* Overlapping Specialization
* Disjoint Specialization
* Superclass – Subclass Relationship
* **Generalization**: Process of generalizing an entity which contains generalized attributes or properties of generalized entities. It is a Bottom up process.
* **Aggregation:** Represents relationship between a whole object and its component. Aggregation is an abstraction through which relationships are treated as higher level entities.

RECURSIVE RELATIONSHIP:

* A relationship between two entities of a similar entity type is called a recursive relationship.
* Here the same entity type participates more than once in a relationship type with a different role for each instance.
* In other words, a relationship has always been between occurrences in two different entities.
* However, the same entity can participate in the relationship.
* This is termed a **recursive** relationship.

IMPEDENCE MATCHING:

* Impedance mismatch is the term used to refer to the problems that occurs due to differences between the database model and the programming language model.
* The practical relational model has 3 components these are:
  + Attributes and their data types
  + Tuples
  + Tables
* Data type mismatch means the programming language attribute data type may differ from the attribute data type in the data model.
* The results of most queries are sets or multisets of tuples and each tuple is formed of a sequence of attribute values. In the program, it is necessary to access the individual data values within individual tuples for printing or processing.
* Impedance mismatch is less of a problem when a special database programming language is designed that uses the same data model and data type as a database model for example Oracles’sPL/SQL.