# Software Design and Architecture

## Unified Modeling Language

- Unified Modeling Language (UML) is a standardized general-purpose modeling language in the field of software engineering.
- The Unified Modeling Language (UML) is used to
  - specify,
  - visualize,
  - modify,
  - construct and
  - document
- the artifacts of an object-oriented software-intensive system under development.

# UML Diagrams

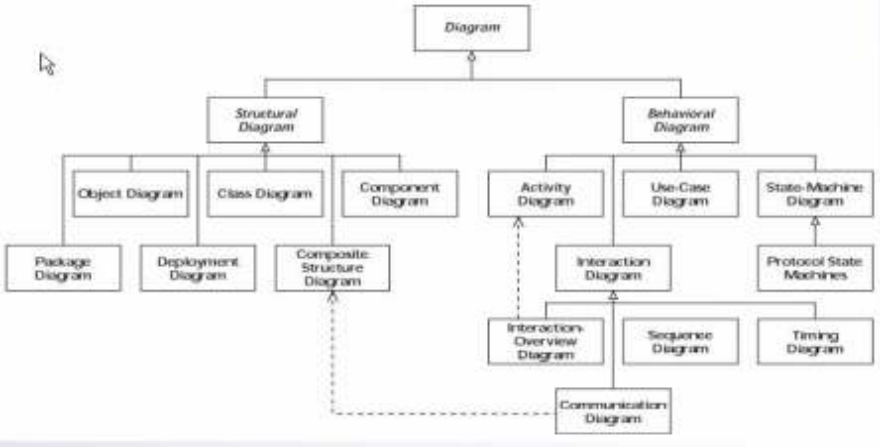
- UML models the system to be built by following diagrams:
  - Use Case Diagrams
  - Class Diagrams
  - Interaction Diagrams - Sequence & Collaboration
  - Activity & State Diagrams
  - Implementation Diagrams - Component & Deployment



# UML Diagrams

- UML diagrams represent two different views of a system model :
- Static (or *structural*) view:
  - emphasizes the static structure of the system using objects, attributes, operations and relationships.
  - The structural view includes class diagrams and composite structure diagrams.
- Dynamic (or *behavioral*) view:
  - emphasizes the dynamic behavior of the system by showing collaborations among objects and changes to the internal states of objects.
  - This view includes sequence diagrams, activity diagrams and state machine diagrams.

## UML Diagrams




## Flowchart

- A flowchart is a type of diagram that represents an algorithm or process, showing the steps as boxes of various kinds, and their order by connecting these with arrows.
- This diagrammatic representation can give a step-by-step solution to a given problem.
- Flowcharts are used in analyzing, designing, documenting or managing a process or program in various fields.

- Process operations are represented in these boxes,
- Arrows connecting them represent flow of control.

- Example:
  - Algorithm for calculating factorial.
    - Read input
    - Initialize variables
    - Multiply factorial
    - Check terminating condition
    - Print results