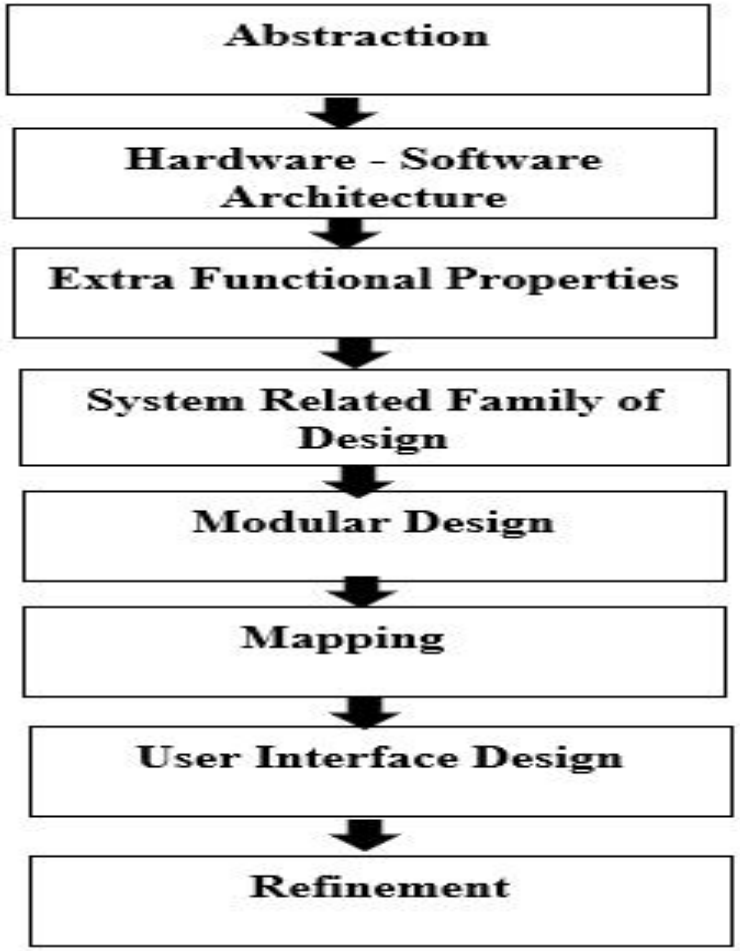
## EMBEDDED SYSTEM DESIGN PROCESS

- Performance.
  - Overall speed, deadlines.
- Manufacturing cost.
- Power consumption.
- Functionality and user interface.
- Other requirements (physical size, etc.)


Abstraction
Hardware – Software Architecture
Extra Functional Properties
System Related Family of Design
Modular Design
Mapping
User Interface Design
Refinement

## TOP-DOWN VS. BOTTOM-UP

- Top-down design:
  - start from most abstract description;
  - work to most detailed.
- Bottom-up design:
  - work from small components to big system.
- Real design uses both techniques.

**Abstraction**

In this stage the problem related to the system is abstracted.

**Hardware – Software Architecture**

Proper knowledge of hardware and software to be known before starting any design process.

**Extra Functional Properties**

Extra functions to be implemented are to be understood completely from the main design.

**System Related Family of Design**

When designing a system, one should refer to a previous system-related family of design.

**Modular Design**

Separate module designs must be made so that they can be used later on when required.

**Mapping**

Based on software mapping is done. For example, data flow and program flow are mapped into one.

- Plain language description of what the user wants and expects to get.
- May be developed in several ways:
  - talking directly to customers;
  - talking to marketing representatives;
  - providing prototypes to users for comment.

## FUNCTIONAL VS NON-FUNCTIONAL REQUIREMENTS

- Functional requirements:
  - output as a function of input.
- Non-functional requirements:
  - time required to computeoutput;
  - size, weight, etc.;
  - power consumption;
  - reliability;
  - Performance -Speed
  - Cost – Manufacturing Cost and Nonrecurring Engineering cost

# Thank you