1. During **problem definition** we clarify the client's objectives and gather the information needed to develop an engineering statement of the client's wants.

   **Input:** client's statement  
   **Tasks:** clarify design objectives (1)  
             establish user requirements (2)  
             identify constraints (3)  
             establish functions (4)  
   **Output:** revised problem statement  
             refined objectives  
             constraints  
             user requirements  
             functions

2. In the **conceptual design** stage of the design process we generate concepts or schemes of candidate designs.

   **Input:** revised problem statement  
             refined objectives  
             constraints  
             user requirements  
             functions  
   **Tasks:** establish design specifications (5)  
             generate design alternatives (6)  
   **Output:** conceptual design(s) or scheme(s)  
             design specifications
3. In the preliminary design phase we identify the principal attributes of the design concepts or schemes.
   - Input: conceptual design(s) or scheme(s) design specifications
   - Tasks: model, analyze conceptual designs (7) test, evaluate conceptual designs (8)
   - Output: a selected design test-and-evaluation results

4. During detailed design we refine and detail the final design.
   - Input: selected design test-and-evaluation results
   - Task: refine and optimize the chosen design (9)
   - Output: proposed fabrication specifications final design review for client

5. Finally, during the design communication phase we document the fabrication specifications and their justification.
   - Input: fabrication specifications
   - Task: document the completed design (10)
   - Output: final report to client containing
     (1) fabrication specifications
     (2) justification for fabrication specs

Client Statement (Need) → Problem Definition Tasks 1–4
→ Conceptual Design Tasks 5–6
→ Preliminary Design Tasks 7–8
→ Detailed Design Task 9
Final Design (Fabrication Specs & Documentation) → Design Communication Task 10
Product (Designed Object)
Project Definition
- Client's feasibility study
- Orientation meeting
- Defined scope, budget, and schedule

Project Framework
- Work breakdown
- Project team

Project Scheduling
- Assignment of tasks
- Scheduling resources and tasks
- Scheduling costs

Project Tracking, Evaluation, and Control
- Tracking work, time, and cost
- Comparison with work plan
- Analysis of trends
- Revision of plans