

Çankaya University
Mechanical Engineering Department
ME 102 Mechanical Engineering Orientation
HW 1-Solutions

Q-1 What are the phases of design?

1. Requirements Development

Engineering design begins when a basic need is identified: Recognize need, identify the problem and define the requirements

2. Conceptual Design

In this stage, design engineers collaboratively and creatively generate a wide range of potential solutions to the problem at hand and then select the most promising one(s) to develop

3. Detailed Design

The team defines, innovates, analyzes, and converges its way to the best concept.

- Developing product layout and configuration
- Selecting materials for each component
- Addressing design for reliability, manufacturing, assembly, variation, costing, recycling
- Optimizing the final geometry with appropriate tolerances
- Developing completed digital models of all components and assemblies
- Simulating the system using models
- Prototyping and testing critical components and modules
- Developing the production plans

4. Production

Once the detailed design has been completed, a designer becomes involved with the fabrication and production of the product.

Type of production and production volume is defined, supplier selection is done.

Q-2 What do you understand from “Innovative design” ?

Design Innovation is about coming up with new ideas and products, about changes that lead to growth and differentiation. Innovation means change, experimentation, and new ideas may be risky. If you are committed to developing new products and services you really need to develop a new and understandable process.

Q-3 Why do we need Patents?

An inventor is granted the legal right to exclude others from making, using, offering for sale, selling, or importing his invention with the help of patents. They are a key aspect of the business side of engineering because they provide legal protection for the inventors of new technology.