



Mechanical Engineering

## Design Thinking in Mechanical Engineering

## Course Introduction

---

Design thinking is a powerful problem-solving approach that focuses on understanding user needs, prototyping, and testing to create innovative solutions. In mechanical engineering, design thinking can drive more creative, user-centered designs that improve the functionality, usability, and efficiency of products. It encourages engineers to step out of traditional engineering mindsets and focus on real-world challenges, creating solutions that are not only technically feasible but also meet user needs and expectations. Design thinking is essential for tackling complex engineering problems in industries such as automotive, aerospace, and consumer products. By embracing this approach, engineers can develop more effective, sustainable, and impactful solutions.

This program will introduce participants to the design thinking process and its application in mechanical engineering. It will cover each phase of the design thinking methodology, from empathizing with users and defining problems to ideating and prototyping solutions. The course will also highlight the importance of testing, iteration, and collaboration throughout the design process.

## Target Audience

---

This course is designed for mechanical engineers, designers, and professionals interested in applying design thinking to mechanical engineering projects.

## Learning Objectives

---

- Understand the core principles of design thinking and how they apply to mechanical engineering.
- Learn the techniques for empathizing with users and defining engineering problems from a user-centered perspective.
- Develop creative ideation skills to generate innovative solutions to engineering challenges.

- Gain experience in prototyping and testing solutions to validate concepts and improve designs.
- Learn how to iterate on designs and implement user feedback to create practical and effective mechanical solutions.

## Course Outline

---

### • 01 DAY ONE

#### Introduction to Design Thinking in Mechanical Engineering

- What is design thinking and its importance in mechanical engineering
- The five phases of design thinking: Empathize, Define, Ideate, Prototype, Test
- Why traditional engineering approaches may not always meet user needs
- The benefits of human-centered design in engineering
- Real-world examples of design thinking in mechanical engineering
- Overview of the design thinking mindset and its role in innovation
- How design thinking complements traditional engineering processes

### • 02 DAY TWO

#### Empathy and Problem Definition

- The importance of empathy in the design thinking process
- Techniques for gathering insights from users and stakeholders
- Conducting interviews, surveys, and observations to understand user needs
- Identifying user pain points and challenges
- Defining the problem statement based on user insights
- Framing the right questions to guide the design process

### • 03 DAY THREE

#### Ideation and Concept Development

- Techniques for generating creative ideas (brainstorming, mind mapping, SCAMPER)
- How to overcome creative blocks and encourage innovative thinking
- Prioritizing ideas based on feasibility, desirability, and viability
- Developing early-stage concepts and sketching solutions
- Collaborative ideation and teamwork in the design process
- Refining concepts and selecting the best ideas for prototyping

• 04 DAY FOUR

Prototyping and Testing Solutions

- The role of prototyping in the design thinking process
- Types of prototypes: low-fidelity vs. high-fidelity
- Tools and materials for rapid prototyping in mechanical engineering
- How to test prototypes to gather feedback and insights
- Iteration and refinement based on testing results
- The importance of failing early and learning from mistakes

• 05 DAY FIVE

Iteration, Implementation, and Finalizing Solutions

- Analyzing feedback and iterating on designs to improve performance
- How to scale prototypes into final products
- Integrating design thinking into project development cycles
- Collaborative teamwork and stakeholder communication throughout the process
- Implementing user feedback and ensuring long-term product success

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
June 30, 2025	July 4, 2025	5 days	4250.00 \$	UAE - Abu Dhabi
Sept. 29, 2025	Oct. 3, 2025	5 days	5950.00 \$	USA - Los Angeles
Dec. 15, 2025	Dec. 19, 2025	5 days	4250.00 \$	UAE - Dubai