

<b>Name of Program</b>	<b>B. Tech</b>	<b>Semester- IV</b>	<b>Year- II</b>
<b>Name of Course</b>	<b>Fundamentals of Design</b>		
<b>Course Code</b>	<b>ME 252</b>		
<b>Core / Elective / Other</b>	<b>CORE</b>		

**Prerequisite if any:**

1. NIL

**Course Outcomes:**

- CO1 Develop a strong understanding of the design process and apply it in a variety of business settings
- CO2 Analyse self, culture, teamwork to work in a multidisciplinary environment and exhibit empathetic behavior
- CO3 Formulate specific problem statements of real time issues and generate innovative ideas using design tools
- CO4 Apply critical thinking skills in order to arrive at the root cause from a set of likely causes
- CO5 Demonstrate an enhanced ability to apply design thinking skills for evaluation of claims and arguments

**Description of Contents in brief:**

- Unit 1.** Introduction to design thinking, traditional problem solving versus design thinking, history of design thinking, wicked problems. Innovation and creativity, the role of innovation and creativity in organizations, creativity in teams and their environments, design mind-set. Introduction to elements and principles of design, 13 Musical Notes for Design Mind-set, Examples of Great Design, Design Approaches across the world.
- Unit 2.** Understanding humans as a combination of I (self) and body, basic physical needs up to actualization, prosperity, the gap between desires and actualization. Understanding culture in family society, institution, startup, socialization process. Ethical behavior: effects on self, society, understanding core values and feelings, negative sentiments and how to overcome them, definite human conduct: universal human goal, developing human Consciousness in values, policy, and character. Understand stakeholders, techniques to empathize, identify key user problems. Empathy tools-Interviews, empathy maps, emotional mapping, immersion and observations, customer journey maps, and brainstorming, Classifying insights after Observations, Classifying Stakeholders, Do's & Don'ts for Brainstorming, Individual activity- 'Moccasin walk'
- Unit 3.** Defining the problem statement, creating personas, Point of View (POV) statements. Research- identifying drivers, information gathering, target groups, samples, and feedbacks. Idea Generation-basic design directions, Themes of Thinking, inspirations and references, brainstorming, inclusion, sketching and presenting ideas, idea evaluation, double diamond approach, analyze – four W's, 5 why's, "How Might We", Defining the problem using Ice-Cream Sticks, Metaphor & Random Association Technique, Mind-Map, ideation activity games - six thinking hats, million-dollar idea, introduction to visual collaboration and brainstorming tools - Mural, JamBoard
- Unit 4.** Fundamental concepts of critical thinking, the difference between critical and ordinary thinking, characteristics of critical thinkers, critical thinking skill slinking ideas, structuring arguments, recognizing incongruences, five pillars of critical thinking, argumentation versus rhetoric, cognitive bias, tribalism, and politics. Case study on

applying critical thinking on different scenarios.

- Unit 5.** The argument, claim, and statement, identifying premises and conclusion, truth and logic conditions, valid/invalid arguments, strong/weak arguments, deductive argument, argument diagrams, logical reasoning, scientific reasoning, logical fallacies, propositional logic, probability, and judgment, obstacles to critical thinking. Group activity/role plays on evaluating arguments.

**List of Text Books:**

1. 101 Design Methods A Structured Approach for Driving Innovation in Your Organization, Vijay Kumar, John Wiley and Sons Inc, New Jersey
2. Foundations of Ethics and Management BP Banerjee, Excel Books
3. Design Thinking Gavin Ambrose and Paul Harris, AVA Publishing SA
4. Design of Business: Roger L. Martin, Harvard Business Press, Boston MA
5. Engineering Design G.E. Dieter

**URLs:**

1. <https://nptel.ac.in/courses/110/106/110106124/>
2. <https://www.youtube.com/c/UniversalHumanValues>