

**DESIGN THINKING**

<b>Course Code</b>	20ME2501A	<b>Year</b>	III	<b>Semester</b>	I
<b>Course Category</b>	Open Elective-I	<b>Offering Branch</b>	ME	<b>Course Type</b>	Theory
<b>Credits</b>	3	<b>L-T-P</b>	3-0-0	<b>Pre-requisites</b>	Nil
<b>Continuous Internal Evaluation</b>	30	<b>Semester End Evaluation</b>	70	<b>Total Marks</b>	100

**Course Outcomes:** Upon successful completion of the course, the student will be able to

CO	Statement	Skill	BTS	Units
CO1	Understand the principles of design thinking and its approaches	Understand	L2	1,2,3,4,5
CO2	Apply the empathy, the Define phase and develop an idea through ideation Techniques in human-centered design problems.	Apply	L3	1,2,3
CO3	Apply the design thinking techniques for innovation processes	Apply	L3	1,5
CO4	Analyze the prototype and test in a design thinking context.	Analyze	L4	1,4

**Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3: High, 2: Moderate, 1: Low)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3			2	2		3	3	2	2	2	3	3	
CO2	3			2	2		3	3	2	2	1	3	3	
CO3	3			2	2		3	3	3	2	1	3	3	
CO4	3			2	2		3	3	2	2	1	3	3	

**Syllabus**

Unit	Contents	Mapped CO
I	<b>Introduction to Design Thinking</b> An insight into Design, Design Methodology, the origin of Design thinking, Design thinking Vs Engineering thinking, the importance of Design Thinking, Design Vs Design thinking, understanding Design thinking and its various process models or frameworks, Stanford process models and its five stages, features of design thinking, application of Design thinking	CO1 CO2 CO3 CO4
II	<b>Empathize in Design Thinking:</b> Human-Centered Design (HCD) process, explanation of HCD design thinking with examples, Role of Empathy in design thinking, persona creation and its importance, tools of empathy: Empathy maps, advantages and disadvantages of empathy maps, Customer journey map and its advantages & disadvantages, Mind Maps, and its uses, understanding empathy tools.	CO1 CO2
III	<b>Define Phase and Ideation:</b> Explore define phase in Design Thinking, Methods of Define phase. Introduction to ideation Methods, convention methods for ideation, intuitive methods: Brainstorming, storyboard telling, select ideas from ideation Methods: Bingo Selection, Six Thinking Hats.	CO1 CO2
IV	<b>Prototyping and Testing:</b>	CO1

	Prototyping and methods of prototyping, Difference between low fidelity and high-fidelity prototypes, paper prototyping, techniques for implementing paper prototyping, Digital prototyping, user testing methods, Advantages, and disadvantages of user Testing/ Validation	<b>CO4</b>
<b>V</b>	<b>Design Thinking for Innovation:</b> Innovation in Design Thinking, Definition of innovation, the art of innovation, types of innovations, product innovation, process innovation, and organizational innovation, characteristics of innovation, levels of innovation, Innovation towards design, Case studies	<b>CO1 CO3</b>

### Learning Resources

#### Text books:

1. Changebydesign, Tim Brown, 2009, HarperCollins
2. Engineering design, George E Dieter, 4th Revised edition, 2009 McGraw Hill.

#### Reference books

1. Design Thinking for Strategic Innovation, Idris Mootee, 2013, John Wiley & Sons
2. Design Thinking- The Guidebook – Facilitated by the Royal Civil Service Commission, Bhutan
3. Design Methods: A Structured Approach for Driving Innovation in Your Organization, Vijay Kumar, First Edition, 2012, Wiley
4. Human-Centered Design Toolkit: An Open Source Toolkit to Inspire New Solutions in the Developing World, IDEO, Second Edition, 2011, IDEO

#### e- Resources & other digital material

1. <https://www.interaction-design.org/literature/topics/design-thinking>
2. <https://www.interaction-design.org/literature/article/how-to-approach-in-design-thinking>