DESIGN THINKING

Course Code	20ME2501A	**Year**	III	**Semester**	I
Course Category	Open Elective	**Branch**	ECE	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Pre-requisites**	-
Continuous Internal Evaluation:	30	**Semester End Evaluation:**	70	**Total Marks:**	100

Course Outcomes		
Upon successful completion of the course, the student will be able to		Blooms Level
CO1	Understand the principles of design thinking and its approaches	L2
CO2	Apply the empathy, the Define phase and develop an idea through ideation Techniques in human-centered design problems.	L3
CO3	Apply the design thinking techniques for innovation processes	L3
CO4	Analyze the prototype and test in a design thinking context.	L4

Contribution of Course Outcomes towards achievement of Program Outcomes														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1			3			2	2		3	3	2	2	2	3
CO2			3			2	2		3	3	2	2	1	3
CO3			3			2	2		3	3	3	2	1	3
CO4			3			2	2		3	3	2	2	1	3

Course Content		
Unit No	**Contents**	**Mapped CO**
I	**Introduction to Design Thinking** 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**

II	**Empathize in Design Thinking:** 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	**Define Phase and Ideation:** 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	**Prototyping and Testing**: 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	**CO1, CO3**
V	**Design Thinking for Innovation**: 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	**CO1, CO3**

Learning Resources
Text books:
1. Changebydesign,Tim Brown,2009, Harper Collins 2. Engineering design, George E Dieter,4th Revisededition,2009 McGraw Hill.
Reference books
1. Design Thinking for Strategic Innovation, Idris Mootee,2013, JohnWiley&Sons 2. DesignThinking-TheGuidebook–Facilitated by the Royal Civil service Commission, Bhutan 3. Design Methods: A Structured Approach for Driving Innovation in Your Organization, Vijay Kumar, FirstEdition, 2012, Wiley 4. Human-Centered Design Toolkit: An Open-Source Toolkit to Inspire New Solutions in the Developing World,IDEO,SecondEdition,2011, IDEO
e- Resources & other digital material
1. https://www.interaction-desiqn.ora/literature/topics/desiqn-thinkinq 2. https://www.interaction-desiqn.prq/literature/article/how-tq-<eve'op-an empath\capproach-in-design-thinking