DESIGN THINKING

Course Code	19ES1302	**Year**	II	**Semester**	I
Course Category	Engineering Sciences	**Branch**	ME	**Course Type**	Theory
Credits	2	**L – T – P**	2 – 0 – 0	**Prerequisites**	Nil
Continuous Internal Evaluation	30	**Semester End Evaluation**	70	**Total Marks**	100

Course Outcomes		**Levels**
After successful completion of the course, the student will be able to		
CO1	Explain the principles of design thinking and its approaches	L2
CO2	Identify the empathy, define phases in human centered design problems.	L2
CO3	Develop an idea, build a prototype and test in design thinking context.	L3
CO4	Implement design thinking techniques for product innovation	L3
CO5	Use design thinking in business process models.	L3

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

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1			3			1						1	1	2
CO2			3	2		1			2	2		1	1	2
CO3			3	2		1			3	2		1	1	2
CO4			3	2		1			2	2		1	1	2
CO5			3	2		1			2	2	1	1	1	2

Unit No.	**Contents**	**Mapped COs**
I	**INTRODUCTION TO DESIGN THINKING** An insight into Design, origin of Design thinking, Design thinking Vs Engineering thinking, importance of Design thinking, Design Vs Design thinking, understanding Design thinking and its process models, application of Design thinking	CO1
II	**EMPATHIZE IN DESIGN THINKING:** Human-Centered Design (HCD) process - Empathize, Define, Ideate, Prototype and Test and Iterate. Role of Empathy in design thinking, methods and tools of empathy, understanding empathy tools. Explore define phase state users' needs and problems using empathy methods	CO2
III	**IDEATION, PROTOTYPING AND TESTING:** Ideation methods, brain storming, advantages of brain storming, methods and tools of ideations, prototyping and methods of prototyping, user testing methods, Advantages and disadvantages of user Testing/ Validation	CO3

IV	**PRODUCT INNOVATION:** Design thinking for strategic innovation, Definition of innovation, art of innovation, teams for innovation, materials and innovation in materials, definition of product and its classification. Innovation towards product design Case studies	CO4
V	**DESIGN THINKING IN BUSINESS PROCESSES:** Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business – Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme competition, Standardization. Design thinking to meet corporate needs.	CO5

Learning Recourse(s)

Text Book(s)

1. Change by design, Tim Brown, 2009, Harper Collins
2. Engineering design, GeorgeE Dieter,4th Revised edition, 2009 McGraw Hill

Reference Book(s)

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- desiqn.ora/literature/topics/desiqn-thinkinq
2. https://www.interaction- desiqn.prq/literature/article/how-tq-<eve'op-an- empath\capproach-in-design-thinking