19ES1302

Design Thinking

Offering Branches	Common to all Branches		
Course Category:	Engineering Sciences	**Credits:**	2
Course Type:	Theory	**Lecture-Tutorial-Practical:**	2-0-0
Prerequisites:	-Nil-	**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:

CO1	Explain the principles of design thinking and its approaches.	**L2**
CO2	Identify the empathy, define phases in human centered design problems.	**L3**
CO3	Develop an idea, build a prototype and test in design thinking context.	**L3**
CO4	Apply design thinking techniques for product innovation.	**L3**
CO5	Use design thinking in business process models.	**L3**

Course Content

UNIT-1	**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**
UNIT-2	**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**
UNIT-3	**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**
UNIT-4	**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**
UNIT-5	**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 Resources	
Text Books	1. Design Thinking for Strategic Innovation, Idris Mootee, 2013, John Wiley & Sons. 2. Change by design, Tim Brown, 2009, Harper Collins. 3. Design Thinking-The Guide Book – Facilitated by the Royal Civil service Commission, Bhutan 4. Engineering design, George E Dieter, 4th Revised edition, 2009 McGraw Hill.
Reference Books	1. Design Methods: A Structured Approach for Driving Innovation in Your Organization, Vijay Kumar, First Edition, 2012, Wiley. 2. 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-thinking 2. https://www.interaction-desiqn.prq/literature/article/how-tq-<eve'op-an-empath\capproach-in-design-thinking