Design Thinking and Innovation

Course Code	23ES1451	Year	II	Semester	II
Course Category	Engineering Science	Branch	ME	Course Type	Practical
Credits	2	L-T-P	1-0-2	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		BL
CO1	Define the concepts related to design thinking.	L1
CO2	Explain the fundamentals of Design Thinking and innovation.	L2
CO3	Apply the design thinking techniques for solving problems in various sectors.	L3
CO4	Analyze to work in a multidisciplinary environment.	L4
CO5	Evaluate the value of creativity.	L5

Contribution of Course outcomes towards achievement of programme outcomes & Strength of correlations (High:3, Medium: 2, Low:1)

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

Syllabus		
Unit	**Contents**	**Mapped CO**
1	**Introduction to Design Thinking:** Introduction to elements and principles of Design, basics of design - dot, line, shape, form as fundamental design components. Principles of design. Introduction to design thinking, history of Design Thinking, New materials in Industry	**CO1**
2	**Design Thinking Process:** Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions, design thinking in social innovations. Tools of design thinking - person, costumer, journey map, brainstorming, product development Activity: Every student presents their idea in three minutes, every student can present design process in the form of flow diagram or flow chart etc. Every student should explain about product development.	**CO2**
3	**Innovation:** Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations. Creativity to Innovation.	**CO2,CO3**

	Teams for innovation, Measuring the impact and value of creativity. Activity: Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation.	
4	**Product Design:** Problem formation, introduction to product design, Product strategies, Product value, Product planning, product specifications. Innovation towards product design Case studies. **Activity**: Importance of modelling, how to set specifications, Explaining their own product design	**CO3,CO4**
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. Design thinking for Start-ups. Defining and testing Business Models and Business Cases. Developing & testing prototypes. **Activity**: How to market our own product, about maintenance, Reliability and plan for startup.	**CO4,CO5**

Learning Resources
Text Book(s):
1. Tim Brown, Change by design, 1st Ed., Harper Bollins, 2009. 2. Idris Mootee, Design Thinking for Strategic Innovation, 1st Ed., Adams Media, 2014
References:
1. David Lee, Design Thinking in the Classroom, Ulysses press, 2018. 2. Shrrutin N Shetty, Design the Future, 1st Ed., Norton Press, 2018. 3. William lidwell, Kritinaholden, & Jill butter, Universal principles of design, 2nd Ed., Rockport Publishers, 2010. 4. Chesbrough.H, The era of open innovation, 2003.
e-Resources & other Digital Material
1. https://nptel.ac.in/courses/110/106/110106124/ 2. https://nptel.ac.in/courses/109/104/109104109/ 3. https://swayam.gov.in/nd1_noc19_mg60/preview 4. https://onlinecourses.nptel.ac.in/noc22_de16/preview