COEP TECHNOLOGICAL UNIVERSITY, PUNE
A Unitary Public University of Government of Maharashtra
(formerly College of Engineering Pune)
School of Transdisciplinary Sciences & Management
Wellesley Road, Chhatrapati Shivajinagar, Pune - 411005.

Course Title: Design Thinking and Idea Lab (DTIL)

Course Code	AS23003	**Scheme of Evaluation**	**CE & ESE**
Teaching Plan (L-T-P-S)=TC	0-0-2-1 = 1	**MID Semester**	Individual Assignments/Group tasks- 40 marks Class/team participation- 10 marks
Credits	1	**END Semester**	Project Based Learning (PBL)- 50 marks (50 – PBL & 10 participation

Syllabus:

Unit	Contents	Practical
	Part 1- THINKING (Methodology of Design Thinking)	
01.	**An Insight to Learning** Experiential Learning Styles, Self-assessment Psychological Principles in Design Thinking Perception & Observation, Imagination & Creative Confidence (lateral thinking & 6 thinking hats)	**4**
02.	**Design Thinking Framework** Introduction to different frameworks of DT, Stanford d. school framework Empathize, Define, Ideate, Prototype, Test Case Study: IDEO Shopping Cart, etc.	**2**
03.	**User-Design Relationship** Levels of Designs Understanding users through interviews, personas, empathy maps/affinity diagrams/journey maps and need identification	**4**
04.	**Introduction to Human Centric Tools in Design Thinking Process** Brainstorming & Mind mapping POV and HMW	**2**
	Part 2- DESIGN (Idea Lab) Applications of the Principles- Department Level	
05.	**Process of Product Design** Process of simple Product Design using real life problem statements from our daily routine activities, Design Thinking Approach, Stages of Product Design, Examples of best product designs and functions. Hands on Lab Assignment –Simple routinely used Product Design. Hands on demonstration of how to translate the ideas into physical objects. Better visualization of the ideas and concepts using, IDEA LAB/FAB LAB facilities such as Wood router, Laser cutting of thin plastic sheets, clay modelling,	**2**

	Expandable Polystyrene etc	
06.	**Prototyping** What is Prototype? Understanding necessity of making prototypes by building the prototypes for pre-selected Engineering problem, using one or combinations of the digital fabrication techniques & electronics fabrication systems.	**4**
07.	**Testing** Testing, Sample Example, Test Group Marketing Feedback, Re-Design & Re-Create	**2**
08.	**Feedback, Re-Design & Re-Create** Final Presentation – "Solving Practical Engineering Problem through Innovative Product Design & Creative Solution"	**2**

Course outcomes:

Students will be able to

CO1: Outline various learning styles and psychological principles and Infer Design Thinking principles & methodology.

CO2: Explain the levels of designs and Experiment with the process using human centric tools.

CO3: Propose real-time innovative engineering product designs and Choose appropriate frameworks, strategies, techniques for prototype development.

CO4: Appraise user feedback and Propose corrective innovative solutions to meet project requirements using critical thinking skills.

Suggested Learning Resources:

1. Norman, D. (2013). The Design of Everyday Things. Basic Books, NY.
2. Norman, D. (2004). Emotional Design. Basic Books, NY.
3. Brown, T. (2019). Change by Design. HarperCollins Publishers, NY.
4. Lal, D. M. (2021). Design Thinking- Beyond the Sticky Notes. Sage Publications India Pvt. Ltd.
5. Malik, A. D. M. (2019). Design Thinking for Educators. Notion Press, Chennai, India.
6. E. F. Crawley, "Creating the CDIO Syllabus, a universal template for engineering education," *32nd Annual Frontiers in Education*, Boston, MA, USA, 2002, pp. F3F-F3F, doi: 10.1109/FIE.2002.1158202.
7. Dym, C. L., Agogino, A. M., Eris, O., Frey, D. D., & Leifer, L. J. (2005). Engineering design thinking, teaching, and learning. *Journal of engineering education*, *94*(1), 103-120.
8. Panke, S. (2019). Design thinking in education: Perspectives, opportunities and challenges. *Open Education Studies*, *1*(1), 281-306.
9. Parmar, A. J. (2014, October). Bridging gaps in engineering education: Design thinking a critical factor for project based learning. In *2014 IEEE frontiers in education conference (FIE) proceedings* (pp. 1-8). IEEE.
10. Thompson, L., & Schonthal, D. (2020). The Social Psychology of Design Thinking. California Management Review, 62(2), 84–99. https://doi.org/10.1177/0008125619897636