EC/CE/CH/EE/ME252	DESIGN THINKING AND INNOVATION	L	T	P	C	Int	Ext
		1	-	2	2.0	30	70

Semester III [Second Year]

COURSE OBJECTIVES:

1. Identify the design thinking processes and methods.
2. Plan research activities to gather and empathize from a users viewpoint.
3. Ideate techniques to help arrive at the best solution and evaluation.
4. Identify design thinking approaches for business challenges.

COURSE OUTCOMES:

After successful completion of the course, the students are able to

1. outline the problem statement; apply the methods of Empathy on user groups
2. describe and define the problem specific to the user group.
3. apply ideation tools to generate ideas to solve the problem.
4. develop prototype and test the ideas and demonstrate storytelling ability to present the ideas.

UNIT I [CO:1] **(12)**

Introduction to Design Thinking: Definition, Need for Design Thinking, ten tools of Design Thinking, Five stages of Design Thinking process, Benefits of Design Thinking, how design Thinking differs from traditional problem solving approaches, Sustainable business model examples using Design Thinking.

Innovation: Study of Innovation, Individuals in the innovation process, Invention and innovation, Types of innovations.

Case Studies: General, Engineering and service applications.

Activities: Identify an opportunity and scope of the Project, Explore the possibilities and prepare design brief.

UNIT II [CO:2] **(12)**

Methods and tools for Empathize and Define Phases:

Empathize Phase: Methods of Empathize phase: Importance of Empathy, Techniques for conducting user Research and gathering Insights: Ask 5 Why/ 5 W+H Questions, stakeholder map, Empathy Map, Peer observation, Trend Analysis.

Define Phase: Transition from empathize phase to define phase: Analyze and synthesize the data (Step 1), Define the core problem (step 2), Identify User needs and opportunities (step 3), develop point of View (POV) (step 4).

Activities: Apply the methods of empathize and define phases, Finalize the problem statement.

UNIT III [CO:3] **(12)**

Methods and Tools for Ideate Phase and Prototype Phase:

Ideate Phase: Clear articulation of the problem statement with focus on latent needs, Techniques for Ideation: Warm up games, Brain Stroming, Six hats thinking, Mind mapping, Role playing, Storytelling, Sketching, SCAMPER, Creative matrix technique, Divergence and Convergence and Evaluation of Ideas.

Activities: Apply the methods of Ideate Phase: Generate lots of Ideas.

Prototype Phase: How prototype enhances the design thinking process, developing mockups, models and prototypes, Types of prototypes, proof of concept and prototyping, Minimum Viable Product,

developing skills for making and presenting prototypes.

Activities: Apply the methods of Prototype Phase: Create prototypes for selected Ideas.

UNIT IV [CO:4] **(12)**

Methods and Tools for Test Phase:

Test Phase: Defining testing and implementation goals, Identifying the key stakeholders of the testing stage, Key challenges in testing and implementation, Overview of piloting and launching in design thinking, Analyzing the test results, Tracking results and measuring success, leveraging Feedback and data , Avoiding the common pitfalls in testing stage.

Activities: Collect feedback; iterate and improve the Ideas.

Solution Overview: Create a Pitch-Plan for scaling up -Road map for implementation.

Activities: Present your solution using Story telling Method.

Project Submission: Fine tuning and submission of the Project.

LEARNING RESOURCES:

TEXT BOOK(s):

1. Tim Brown, Change by design, 1/e, Harper Bollins, 2009.
2. Idris Mootee, Design Thinking for Strategic Innovation, 1/e, Adams Media, 2014.

REFERENCE BOOK(s):

1. C. Subramanian, T. Paramasivan, S. Venkataramani, Design Thinking: A hands -on Approach, Universities Press, 2025.
2. David Lee, Design Thinking in the Classroom, Ulysses press, 2018
3. Shrrutin N Shetty, Design the Future, 1/e, Norton Press, 2018.
4. William lidwell, Kritinaholden, &Jill butter, Universal principles of design, 2/e, Rockport Publishers, 2010. 4. Chesbrough.H, The era of open innovation, 2003.