



# MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

## COURSE CONTENT

Design and Innovation								
III Semester: CE / CSD / CSE / CSM / ECE / EEE / ME								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P		C	CIA	SEE
243EXL1	Foundation	0	0	2	1	40	60	100
Contact Classes: 0	Tutorial Classes: Nil	Practical Classes: 30			Total Classes: 30			
Prerequisites: EPIC & I&TD								

### Course Overview:

This course introduces Design Thinking as a human-centered approach to solving real-world organizational and societal problems through empathy, creativity, and collaboration. It enables students to research stakeholder needs, define problem statements, ideate solutions, and build and test prototypes iteratively. The course also focuses on business modeling, effective communication, and fundamentals of publication and intellectual property filing.

### Course Objectives:

1. Introduce the principles, stages, and tools of Design Thinking for organizational problem-solving.
2. Enable empathy-driven research and ideation to address stakeholder needs.
3. Develop skills to build and prototype user-centric solutions collaboratively.
4. Train students to test and refine solutions through iterative feedback.
5. Guide students in business modeling, effective presentation, and basics of IP filing.

### Course Outcomes:

After Completion of the Course, Students should be able to

1. Understand the principles and process of Design Thinking and its relevance in organizational and educational contexts.
2. Apply empathy-driven research methods to understand stakeholder needs and create user personas
3. Define problem statements and ideate innovative solutions using appropriate tools and frameworks
4. Develop and test prototypes iteratively, using feedback and testing tools to refine user-centric solutions
5. Design, present, and document a viable business model with potential for publication or IP filing

### List of Experiments:

#### Week 1: Course Introduction and Project Kickoff

- Course Overview: Objectives, structure, and expectations
- Online Course Certification – Wadwani Foundations
- Team Formation: Importance of Team, Assign roles and responsibilities

- Initial Brainstorming: Discuss project ideas and start preliminary research by storytelling methods
- **Task : Team Formation**

### **Week 2: SDG Goals and Themes or challenges**

- 17 SDG Goals
- Different Themes or challenges
- Brainstorming Techniques
- **Task : SDG/Theme Proforma**

### **Week 3: What Is Design Thinking, Really? & Setting the Stage for DT**

- Define the term “design thinking.”
- Design thinking in problem-solving.
- Importance of design thinking
- Creative Thinking: How to Increase the Dots to Connect
- Traditional Problem-Solving and Design Thinking
- Perspectives of design thinking.
- **Task : Literature Survey**

### **Week 4: Establishing Mindset - IDEA**

- Ensuring the DT Mindset
- Working on the their Ideas
- **Task : Task : Abstract Submission and 9 Whys's**

### **Week 5: The DT Process—Understanding the Environment**

- DT Process
- First step of the design thinking process—exploration.
- why exploration is an important step to begin with.
- “tools” for conducting exploration.
- Frameworks for analyzing the information collected through exploration.
- Case Study: DT at HCL Technologies
- Case Study: Siemens CT, China
- **Task : STEEP Analysis**

### **Week 6: Understanding the Stakeholders' Perspective—Empathy**

- Need for “understanding the stakeholders” in design thinking process.
- Role of empathy in design thinking.
- Approaches to “empathizing” with stakeholders.
- How to create customer profiles based on empathy mapping.
- Case Study: DT at Hero MotoCorp Ltd.
- Case Study: PillPack
- **Task : Empathy map, Persona of a user, Finalize the Stakeholders/ Customer Segments**

### **Week 7: Defining the Point of View—Problem Articulation**

- “How Might we” statements
- Art of Storytelling
- Context Mapping
- Creating a critical item diagram
- Case Study: DT at Infosys
- Case Study: OPT Bank Romania
- **Task: Template for Context Mapping**

### **Week 8: Ideation**

- Ideation Techniques
- Importance of the ideation phase in the design thinking project.
- Build a buyer utility map.
- Create the lean canvas for the proposed-solution.
- Case Study: DT at Mahindra and Mahindra Group

- Case Study: In-Flight Meal Experience at L Airlines
- **Task : Evaluating the Idea: SWOT Analysis, 2\*2 Matrix, Dot Voting, NABC Method**

### **Week 9: Creating the Prototype**

- Importance of prototyping stage.
- Types of prototypes.
- Stages of prototyping and the uniqueness of each stage.
- Case Study: DT at Godrej
- Case Study: Making Sydney's King Cross Crime Free
- **Task : Any Prototyping Method, POC, 3D Model**

### **Week 10: Testing**

- Testing Phases
- Need of testing phases
- Tools for testing phase
- Techniques used in testing the prototypes.
- Case Study: DT at Paytm
- Case Study: Employment Pass Service at Singapore
- **Task : Tools for Testing Phase- Create a Template for Testing (Testing sheet, Feedback Capture Grid, A/B Testing)**

### **Week 11: BMC**

- Creating a Pitch
- Business Model Canvas and Lean Canvas
- **Task : Business Model Canvas (BMC)**

### **Week 12: Assessment, Showcase and Publication/Patenting**

- Presentation: Teams present their projects to faculty, industry professionals, and peers
- Demonstration: Showcase prototypes and explain the design process
- Publication/Patenting: selecting appropriate journals for publication

Patent application process, including patent searches, drafting patent claims, and filing procedures

### **TEXT BOOKS:**

1. Design Thinking: A Comprehensive Textbook by Shalini Rahul Tiwari, Rohit Rajendra Swarup, Wiley, 2024
2. Design Thinking: A Beginners perspective, E Balagurusamy, Bindu Vijaykumar, Mc Graw Hill, 2024

### **REFERENCE BOOKS:**

1. Design Thinking in the Classroom, David Lee, Ulysses Press, Korea, 2018

### **ELECTRONIC RESOURCES:**

1. <https://sdgs.un.org/goals>
2. <https://skilling.wadhwanifoundation.org/en/guest>
3. <https://www.youtube.com/watch?v=YXZamW4-Ysk>
4. <https://www.youtube.com/watch?v=cYhgllTy4yY>
5. <https://www.coursera.org/collections/popular-design-thinking-courses>
6. <https://alison.com/course/diploma-in-design-thinking-revised>
7. <https://www.edx.org/learn/design-thinking>
8. <https://freedesignthinking.com/>
9. <https://www.linkedin.com/learning/topics/design-thinking>

### **MATERIALS ONLINE:**

1. Lab Manual