GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme	Bachelor of Technology					Branch/Spec.	Civil Engineering		
Semester	II					Version	2.0.0.0		
Effective from Academic Year		2025-26				Effective for the batch Admitted in		July 2025	
Subject code	2HS1103	Subject Name	Critical Thinking, Design Thinking, Leadership and Teamwork						
Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	0	0	3	Theory	40	60	100
Hours	3	0	2	0	5	Practical	00	00	00

Prerequisites:

Basic Math and Logical Reasoning

Objectives of the Course:

1. Explain the benefits of Design Thinking in a structured approach of solving complex problems through capstone projects.
2. Promote the design thinking strategies for analytical and creative thinking through the product development process.
3. Offer the basic principles and methodologies of Critical Thinking for optimal Decision Making in real-world problems
4. Introduce different leadership styles and their effectiveness in various organizational contexts
5. Enhance the communication proficiency of learners

Theory syllabus

Unit	Content	Hrs.
1	**Design Thinking Fundamentals and Framework:** Fundamentals of Design Thinking, Design Thinking for complex problem solving, 7-stages of Design Thinking, Exploring solution space(C-K Theory) , Techniques of Empathy building, Empathy maps and user journey mapping, Integration of Design Thinking and Storyboarding, Design Thinking practicing case-studies, Design Thinking for Professional Skills, Design Thinking practices for Coding skill, Co-curricular skill, Technical blog writing, Designing Capstone projects, Design Thinking in industrial projects, Strategy for new technology innovations	9
2	**Design Thinking in Creativity & Innovation:**	9

	Unique characteristics of Design Thinking, Difference between Creativity and Innovation, Categories and misconceptions of creativity, Resilience in problem-solving, Analytical Thinking – Driven by Design Thinking, Waterfall models and Design Thinking, Agile Development models, Agile process integrated with Design Thinking, Design Thinking based Product development - Design methodology, Prototyping, UX design, Value proposition	
3	**Critical Thinking:** Introduction to Critical Thinking, Styles and challenges of Critical Thinking, Benefits of Critical Thinking, Identifying & clarifying issues and arguments, Types of Arguments, Common patterns of Deductive reasoning & Inductive reasoning, Reasoning with Statistics, Fallacies of Relevance, Fallacies of Insufficient Evidence, Evaluating arguments, Critical Thinking models, Principles of Decision making, De Bono's Thinking hats, Effective Argument Writing, Critical Thinking based case study analysis, Analytical view of Science & Pseudoscience based thinking	9
4	**Leadership and Teamwork:** Defining leaders and leadership, Types of leaders and leadership styles, Understanding the people, personalities and abilities, Active listening, Non - verbal communication, Feedback, Clarity, Effective teams, Stages of team development, Understanding the psychology of change for individuals and teams, Personal resilience and well- being, Feedback and feed forward, Leaders and teams: Working effectively towards common goals, Role of integrity in leadership, Embracing growth mindset in leadership, Conflict resolution and Managing team dynamics	9
5	**Verbal and Non-verbal Communication:** Verbal and non-verbal communication, LSRW skills, Assertive communication, Persuasion Skills, Interpersonal Skills, Cross-cultural communication, Emotional intelligence, Self - awareness, Interpreting body language, Active listening, Personality development, Time management and Goal setting	9

List of Tasks and Projects:

1. Product Exploration

Choose any product of your interest; Explore the product with your inference and upload the summary of your findings in the form provided, covering the features issues and your proposed ideas.

2. Entrepreneur Framework Design

Imagine you are going to create a product for a Startup, where you need to create a user persona covering the following features

- Demographic Information (Persona name and personal information)
- Goal and Objectives
- Psychographic Information (interest, choices and Personality traits)
- Behavior and Preference

• User Journey

• Challenges and Pain Points

[Upload your response in the Lucid chart, user persona template]

3. Empathy Map Design

Create a user journey map for the AI- Fridge by exploring below link

https://www.theverge.com/2023/12/27/24016939/samsung-2024-ai-family-hub-smart-fridge-features

[Upload your response in the Lucid chart, user journey map]

4. Generation of Inference Report

Problem Statement Reference

1. Use of Robots in Welding in inaccessible areas / Foundry

2. Augmented Reality in Inventory Management for Automobile Industry or Industrial Machine manufacturers

3. Railway Ticketing Management system

Collect one reference article for any one of the given problems

Create Inference report for the article collected

[Upload your response in the Lucid chart, inference report]

5. SDLC Model Design

Imagine you need to develop a product for an airport to track the baggage using RFID tags

Provide the waterfall model for your software product development

[Upload your response in the Lucid chart, Waterfall Model Template]

6. SDLC Model Design

Imagine that you are developing a recommendation system for an online apparel application

Design an agile board for your software development solution

[Upload your response in the Lucid chart, Agile Board]

7. Case Studies and Scenarios for Soft Skills

Name of the Project (Sample)

Image you are a new entrepreneur aspiring to,

Develop a mobile application to enhance customer experience in metro rail transport by facilitating e-ticket booking and speed up boarding processes.

Deliverable 1: Create a business model canvas of design thinking for the above problem

Deliverable 2: Prepare a UI template using a Figma tool

Deliverable 3: Create a customer journey map for the given problem

Text Books:	
1	Thinking Skills - Critical Thinking and Problem Solving" by Geoff Thwaites and John Butterworth
2	Critical Thinking A Student's Introduction" by Gregory Bassham William Irwin, Henry Nardone, James M. Wallace
3	Leadership: Theory and Practice" by Peter G. Northouse
4	Innovation and Entrepreneurship" by Peter F. Drucker
Reference Books:	
1	Critical Thinking: Tools for Taking Charge of Your Learning and Your Life" by Richard Paul and Linda Elder
2	"The 7 Habits of Highly Effective People" by Stephen R. Covey
3	"Design Thinking: Understanding How Designers Think and Work" by Nigel Cross
4	"Where Good Ideas Come From" by Steven Johnson
E-Books/MOOCs/NPTEL	
1	eBook: "The Innovator's Dilemma" by Clayton Christensen Online Resource: Harvard Business Review's Innovation section (https://hbr.org/topic/innovation)

Course Outcomes:

COs	**Description**
CO1	Develop a solution framework with design thinking principles
CO2	Categorize Design thinking in real-world applications along with Waterfall and Agile models
CO3	Relate the Critical thinking and Design thinking framework in problem-solving
CO4	Build the strategies for Teamwork and Leadership
CO5	Utilize communication proficiency in the Professional space

Mapping of CO and PO:

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	1	-	-	-	-	-	-	1
CO2	2	3	-	-	1	-	-	-	-	-	-	1
CO3	2	-	-	-	-	-	-	-	-	1	-	-
CO4	1	-	-	-	-	-	-	-	3	1	-	-
CO5	-	-	-	-	-	-	-	-	-	3	-	-