PARUL UNIVERSITY - Faculty of Engineering and Technology

Department of Computer Science & Engineering

SYLLABUS FOR 2nd Sem BTech PROGRAMME

Design Thinking Theory

Type of Course:. BTech

Prerequisite: Open mindedness, curiosity, empathy, collaboration, iteration, creative thinking

Rationale: Design thinking is a human-centered approach to problem-solving that emphasizes empathy, experimentation, and creativity. It is a framework for innovation and problem-solving that was originally developed in the context of product design but has since been applied to a wide range of fields and industries.

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
				External		Internal			
Lect Hrs/ Week	Tut Hrs / Week	Lab Hrs/ Week		T	P	T	CE	P	
4	0	0	2	60	0	20	20	-	100

Lect - Lecture, **Tut** - Tutorial, **Lab** - Lab, **T** - Theory, **P** - Practical, **CE** - CE, **T** - Theory, **P** - Practical

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	**Overview of Design Thinking**: Define Design Thinking, Differentiate Design Thinking from Design, Get an Overview of the Design Thinking Process, **Empathize and Understand**: Explain how empathy influences the outcomes of Design Thinking, List Different Empathy Research Techniques, Define the Guidelines for an Empathetic Research,	20%	5

2	**Defining Needs**: Explain how PoV can be used in defining the design problem, Use a structured approach to arrive at a PoV, **Ideation for Solutions**: List the best practices for conducting a successful ideating session, Describe the techniques for evaluating and prioritizing ideas, **Prototyping**: Define prototyping, Explain how prototyping aids in communicating ideas effectively, List various tools for prototyping,	20%	5
3	**Testing the Solution**: Define the steps of a successful testing approach, Demonstrate the process of gathering and responding to user feedback. **Problem Solving Mindset:** Understanding Problem Statements, Recapping Design Principles, Design Thinking Toolsets, Formulating approaches to Solutions, Applications of Design Thinking: Case Study.	20%	10
4	**Human Centered Design :** Services Development process and lifecycle, Product Vs Services, Innovation in Services, Service Experience Lifecycle, Human Computer Interaction, Usability Engineering - Heuristic Evaluation. **Design for the Environment :** Design Considerations, Environmental Issues, Sustainable Development, Green Design – Design for Process, Design for Product, Qualitative and Quantitative Methods for DFE, Design for Disassembly, Design for Recyclability, Design for Energy Efficiency. The relevance of 4Rs - reduction, reuse, recycling and recovery in Environmental friendly design. Sustainable Development.	20%	10
5	**Design Thinking and Innovation Management Culture:** Project Management - Project Planning, Business Plan, Planning the resources, Effective Communication, Team Management, Benchmarking the Development, Cost Estimation, Interpreting the Feedback and Troubleshooting, Pitching the idea, Revenue Model.	20%	10

Continuous Evaluation:

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

Reference Books:

1. The Design Thinking Playbook: Mindful Digital Transformation of Teams, Products, Services, Businesses and Ecosystems

2. The Design Thinking Playbook: Mindful Digital Transformation of Teams, Products, Services, Businesses and Ecosystems

Course Outcome:

After learning the course, the students should be able to:

1.

Understand the basics of design thinking and its implications in product or service development
Understand and Analyze the requirements of a typical problem
Plan the necessary activities towards solving the problem through ideation and prototyping
Evaluate the solution and refine them based on the customer feedback

Understand the problem statement, requirements and formulating approaches to solve real world problems.
Designing the solution by taking the user interactions & ease of use into consideration
Apply the design principles in building sustainable and environment friendly solutions.
Manage the Innovation effectively interms of resources, finances, copyright, IPR, Trademark, Patent and license agreement policies for protecting own R&D innovations and enhancing brand image.