INT335:DESIGN THINKING

L:2 T:0 P:0 Credits:2

Course Outcomes: Through this course students should be able to

CO1 :: explain the core principles of human-centered design frameworks and differentiate iterative workflows from traditional linear engineering pipelines.

CO2 :: apply primary qualitative research and field observation methods to identify user requirements and customer environmental needs.

CO3 :: analyze unstructured user data and qualitative insights to formulate clear, actionable design challenge frameworks.

CO4 :: apply divergent thinking tools, ideation strategies, and screening techniques to systematically prioritize alternative design solutions.

CO5 :: demonstrate prototyping concepts by planning low-fidelity layouts and structural interaction paths for applications.

CO6 :: analyze user validation data, feedback matrices, and customer journey graphs to identify operational design bottlenecks.

Unit I

Foundations of Learning, Creativity and Design Thinking : Learning and Creative Thinking: Brain Processing Dynamics: Focused and Diffuse Modes, Learning Frameworks and VARK Model, Functional Fixedness and Cognitive Blocks, Creativity, Invention and Innovation, Foundations of Design Thinking: History and Evolution of Design Thinking, Stanford d.school Design Thinking Framework, IDEO Human-Centred Design Framework, Global Case Studies of Successful and Failed Designs

Unit II

Empathy, Observation and Problem Identification : User Empathy and Research Methods: Computational Empathy in Software Engineering, Qualitative and Quantitative User Research, Field Observation and AEIOU Framework, User Interviews and Inquiry Techniques, User Needs and Problem Identification: Explicit and Implicit User Needs, User Pain Points and Problem Identification, User Personas and Target Archetypes, Empathy Mapping and User Insights

Unit III

Ideation and Creative Problem Solving : Divergent Thinking and Idea Generation: Convergent and Divergent Thinking, Brainstorming and Idea Generation, SCAMPER Technique, Mind Mapping and Reverse Thinking, Idea Evaluation and Selection: Idea Organisation and Clustering, Feasibility and Relevance Analysis, Idea Screening Matrices, Idea Selection and Prioritisation

Unit IV

Product Design and Prototyping : Prototyping and Rapid Learning: Prototyping Philosophy and Rapid Learning, Low-Fidelity and High-Fidelity Prototypes, Paper Prototyping for Digital Products, Storyboarding User Interactions, Wireframing and Minimum Viable Product: Fundamentals of Digital Wireframing, Wireframing Rules and Conventions, User Flows and Core Product Features, Minimum Viable Product (MVP)

Unit V

Testing, Validation and Customer Experience : User Testing and Design Validation: Principles of Neutral User Testing, Task Scenarios and User Testing, Show, Don't Tell Testing Approach, Feedback Capture Matrix, Customer Experience and Usability: Customer Experience and Journey Mapping, User Touchpoints and Pain Points, Software Usability and Navigation, Accessibility in Digital Products

Unit VI

Innovation Project, Re-Design and Product Presentation : Design Iteration and Product Re-Design: Principles of Design Iteration, User Feedback Analysis, Design Refactoring and Re-Design, Strategic Pivoting and Continuous Improvement, Product Presentation and Design Communication: High-Impact Product Presentation, NABC Model, Elevator Pitching and Product Communication, Technical Design Case Study and Final Project Presentation

Text Books:

1. CHANGE BY DESIGN by TIM BROWN, HARPER

References:

1. DESIGN THINKING FOR DUMMIES by CHRISTIAN MULLER-ROTERBERG, WILEY