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SavitribaiPhule Pune University **Third Year of Artificial Intelligence and Data Science (2019 Course)** **Elective I** **314445 (C): Design Thinking**		
Teaching Scheme:	**Credit**	**Examination Scheme:**
TH: 03 Hours/Week	03	Mid_Semester(TH): 30 Marks End_Semester(TH): 70 Marks

Prerequisite Courses, if any: Programming and Problem Solving, Software Engineering

Companion Course, if any:Elective I Laboratory (317525)

Course Objectives:
- To learn the Design thinking basic concepts.
- To identify the opportunities and challenges for design thinking innovation.
- To describe, define and ideate process of design thinking.
- To summarize the prototyping techniques.
- To enlist the activities carried out in Test and reflect phase of design thinking.
- To Interpret Design Thinking case studies.

Course Outcomes:
On completion of the course, learner will be able to–
CO1: Identify need and features of design thinking.
CO2: Identify the opportunities and challenges for design thinking innovation.
CO3: Learn the process of design thinking using various tools.
CO4: Summarize and learn the various prototyping techniques.
CO5: Enlist the activities carried out in Test and reflect phase of design thinking.
CO6: Interpret the design thinking disruptive innovations through case studies.

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Course Contents

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Unit I	**INTRODUCTION TO DESIGN THINKING**	**(06 Hours)**

Introduction to Design and Design Thinking, Definition of Design Thinking, Need of Design Thinking, Features of Design Thinking, Problem Solving and Design, Design thinking as Strategy of Innovation, Use of Design Thinking, Design Thinking-Attributes, The Principles of Design Thinking, The Five-step Process of Design Thinking(Empathize, Define, Ideate, Prototype, Test),Design **Thinking-A Solution basedthinking:** Design Thinking vs. Scientific Method, Problem Focused vs. Solution Focused, Analysis vs.Synthesis, Divergent Thinking vs. Convergent Thinking , Roots of Design Thinking in Human Centric Design Process.

#Exemplar/Case Studies	Understanding the Design Thinking Mindsets
Mapping of Course Outcomes for Unit I	**CO1**

Unit II	**EXPLORE AND EMPATHIZE**	**(06 Hours)**

Explore- STEEP Analysis, Activity Systems, Stakeholder Analysis, Framed Opportunities
Empathise- Observation, Problem statement, User Interviews- Interview for Empathy, Explorative Interview, Ask 5x Why, 5W+H questions (Design Thinking Toolbox), Needs Finding, Empathy Map,
Persona Development, Customer Journey Map

#Exemplar/Case Studies	Details of Creative Thinking Strategies
Mapping of Course Outcomes for Unit II	CO2

Unit III	**DEFINE AND IDEATE**	**(06 Hours)**

Define- Define Point of view, "How might we ..." question, Storytelling, Context MappingIdeate- Brainstorming, 2x2 Matrix
Ideate- Purpose, Methods & Tools, SCAMPER, SCAMPER for Ideation, SCAMPER template, AnalogousInspiration, IDEATION using Deconstruct & Reconstruct, User Experience Journey

#Exemplar/Case Studies	

Mapping of Course Outcomes for Unit III	CO3

Unit IV	PROTOTYPE	(06 Hours)

Get Visual, Design Principals, Determine What to Prototype, Storyboard
Prototype- How to carry out Prototyping? Frequently used kinds of prototypes, Focused experiments
– Critical Experience Prototype (CEP) & Critical Function Prototype (CFP), Crazy experiments – Darkhorse Prototype, Combined experiments – Funky prototype
Prototyping -Paper Prototyping, Digital Prototyping- Wireframe vs Realistic Prototypes, HTML vs WYSIWYG Editors, Additional Tools for Prototyping, Working with a Developer, Prototype Examples

#Exemplar/Case Studies	Understanding Design Thinking & People Centered Design
Mapping of Course Outcomes for Unit IV	CO4

Unit V	TEST AND REFLECT	(06 Hours)

Test- Testing Sheet, Feedback Capture Grid, Powerful questions in experience testing, Solution interview Structured Usability Testing, A/B Testing, Design Testing with Users, Exploring Visual Design Mock-Ups Choosing a Design Testing, Usability Testing, Reflect- I like, I wish, I wonder, Create a pitch, lean canvas lessons learned, Road map for implementation Evolve- Concept Synthesis, Viability Analysis(Impact Evaluation), Innovation Tool using user needs, CAP, 4s.

#Exemplar/Case Studies	Study UberEATS
Mapping of Course Outcomes for Unit V	CO5

Unit VI	DISRUPTIVE INNOVATION	(06 Hours)

Reimagining the Trade Show Experience at IBM, Redesigning the Customer Contact Center at Toyota, Social Networking at MeYou Health, Rethinking Subsidized Meals for the Elderly at The Good Kitchen THE SOCIAL PROBLEM
Design Thinking in Healthcare with IDEO, Design Thinking Transformed Airbnb, IBM Design Thinking:
A Framework To Help Teams Continuously Understand and Deliver, UberEATS.

#Exemplar/Case Studies	Design Thinking - Health Care Industry
Mapping of Course Outcomes for Unit VI	CO6

Learning Resources

Text Books:
1. Michael Lewrick, Patrick Link, Larry Leifer , "The Design Thinking Toolbox: A Guide to Mastering the Most Popular and Valuable Innovation Methods", March 2020 edition, ISBN: 978-1-119- 62921-4, WILEY Publication.
2. Mr Lee Chong Hwa (Lead Facilitator), "The Design Thinking: Guidebook"

Reference Books:
1. Russ Unger, Carolyn Chandler, "A Project Guide to UX Design For user experience designers in the field or in the making (Voices That Matter)", 2nd Edition, ISBN 13: 978-0-321-81538-5
2. Karl T Ulrich, "Design – Creation of Artifacts in Society", 1st edition, ISBN 978-0-9836487-0-3,
University of Pennsylvania
3. Tim Brown, "Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation", ISBN- 9780061937743, Harper Collins, 2009.
4. Eli Woolery, "Design Thinking Handbook", In-Vision publisher.
5. Jeanne Liedtka, Andrew King, Kevin Bennett, "Solving Problems with Design Thinking: TenStories
Of "What Works", Columbia Business School Publishing, E-ISBN 978-0-231-53605-9

e-Books:
1. Design Thinking - A Primer online course video lectures by IIT Madras (freevideolectures.com)

2. NPTEL: Humanities and Social Sciences - NOC: Understanding Design Thinking & People Centered
   Design
3. NPTEL: Management - NOC: Design Thinking - A Primer
4. Design Thinking Transformed Airbnb: https://review.firstround.com/How-design-
   thinkingtransformed-Airbnb-from-failing-startup-to-billion-dollar-business
5. UberEATS: https://medium.com/uber-design/how-we-design-on-the-ubereats-teamff7c41fffb76
6. IBM Design Thinking: A Framework To Help Teams Continuously Understand and Deliver:
https://www.ibm.com/blogs/think/2016/01/ibm-design-thinking-a-framework-for-teams-
tocontinuously-understand-and-deliver/

MOOC Courses:

@The CO-PO mapping table

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1		2		2	1					1	2
CO2	1		2		2	1					1	2
CO3	1		2		2	1					1	2
CO4	1		2		2	1					1	2
CO5	1		2		2	1					1	2
CO6	1		2		2	1					1	2