**DHANALAKSHMI SRINIVASAN ENGINEERING COLLEGE**
(AUTONOMOUS)
(Approved by AICTE & Affiliated to Anna University, Chennai)
Re-Accredited with 'A' Grade by NAAC, Accredited by TCS
Accredited by NBA – BME, ECE & EEE
**PERAMBALUR - 621 212. Tamil Nadu.**
website : www.dsengg.ac.in

## COURSE PLAN

| | | | | |
|---|---|---|---|---|
| **Course Code/Name** | U23AIT35/ DESIGN THINKING FOR AI | | | |
| **Year/Section/Department** | II/B/AI&DS | | | |
| **Credits Details** | **L:3** | **T:0** | **P:0** | **C:3** |
| **Total Contact Hours Required** | 45 | | | |

**Syllabus:**

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|---|---|
| **UNIT I - PRINCIPLES OF DESIGN THINKING** | **No. of Periods: 9** |
| Principles of Design Thinking- Process of Design Thinking – Planning a Design Thinking project- Understanding of the problem - Observation Phase - Point-of-View Phase - Ideate Phase - Prototype Phase - Test Phase – Implementation | |
| **UNIT II - EXPLORE, EMPATHIZE AND EXPERIMENT PHASES** | **No. of Periods 9** |
| Explore phase-STEEP Analysis, Strategic priorities, Activity System, Stakeholder Mapping, Opportunity Framing-Empathize - Methods & Tools, Field observation, Deep user interview, Needs Finding, Persona Development Experiment-Methods & Tools, Ideation using Scamper, Analogous Inspiration, Deconstruct & Reconstruct, User Experience Design, Prototyping | |
| **UNIT III - ENGAGE AND EVOLVE PHASE** | **No. of Periods 9** |
| Engage-Methods & Tools, Storytelling, Storyboarding, co-creation -Evolve- Methods & Tools, Concept Synthesis, Strategic requirements, Activity system integration, viability analysis, Innovation Tool (Using User needs, CAP,4S), Change management tool using review, Quick wins, Art of Story telling | |
| **UNIT IV – VISUALIZATION** | **No. of Periods 9** |
| Visualization-Journey Mapping-Value chain analysis-Mind Mapping-Brainstorming , Concept Development- Assumption Testing-Rapid prototyping-customer co-creation-Learning Launch-Leading growth and innovation in an organization | |
| **UNIT V - ADOPTION OF ARTIFICIAL INTELLIGENCE** | **No. of Periods 9** |
| Introduction to the adoption of Artificial Intelligence-Design and its operating context-AI empowered design in practice-Design for Artificial Intelligence-Implications for Innovation and Design Theories. | |

**Objective:**

To understand the process of Design Thinking
To explore the analysis and experiment various methods and tools
To understand the concept synthesis and strategic requirements
To visualize the process of Journey mapping
To adopt Artificial Intelligence in the process of Design Thinking

**Text Book:**

T1: Müller-Roterberg, Christian. (2018). "Handbook of Design Thinking". T2 : Design Thinking the Guide Book

**Reference Book:**

T1: Tim Brown, Barry Katz," Change by Design - How Design Thinking Transforms Organizations and Inspires Innovation", First Edition, HapperCollins,2009

T2: Thomas Lockwood, "Design Thinking – Integrating, Innovation, Customer experience and Brand value", First Edition, Allworth Press, 2009

T3: Jeanne Liedtka and Tim Ogilvie.(2011), "Designing for Growth: a design thinking tool kit for managers".

**Online Mode of Study:**

**NPTEL details can be listed.**

https://onlinecourses.nptel.ac.in/noc22_mg32/preview
https://nptel.ac.in/courses/110106124
https://onlinecourses.nptel.ac.in/noc25_mg106/preview

**Course Plan:**

| Topic Number | Topic | Reference Detail | Page Number | Mode of teaching | Number of Periods Required | Cumulative Period |
|---|---|---|---|---|---|---|
| **UNIT I – PRINCIPLES OF DESIGN THINKING** | | | | | | **9** |
| 1 | Principles of Design Thinking | T1 | 3-7 | BB | 1 | 1 |
| 2 | Process of Design Thinking | T1 | 9-16 | BB | 1 | 2 |
| 3 | Planning a Design Thinking project | T1 | 18-23 | BB | 1 | 3 |
| 4 | Understanding of the problem | T1 | 41-50 | PPT | 1 | 4 |
| 5 | Observation Phase | T1 | 84-90 | BB | 1 | 5 |
| 6 | Point-of-View Phase | T1 | 52-59 | BB | 1 | 6 |
| 7 | Ideate Phase | T1 | 59-70 | PPT | 1 | 7 |
| 8 | Prototype Phase | T1 | 71-80 | BB | 1 | 8 |
| 9 | Test Phase Implementation | T1 | 81-90 | BB | 1 | 9 |
| **Outcome of Unit I:** **CO1**: Plan a Design Thinking project | | | | | | |
| **UNIT II - EXPLORE, EMPATHIZE AND EXPERIMENT PHASES** | | | | | | **9** |
| 10 | Explore phase-STEEP Analysis | T2 | 16-21 | BB | 1 | 10 |
| 11 | Strategic priorities, Activity System | T2 | 22-25 | BB | 1 | 11 |
| 12 | Stakeholder Mapping, Opportunity Framing | T2 | 26-28 | PPT | 1 | 12 |
| 13 | Empathize - Methods & Tools, Field observation | T2 | 31-35 | BB | 1 | 13 |
| 14 | Deep user interview, Needs Finding | T2 | 36-44 | BB | 1 | 14 |
| 15 | Persona Development Experiment –Method & Tools | T2 | 45-50 | BB | 1 | 15 |
| 16 | Ideation using SCAMPER | T2 | 51-55 | BB | 1 | 16 |
| 17 | Analogous Inspiration, Deconstruct & Reconstruct | T2 | 56-58 | PPT | 1 | 17 |

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| 18 | User experience, Prototyping | T2 | 59-61 | BB | 1 | 18 |

**Outcome of Unit II:**

**CO2:** Empathize and experiment the methods and tool.

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| | **UNIT III - ENGAGE AND EVOLVE PHASE** | | | | | **9** |
| 19 | Engage Methods & Tools | T2 | 60-63 | BB | 1 | 19 |
| 20 | Storytelling, Storyboarding | T2 | 64-66 | BB | 1 | 20 |
| 21 | co-creation -Evolve-Methods & Tools | T2 | 67-85 | PPT | 1 | 21 |
| 22 | Concept Synthesis, Strategic Requirements | T2 | 86-73 | BB | 1 | 22 |
| 23 | Activity System Integration | T2 | 74-76 | BB | 1 | 23 |
| 24 | Viability Analysis | T2 | 77-80 | BB | 1 | 24 |
| 25 | Innovation Tool (User Needs, CAP, 4S) | T2 | 81-83 | PPT | 1 | 25 |
| 26 | Change Management Tool using Review | T2 | 84-86 | BB | 1 | 26 |
| 27 | Quick Wins , Art of Story telling | T2 | 86-90 | BB | 1 | 27 |

**Outcome of Unit III:**

**CO3:** Understand the strategic requirements.

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| | **UNIT IV - VISUALIZATION** | | | | | **9** |
| 28 | Visualization – Journey Mapping | T1,R1 | 345-358 | PPT | 1 | 28 |
| 29 | Value Chain Analysis, Mind Mapping | T3,R1 | 358-360 | BB | 2 | 30 |
| 30 | Brainstorming, Concept Development | T3,R1 | 362-367 | BB | 2 | 32 |
| 31 | Assumption Testing, Rapid Prototyping | T3,R1 | 368-374 | PPT | 2 | 34 |
| 32 | Customer Co-creation | T1 | 372-378 | BB | 1 | 35 |
| 33 | Learning Launch and Innovation | T1 | 378-380 | BB | 1 | 36 |

**Outcome of Unit IV:**

**CO4:** Appreciate the concept development

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| **UNIT V – ADOPTION OF ARTIFICIAL INTELLIGENCE** | | | | | | **9** |
| 34 | Introduction to AI Adoption | T2,R2 | 519-523 | BB | 1 | 37 |
| 35 | Design and Its Operating Context | T2,R2 | 288-289 | BB | 2 | 39 |
| 36 | AI-Empowered Design in Practice | T1,R3 | 305-310 | BB | 1 | 40 |
| 37 | Design for Artificial Intelligence | T1,R3 | 289-304 | BB | 2 | 42 |
| 38 | Implications for Innovation | T1,R3 | 237- 239 | BB | 1 | 43 |
| 39 | Implications for Design Theories | T1 | 401-440 | BB | 1 | 44 |
| 40 | AI Tools in Design Thinking | T1 | 440-444 | BB | 1 | 45 |

**Outcome of Unit V:**

**CO5:** Appreciate the adoption of Artificial Intelligence

**CO6:** Create the Innovations in Design Theories

**Course Outcome:**

At the end of course the students should be able to do:

**CO1:** Plan a Design Thinking project

**CO2:** Empathize and experiment the methods and tools

**CO3:** Understand the strategic requirements

**CO4:** Appreciate the concept development

**CO5:** Appreciate the adoption of Artificial Intelligence

**CO6:** Create the Innovations in Design Theories

**Course Outcome Vs Program Outcome Mapping:**

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 3 | 1 | - | - | - | - | - | - | - | - | - | - |
| CO 2 | 3 | 1 | - | - | - | - | - | - | - | - | - | - |
| CO 3 | 3 | 1 | - | - | - | - | - | - | - | - | - | - |
| CO 4 | 3 | 1 | - | - | - | - | - | - | - | - | - | - |
| CO 5 | 2 | 2 | 1 | 1 | - | - | - | - | - | - | - | - |
| CO 6 | 2 | 2 | 1 | 1 | - | - | - | - | - | - | - | - |
| AVG | 2.33 | 1.33 | 1.00 | 1.00 | - | - | - | - | - | - | - | - |

**Content beyond Syllabus**:

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|---|
| Generative AI tools for ideation and prototyping<br>Prompt engineering to guide AI behavior in design tasks<br>Human-centered AI design and responsible innovation<br>Integration of AI tools into Agile design workflows |

**Internal Evaluation Components:**

| Web portal | Assignment | Components | Topic Number with Topic / Unit Details | Relevance to CO |
|---|---|---|---|---|
| Web portal 1 | -- | **Assessment – I (60)** | **Unit I and II** | **CO 1 & CO2** |
| | **1** | **Assignment – Handwritten (20)** | 2. Introduction to DT phases<br>3. Planning a design thinking project<br>5. Observation phase<br>6. Point of view statement | **CO 1 & CO2** |
| | **2** | **Assignment – Group PPT (20)** | 12. Opportunity Framing<br>15. Persona Creation<br>16. Ideation using SCAMPER methods<br>17. Analogous Inspiration | **CO 1 & CO2** |
| Web portal 2 | -- | **Assessment – II (60)** | Unit III and IV | **CO3 & CO4** |
| | **3** | **Seminar (20)** | 21. Co-Creation<br>22. Concept Synthesis and Strategic requirements<br>24. CAP,4S Innovation Tools | **CO3 & CO4** |
| | **4** | **Tool Creation Activity (20)** | 20. Storyboard Template<br>28. Journey Mapping<br>29. Value chain analysis Table | **CO3 & CO4** |
| Web portal 3 | -- | **Model Exam (75)** | **Unit I to V** | **CO1 to CO6** |
| | **5** | **Mini Project/Poster (15)** | Design thinking Application in Everyday Life | **CO1 to CO6** |
| | **-** | **Course Attendance (10)** | **--** | **--** |

**Submission Details:**

| Phase 1(Before AT 1) | | Phase 2 (Before AT 2) | | Phase 3 (Model) |
|---|---|---|---|---|
| **Assignment 1** | **Assignment 2** | **Assignment 3** | **Assignment 4** | **Assignment 5** |
| | | | | |

**Google Class Code Details:**

Class Name:

**PLAN OF ASSESSMENT TEST –DISTRIBUTION OF MARKS:**

| **TEST** | **CO- MARK WISE DISTRIBUTION** | | | | | | **BLOOM'S LEVEL MARK WISE DISTRIBUTION** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AT-1** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** | **CO6** | **BTL1** | **BTL2** | **BTL3** | **BTL4** | **BTL5** | **BTL6** |
| | | | | | | | | | | | | |
| **AT-2** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** | **CO6** | **BTL1** | **BTL2** | **BTL3** | **BTL4** | **BTL5** | **BTL6** |
| | | | | | | | | | | | | |
| **MODEL** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** | **CO6** | **BTL1** | **BTL2** | **BTL3** | **BTL4** | **BTL5** | **BTL6** |
| | | | | | | | | | | | | |

**Prepared By** **Verified By**

**Approved By**
**PRINCIPAL**