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|------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>Branch Name:</b>          | Computer Engineering / Information Technology/ Information and Communication Technology / Artificial Intelligence and Data Science |
| <b>Program Code:</b>         | ET103/ ET105/ ET107/ ET108                                                                                                         |
| <b>Course Title:</b>         | Design Thinking                                                                                                                    |
| <b>Course Code:</b>          | 2ET1000302P                                                                                                                        |
| <b>Pre-requisite Course:</b> | --                                                                                                                                 |

#### Course Objectives:

- To present an overview of the design thinking involved at each stage of the design process
- To explain the methods used by designers to generate and refine creative ideas, the key considerations that help shape them and the feedback and review elements that allow design teams to learn from each job and contribute to future commissions.

#### Teaching and Examination Scheme:

| Credit | Teaching Scheme<br>Hours per week |   |   |       | Evaluation Scheme (Marks) |      |      |      |                   |      |      |      | Total<br>(Marks) |
|--------|-----------------------------------|---|---|-------|---------------------------|------|------|------|-------------------|------|------|------|------------------|
|        |                                   |   |   |       | Theory (Marks)            |      |      |      | Practical (Marks) |      |      |      |                  |
|        | L                                 | T | P | Total | SEE                       |      | CCA  |      | SEE               |      | CCA  |      |                  |
|        |                                   |   |   |       | Min.                      | Max. | Min. | Max. | Min.              | Max. | Min. | Max. |                  |
| 1      | -                                 | - | 2 | 2     | -                         | -    | -    | -    | 10                | 25   | 10   | 25   | 50               |

#### List of Practical's:

##### Understanding Design thinking

- Shared model in team-based design – Theory and practice in Design thinking – Explore presentation : Introduction about the design thinking: Chalk and Talk method
- Theory and practice through presentation
- signers across globe – MVP or Prototyping : MVP and Prototyping through live examples and videos

##### Tools for Design Thinking

- Real-Time design interaction capture and analysis – Enabling efficient collaboration in digital space -Empathy for design – Collaboration in distributed Design : Process Simulation exercises for collaborated enabled design thinking
- Case studies on design thinking for real-time interaction and analysis: Live examples on the success of collaborated design thinking

##### Design Thinking for strategic innovations

- Growth – Story telling representation – Strategic Foresight - Change – Sense Making - Maintenance
- Relevance – Value redefinition - Extreme Competition – experience design - Standardization –
- Humanization - Creative Culture – Rapid prototyping, Strategy and Organization – Business Model design.
- Business model examples of successful designs

##### Design thinking workshop

- Design Thinking Work shop Empathize, Design, Ideate, Prototype and Test
- Design thinking workshop from the expect and then presentation by the students on the learning from the workshop

#### Reference Books:

- John.R.Karsnitz, Stephen O'Brien and John P. Hutchinson, "Engineering Design", Cengage, learning (International edition) Second Edition, 2013.
- Roger Martin, "The Design of Business: Why Design Thinking is the Next Competitive Advantage", Harvard Business Press, 2009.

- Hasso Plattner, Christoph Meinel and Larry Leifer (eds), "Design Thinking: Understand – Improve, Apply", Springer, 2011
- Idris Mootee, "Design Thinking for Strategic Innovation: What They Can't Teach You at Business, or Design School", John Wiley & Sons 2013.
- Yousef Haik and Tamer M. Shahin, "Engineering Design Process", Cengage Learning, Second, Edition, 2011.
- Solving Problems with Design Thinking - Ten Stories of What Works (Columbia Business School Publishing) Hardcover – 20 Sep 2013 by Jeanne Liedtka (Author), Andrew King (Author), Kevin Bennett (Author).

**Web links and Video Lectures (e-Resources):**

- [www.tutor2u.net/business/presentations/. /productlifecycle/default.html](http://www.tutor2u.net/business/presentations/. /productlifecycle/default.html)
- [https://docs.oracle.com/cd/E11108\\_02/otn/pdf/. /E11087\\_01.pdf](https://docs.oracle.com/cd/E11108_02/otn/pdf/. /E11087_01.pdf)
- [www.bizfilings.com](http://www.bizfilings.com) › Home › Marketing › Product Developmen
- <https://www.mindtools.com/brainstm.html>
- <https://www.quicksprout.com/. /how-to-reverse-engineer-your-competit>
- [www.vertabelo.com/blog/documentation/reverse-engineering](http://www.vertabelo.com/blog/documentation/reverse-engineering)
- <https://dschool.stanford.edu/.../designresources/.../ModeGuideBOOTCAMP2010L.pdf>
- <https://dschool.stanford.edu/use-our-methods/> 6. <https://www.interactiondesign.org/literature/article/5-stages-in-the-design-thinking-process> 7.
- <http://www.creativityatwork.com/design-thinking-strategy-for-innovation/> 49 8.
- <https://www.nngroup.com/articles/design-thinking/> 9.
- <https://designthinkingforeducators.com/design-thinking/> 10.
- [www.designthinkingformobility.org/wp-content/.../10/NapkinPitch\\_Worksheet.pdf](http://www.designthinkingformobility.org/wp-content/.../10/NapkinPitch_Worksheet.pdf)
- <http://dschool.stanford.edu/dgift/>
- [https://onlinecourses.nptel.ac.in/noc19\\_mg60/preview](https://onlinecourses.nptel.ac.in/noc19_mg60/preview)

**Course Learning Outcomes:**

- Understand contemporary work and basic theories
- Analyse ideas to produce creative solutions
- Create effective solutions for given problems

**Course Learning Outcomes (CLO): On completion of this course, the students will be able to:**

| CLO  | Description                                     | Bloom's Taxonomy Level |
|------|-------------------------------------------------|------------------------|
| CLO1 | Understand contemporary work and basic theories | Understanding (L2)     |
| CLO2 | Analyses ideas to produce creative solutions    | Analysis (L4)          |
| CLO3 | Create effective solutions for given problems   | Create (L6)            |

L1- Remember, L2- Understand, L3- Apply, L4- Analyze, L5- Evaluate, L6- Create

**Mapping of CLOs with POs & PSOs**

| Course Learning Outcomes | Program Outcomes (POs) |     |     |     |     |     |     |     |     |      |      |      | Program Specific Outcomes (PSOs) |      |      |
|--------------------------|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|----------------------------------|------|------|
|                          | PO1                    | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1                             | PSO2 | PSO3 |
| CLO1                     | M                      | M   | M   | M   |     |     |     |     |     |      |      | M    | M                                | M    | M    |
| CLO2                     | M                      | M   | M   | M   |     |     |     |     |     |      |      | M    | M                                | M    | M    |
| CLO3                     | M                      | M   | M   | M   |     |     |     |     |     |      |      | M    | M                                | M    | M    |

H: High, M: Medium, L: Low