



# GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Computer Applications /  
Bachelor of Computer Applications(Honours /Honours with Research) /  
Master of Computer Applications (Integrated)

Level: UG

Course / Subject Code: BC03001071

Course / Subject Name : Design Thinking and Innovation

|                         |                     |
|-------------------------|---------------------|
| w. e. f. Academic Year: | 2025-26             |
| Semester:               | 3                   |
| Category of the Course: | Value Added Courses |

|                      |                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Prerequisite:</b> | Basic understanding of problem-solving and creativity in software development.                                                                                                                                                                                                                                                                                                                    |
| <b>Rationale:</b>    | This course introduces the principles and practices of Design Thinking as a human-centered, iterative approach to innovation. It empowers students to develop empathy with users, reframe problems, ideate innovative solutions, and create prototypes for testing. The course prepares future technologists to solve complex and ill-defined problems with creativity, empathy, and feasibility. |

## Course Outcome:

After Completion of the Course, Student will able to:

| No | Course Outcomes                                                   | RBT Level |
|----|-------------------------------------------------------------------|-----------|
| 01 | Explain the foundational principles of Design Thinking            | UN        |
| 02 | Understand the significance of empathy and user research          | UN        |
| 03 | Identify and define problems for innovative solution development. | AP        |
| 04 | Apply methods for idea generation and creativity                  | AP        |
| 05 | Discuss the role of prototyping and iterative design.             | UN        |

*\*Revised Bloom's Taxonomy (RBT)*

## Teaching and Examination Scheme:

| Teaching Scheme<br>(in Hours) |   |    | Total Credits<br>L+T+ (PR/2) | Assessment Pattern and Marks |             |                      |         | Total<br>Marks |
|-------------------------------|---|----|------------------------------|------------------------------|-------------|----------------------|---------|----------------|
| L                             | T | PR | C                            | Theory                       |             | Tutorial / Practical |         |                |
|                               |   |    |                              | ESE (E)                      | PA / CA (M) | PA/CA (I)            | ESE (V) |                |
| 2                             | 0 | 0  | 2                            | 70                           | 30          | 0                    | 0       | 100            |

## Course Content:

| Unit No. | Content                                                                                                                                  | No. of Hours | % of Weightage |
|----------|------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------|
| 1        | <b>Introduction to Design Thinking:</b> Origins, Attributes of design thinking, Principles of design thinking, Models of design thinking | 5            | 20             |
| 2        | <b>Empathy and User Research:</b> Know your user, Interviews, Observation, Persona creation, Role playing                                | 6            | 20             |
| 3        | <b>Defining Problems:</b> Know your problem, Insights, Point-of-view, HMW questions                                                      | 5            | 15             |



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|              |                                                                                                                       |           |            |
|--------------|-----------------------------------------------------------------------------------------------------------------------|-----------|------------|
| 4            | <b>Ideation Techniques:</b> Know your solutions, Brainstorming, Mind mapping, Lateral thinking, The six thinking hats | 7         | 20         |
| 5            | <b>Prototyping and Testing:</b> Know your failures and product, Concept sketching, User feedback, Case study          | 7         | 25         |
| <b>Total</b> |                                                                                                                       | <b>30</b> | <b>100</b> |

## Suggested Specification Table with Marks (Theory):

| Distribution of Theory Marks (in %) |         |         |         |         |         |
|-------------------------------------|---------|---------|---------|---------|---------|
| R Level                             | U Level | A Level | N Level | E Level | C Level |
| 10                                  | 50      | 40      | -       | -       | -       |

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

## References/Suggested Learning Resources:

### (a) Books:

1. E Balagurusamy, Bindu Vijaykumar- Design Thinking: A Beginners Perspective
2. Jeanne Liedtka, Tim Ogilvie – Designing for Growth: A Design Thinking Toolkit for Managers
3. Hasso Plattner, Christoph Meinel, Larry Leifer – Design Thinking: Understand – Improve – Apply
4. Tom Kelley, David Kelley – Creative Confidence
5. Tim Brown – Change by Design
6. Rolf Faste – Ambidextrous Thinking: A Guide to Design Thinking

## Suggested Activities for Students, if any:

- Empathy mapping using interviews, observation, persona creation, and role playing
- Idea generation using different Ideation techniques

## CO- PO Mapping:

| Semester 3      | Course Name : Design Thinking and Innovation |     |     |     |     |     |     |     |     |      |      |
|-----------------|----------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
|                 | POs                                          |     |     |     |     |     |     |     |     |      |      |
| Course Outcomes | PO1                                          | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
| CO1             | 3                                            | 1   | -   | -   | -   | -   | -   | -   | -   | -    | -    |
| CO2             | 2                                            | 3   | 1   |     | 2   | -   | -   | -   | -   | -    | 2    |
| CO3             | 1                                            | 3   | 1   | 2   | 2   | -   | -   | -   | -   | -    | 2    |
| CO4             | 1                                            | -   | 3   | 1   | 2   | -   | -   | -   | -   | -    | 2    |
| CO5             | 1                                            | 1   | 3   | 2   | 1   | -   | -   | 1   | -   | -    | 2    |

Legend: '3' for high, '2' for medium, '1' for low and '-' for no correlation of each CO with PO.

**Note: The CO-PO mapping is indicative; the institute/faculty member can change as required.**

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