



# GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Artificial Intelligence and Data Science

Subject Code: ME02095091

Course/Subject Name: Design of Human Computer Interaction Systems

WEF Academic Year	2024-25
Semester	2
Category of the Course	Professional Elective Course

<b>Prerequisite</b>	Basics of computer and computing system
<b>Rationale</b>	This course covers the subjects such as usability, user experience, user interface, and it requires interdisciplinary approaches to leverage existing and emerging technological interfaces. The learners will be able to carry on the research in the field of product design, instructional systems design, robotics, and gamification. General disciplines layered into HCI consist of psychology, behavioral interactions, ergonomics, engineering, forms of communication, and design.

## Course Outcome:

After completion of the Course, Students will be able to:

No	Course Outcomes	RBT Level*
01	Understand the concepts of usability, user experience and user-centered design.	UN
02	Apply usability goals and user experience goals for designing an interactive product.	AP
03	Analyze the interfacing problems to recognize the suitable design approach and interaction styles.	AP
04	Analyze the user requirements for interaction system.	AN
05	Design and develop an interface by using appropriate HCI techniques that are preferred by the user.	CR

\*RM: Remember, UN: Understand, AP: Apply, AN: Analyze, EL: Evaluate, CR: Create



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### Teaching and Examination Scheme:

Teaching Scheme (in hours)			Total Credits (L+T+PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Tutorial/Practical		
				ESE (E)	PA/CA (M)	PA/CA (I)	ESE (V)	
03	00	02	04	70	30	20	30	150

### Course Content:

Unit	Course Content	No of Hours	% of Weightage
1.	<b>Foundations of Human Computer Interaction</b> Input-output channels, Human memory, Thinking: reasoning and problem solving, Emotion, Text entry devices, Positioning, pointing and drawing, Display devices, Devices for virtual reality and 3D interaction, Models of interaction, Frameworks and HCI, Interaction styles, Interactivity, The context of the interaction, Paradigms of interaction	8	20%
2.	<b>Design Process</b> The process of design, User focus, Navigation design, Iterative design and prototyping, Elements of windowing systems, Programming the application, Using toolkits, Evaluation through expert analysis, Universal design principles, Requirements of user support, Approaches to user support, Adaptive help systems	11	25%
3.	<b>Models and Theories</b> Linguistic models, Physical and device models, Cognitive architecture, Face-to-face communication, Conversation, Text-based communication, Difference between task analysis and other techniques, Task decomposition, Sources of information and data collection, Uses of task analysis, Dialog design notations, Diagrammatic notations, Dialog analysis and design	9	20%
4.	<b>Ubiquitous Computing and Augmented Realities</b>	9	20%



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	Ubiquitous computing applications research, Virtual and augmented reality, Information and data visualization		
5.	<b>Recent Trends in the field of human computer interaction</b>	8	15%
<b>TOTAL</b>		<b>45</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	20	20	20	20	10

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

### Reference/Suggested Learning Resources:

#### (a) Books:

1. Human-Computer Interaction by Alan Dix, Janet Finlay, Gregory D. Abowd and Russell Beale  
Third Edition, Pearson Education
2. Designing with the Mind in Mind by Jeff Johnson, Morgan Kaufmann Publishers (Elsevier)
3. Human-Computer Interaction by I. Scott Mackenzie, Morgan Kaufmann Publishers (Elsevier)

#### (b) Open source software and website

- Course-related online MOOCs on NPTEL/SWAYAM platform.
- Recently Published papers/articles in reputed journals.



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## Suggested Course Practical List:

- The practical work will be carried out based on the content covered during the academic sessions.

**List of Laboratory/Learning Resources Required:** Programming development environment (open source is encouraged) related to the course content.

**Suggested Project List:** The subject teacher has to assign the relevant project work to the students in individual/team.

**Suggested Activities for Students:** The subject teacher has to assign the outcome based activities to the students in individual/team.

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