Nirma University
Institute of Technology, School of Technology
MTech Computer Science and Engineering / MTech Computer Science and Engineering (Information and Network Security)

Semester II

L	T	P	C
2	0	2	3

Course Code	3CS12D202
Course Title	Human Computer Interaction

Course Learning Outcomes (CLOs):
At the end of the course, students will be able to

1. evaluate user interfaces and detect usability problems by doing usability studies with human subjects
2. simulate how a user would understand and attempt to use an interface using an analytical method such as cognitive walkthrough
3. apply an appropriate interaction style for a given need
4. implement the HCI techniques to build multimodal GUI

Syllabus	Teaching hours

Unit 1   **5**
Introduction: Introduction to the field of HCI, HCI's and human factors engineering and user experience design. Human perception: perception, gestalt perception, information presentation: typography, color, graphic design, displays, paper, and other output devices, layout: forms design and information visualization, virtual reality, context-sensitive interfaces

Unit 2   **6**
User Interface Design and Principles: principles of HCI, ubiquity of feedback cycles, the importance of direct manipulation, and the extent of human abilities as they relate to computer interfaces, understanding of user tasks and activities, HCI heuristics. Creating good user interfaces: need-finding, prototyping potential interfaces, and evaluating those interfaces with users, research ethics underlying the design life cycle, as well as applications of this life cycle to the modern era of rapid prototyping

Unit 3   **12**
Interactive Devices, User Interfaces and Interaction styles: input devices and ergonomics: multi-touch, augmented reality, haptics, wearables, brain computer interfaces, and tangibles. Multimodal user interfaces: basic technologies for handling speech, vision, pen-based interaction, and other modalities, as well as various techniques for combining modalities. Interaction styles: metaphor, direct manipulation, widget survey, other interaction styles, and choosing among interaction styles

Unit 4   **7**
Applications: Exploration into the applications of HCI to open areas like augmented

reality, education, social computing, mental health, healthcare, medical science and assistive applications for differently abled

Self-Study:
The self-study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self-study contents.

Laboratory Work:
Students need to work on course project and implement the above mentioned learned concepts.

Suggested Readings^:
1. Ben Shneiderman, Catherine Plaisant, et al. Designing the User Interface, Addison Wesley
2. Preece, Sharp & Rogers, Interaction Design: Beyond Human-Computer Interaction, John Wiley & Sons
3. Dix A., Finlay J., Abowd G. D. and Beale R., Human Computer Interaction, Pearson Education.
4. Cooper, Reimann, Cronin, & Noessel., About Face: The Essentials of Interaction Design, Wiley
5. Preece J., Rogers Y., Sharp H., Baniyon D., Holland S. and Carey T., Human Computer Interaction, Addison-Wesley.
6. B.Shneiderman, Designing the User Interface, Addison Wesley (Indian Reprint)
7. Research Papers related to HCI applications and core research

L=Lecture, T=Tutorial, P=Practical, C=Credit

^this is not an exhaustive list