INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

HUMAN COMPUTER INTERACTION (UI & UX)								
VIII Semester: CSE | IT **VI Semester: CSE (AI&ML)**								
Course Code	**Category**	**Hours /Week**			**Credits**	**Maximum Marks**		
ACAD14	**Elective**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		3	0	0	3	40	60	100
Contact Classes:48	**Tutorials Classes: Nil**	**Practical Classes: Nil**				**Total Classes: 48**		
Prerequisite: Computer Networks								

I. COURSE OVERVIEW:

This course provides a comprehensive foundation in designing interactive systems with a human-centered approach. It covers the entire design lifecycle from understanding user needs to envisioning, designing, and evaluating user interfaces. Students will explore a variety of interface types including visual, multimodal, mobile, and wearable systems, and gain hands-on experience with techniques such as prototyping, persona development, and field research. The course also addresses design challenges in specific contexts such as websites, collaborative environments, and ubiquitous computing. This course will thus provide a background for students to practice system design, selection, installation, evaluation, and use with the knowledge of human characteristics, interaction styles, use context, task characteristics, and design processes.

II. COURSE OBJECTIVES:

The students will try to learn:

I. The principles of human-centered design in the development of interactive systems.
II. The appropriate design techniques such as participative design, prototyping, and evaluation to build effective and usable interfaces.
III. The design of interactive systems across various domains including websites, mobile devices, wearable technologies, and collaborative environments.

III. COURSE OUTCOMES

CO1	Identify and explain the key concerns and skills involved in designing interactive systems.
CO2	Apply scenario-based and participatory techniques to understand user requirements and behavior.
CO3	Develop conceptual, visual, and physical designs for user interfaces using appropriate metaphors and interaction principles.
CO4	Conduct expert and user-based evaluations of interactive systems and interpret the results to improve design.
CO5	Design interfaces for specific domains including websites, social media, and collaborative environments.
CO6	Analyze and design interaction systems for ubiquitous, mobile, and wearable computing environments considering context-awareness and usability.

IV. COURSE CONTENT:

MODULE -I: ESSENTIALS OF DESIGNING INTERACTIVE SYSTEMS (10)

Designing interactive systems: a fusion of skills: The variety of interactive systems - The concerns of interactive systems design-Being digital-The skills of the interactive systems designer-Why being human-centered is important; The process of human-centered interactive systems design: Introduction- Developing personas and scenarios- Using scenarios throughout design - A scenario-based design method.

MODULE -II: TECHNIQUES FOR DESIGNING INTERACTIVE SYSTEMS (10)

Understanding: Understanding requirements- Participative design- Interviews- Questionnaires- Probes- Card sorting techniques-Working with groups - Fieldwork: observing activities in situ - Artefact collection and 'desk work'; Envisionment: Finding suitable representations- Basic techniques- Prototypes- Envisionment in practice; Design Introduction-Conceptual design- Metaphors in design- Conceptual design using scenarios - Physical design- Designing interactions; Evaluation Introduction -Expert evaluation -Participant-based evaluation - Evaluation in practice -Evaluation: further issues

MODULE -III: VISUAL INTERFACE DESIGN, MULTIMODAL INTERFACE DESIGN (09)

Visual interface design: Introduction, Graphical user interfaces, interface design guidelines, psychological principles and interface design, information design, visualization.

Multimodal interface design: Introduction, interacting in mixed reality, using sound at the interface, tangible interaction, gestural interaction and surface computing

MODULE -IV: CONTEXTS FOR DESIGNING INTERACTIVE SYSTEMS (09)

Designing websites 3io: Introduction, website development, the information architecture of websites, navigation design for websites; Case study: designing the Robert Louis Stevenson website; Social media: Introduction, background ideas, Social networking, Sharing with others, the developing web; Collaborative environments: Introduction, issues for cooperative working, technologies to support cooperative working, collaborative virtual environments; Case study: Developing a collaborative tabletop application.

MODULE -V: UBIQUITOUS COMPUTING, MOBILE COMPUTING, WEARABLE COMPUTING (10)

Ubiquitous computing: Information spaces, blended spaces, home environments, navigating in wireless sensor networks; Mobile computing: Introduction, context awareness, understanding in mobile computing, designing for mobiles, evaluation for mobile computing; Wearable computing Introduction: Smart materials, material design, from materials to implants.

V. TEXT BOOKS:

1. David R. Benyon, “Designing Interactive Systems: A Comprehensive Guide to HCI, UX and Interaction Design”, Pearson; 3rd Edition, 2013.
2. James Cabrera, “Modular Design Frameworks: A Projects-based Guide for UI/UX Designers”, Apress, 1st Edition, 2017.
3. Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, “Human Computer Interaction”, Pearson Education, 3rd Edition, 2004.

VI. REFERENCE BOOKS:

1. Ben Schneiderman, “Designing the User Interface”, Pearson Education Asia, 3rd Edition, 2013.
2. Prece, Rogers, Sharps, “Interaction Design”, Wiley Dreamtech.
3. Soren Lauesen, “User Interface Design”, Pearson Education.
4. D. R. Olsen, “Human Computer Interaction”, Cengage Learning.
5. Smith –Atakan, “Human Computer Interaction”, Cengage Learning

VII. ELECTRONICS RESOURCES:

1. http://staff.fit.ac.cy/com.ph/vp/VP_Lecture_2.pdf
2. https://fac.ksu.edu.sa/nmalmobarak/course/41031
3. https://www.tutorialspoint.com/human_computer_interface/quick_guide.html

VIII. MATERIAL ONLINE:

1. Course template
2. Tutorial question bank
3. Tech-talk topics
4. Open-ended experiments

5. Definitions and terminology
6. Assignments
7. Model question paper – I
8. Model question paper – II
9. Lecture notes
10. PowerPoint presentation
11. E-Learning Readiness Videos (ELRV)