Approved in 44th BoA Meeting (24-11-2021)

Course number : CS551
Course Name : Human Computer Interaction
Credit Distribution : 3-0-0-3
Intended for : B. Tech./Masters/Ph.D.
Prerequisite : A programming course at the undergraduate level involving the use of Python, C#, HTML, or JavaScript for interface design.
Mutual Exclusion : None

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1. Preamble:

This course will provide the skills to students for creating highly usable computer systems. It will also help students to advance the HCI theory and practice. Topics in the course would cut across human perception, ergonomics, cognition, psychology, task analysis, user interface design, interface programming, and system evaluation. Upon completing this course students would be able to evaluate user interfaces with human participants; apply cognitive walkthroughs to simulate a user's experience of an interface; be able to break a graphical user interface (GUI) activity sequence into the component actions; be able to choose an appropriate interaction design for a given need; and, be able to implement simple GUIs.

2. Course Modules with quantitative lecture hours:

Introduction to HCI **(08 Hours)**
Course overview; goals in HCI; importance of design for usability; usability goals and metrics; historical perspective: machinery, computers, PCs and GUIs, and the Internet; different types of users; usability guidelines, principles, and theories of attention, perception, memory, and decision making.

User experience and design **(12 Hours)**
Different methods and frameworks of design; tools, practices, and patterns of design; social impact analysis; task decomposition; cognitive walkthroughs; expert reviews and heuristics; heuristic evaluation; guidelines of usability; active use evaluation; motion and time studies; GOMS keystroke-level models; human-study methodologies and techniques; survey and interview instruments; metaphors; storyboards; acceptance tests; ethical issues; design cases.

Interaction Design **(10 Hours)**
Direct manipulation; 2D devices and 3D interfaces; teleoperation and presence; augmented and virtual augmented reality; certain design patterns; fluid navigation; speech recognition and production; human language technology; traditional command languages; models of collaboration and contexts; deciding the appropriate interaction design.

Design choices **(12 Hours)**

Choices for user experience (animation, color, error handling, etc.); timing of user experience (system response time influence); help menus; information search; data types and data visualizations; grand challenges and future interfaces.

3. Text books:

Ben Shneiderman, Catherine Plaisant, Maxine Cohen, Steven Jacobs, Niklas Elmqvist, and Nicholas Diakopoulos, Designing the User Interface: Strategies for Effective Human-Computer Interaction, 6th Edition, Pearson, USA, 2016

Dan R. Olsen Jr., Building Interactive Systems: Principles for Human-Computer Interaction, Cengage, 2010.

4. References:

Jeff Johnson, Designing with the Mind in Mind: Simple Guide to Understanding User Interface Design Guidelines, 3rd edition, Morgan Kaufmann, 2020.

Jenifer Tidwell, Charles Brewer, Aynne Valencia, Designing Interfaces: Patterns for Effective Interaction Design 3rd Edition, O'Reilly Media, 2020

Materials from other online sources [link1], [link2], and [link3]

5. Similarity with the existing courses:

(Similarity content is declared as per the number of lecture hours on similar topics)

S. No.		Course Code	Similarity Content	Approx. % of Content
1.		None	NA	NA

6. Justification of new course proposal if cumulative similarity content is >30%:

Indian Institute of Technology Mandi