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| Devi Ahilya University, Indore, India Institute of Engineering & Technology | | | | IVYear B.E. (Computer Engg.) (Full Time) | | | |
| Subject Code & Name | Instructions Hours per Week | | | Credits | | | |
| CER8E5 | L | T | P | L | T | P | Total |
| Human Computer Interaction | 3 | 1 | 2 | 3 | 1 | 1 | 5 |
| Duration of Theory Paper:3 Hours | | | | | | | |

Learning Objectives:

Acquire the knowledge and skills needed to create highly usable software systems. Prepare to contribute to the advancement of Human-Computer Interaction theory and practice.

Pre requisites:

Algorithms, Programming skill in some practical programming language such as Java, C#, HTML.

COURSE OF CONTENTS

Unit 1:

Why Design for Usability? Historical Perspective: machinery, computers, PCs and GUIs, the Web, Possible Futures

Usability Analysis: Error Handling, Error Prevention, Cognitive Walkthroughs, Heuristic Evaluation, Usability Guidelines, Choosing Among Usability Methods

Unit 2:

Task Analysis, User-Centered Design: Systems Analysis, Techniques: Task Decomposition, CARD, Ethnographic Observation, Allocation of Functions; Usability Engineering in the Business Context.

Interaction Styles, Higher Cognition: Metaphor (in-class exercise), Direct Manipulation, Widget Survey, Other Interaction Styles, Choosing among Interaction Styles

Unit 3:

Specifying and Prototyping: Low-Fidelity Prototyping, Transition Diagrams, Visual Basic Prototyping.

Human Perception, Information Presentation, Layout: Perception, gestalt perception, typography, Color, Graphic design, Displays, Paper, and other Output Devices, Forms Design 6. Information Visualization.

Unit 4:

Interface Implementation: Events and Handlers, The Model-View-Controller Design Pattern, Responsiveness Issues, Time-scales and the Illusion of Multi-Tasking.

The Human Body and Device Design: Input Devices and Ergonomics, Virtual Reality.

Unit 5:

Web, Mobile, Speech and Multimodal, Groupware, Games, etc

Learning Outcomes

Upon successful completion of this course, students will be able to:

- [1] Evaluate user interfaces and detect usability problems by doing usability studies (observations) with human subjects
- [2] Visualize/simulate how a user would understand and attempt to use an interface using an analytical method such as the cognitive walkthrough
- [3] Break down a complex activity sequence into its component actions using hierarchical task decomposition
- [4] Assign functions appropriately to the human and to the machine
- [5] Choose an appropriate interaction style for a given need (GUI, command-line, natural language, etc.)
- [6] Come up with a suitable layout of widgets and display elements for a GUI window
- [7] Develop a suitable organization and navigation scheme for a moderate-sized Website
- [8] Perform a comprehensive task analysis, including ethnographic observation and use case development, for a single-user task of moderate complexity
- [9] Explain how interface design is ultimately dependent on human perception and cognition
- [10] Specify the desired behavior of an interface or interface component with a state-transition diagram

RECOMMENDED BOOKS:

- [1] Designing the User Interface, 6 th Edition. Ben Shneiderman, Catherine Plaisant, et al., Addison Wesley, 2017.
- [2] Interaction Design: Beyond Human-Computer Interaction, Helen Sharp, Jennifer Preece, Yvonne Rogers, Wiley; 5 edition (May 29, 2019)
- [3] Doing Better Statistics in Human-Computer Interaction, Paul Cairns, Cambridge University Press (March 28, 2019)
- [4] New Directions in Music and Human-Computer Interaction, (Springer Series on Cultural Computing), by Simon Holland (Editor), Tom Mudd (Editor), Katie Wilkie-McKenna (Editor), Andrew McPherson (Editor), Marcelo M. Wanderley (Editor). Springer; 1st ed. 2019 edition (February 7, 2019)