Course Code	Course Title				Category
18BTIT634	Professional Elective-I: Usability Engineering				DEC
Contact Hours per Week			CA	FE	Credits
L	T	D/P			
4	0	0	40	60	4

COURSE CONTENTS

Course Objectives:

1. To introduce the need for human-computer-interaction study or human-centered software design.
2. To understand usability engineering lifecycle for designing a user-friendly software and enhancing user-experience by interaction and GUI design process.
3. To understand usability evaluation skills and industry standards for software testing designing and evaluating use-interfaces.
4. To understand the current trends in usability engineering for developing human centric applications.

I.**HCI AND USABILITY** **(5)**

What is HCI design? Disciplines contributing to HCI, Psychology of everyday things, Importance of human factors in design, Need Satisfaction curve of technology, Levels of human computer interaction. WhatisUsability? Benefits and cost savings,usability slogans, attributes of system acceptability, definition of usability, usability trade Offs, categories of users and individual user differences,generations of user interfaces,scenario-based usability engineering case study - A Virtual Science Fair.

II.THE USABILITY ENGINEERING LIFECYCLE **(10)**

User research and requirements analysis: Know the user, user-profile questionnaire, field-study methods, contextual inquiry and analysis, hierarchical task analysis, ethnography, cultural probe, affinity diagramming, persona, scenarios of use, use cases. Iterative Design: Setting usability criteria or goals, participatory design (getting users involved), guidelines and heuristic evaluation, prototyping and scenarios, examples of problem scenarios, Iterative design ,interface evaluation, meta methods.

Usability Heuristics:simple and natural dialogue, speak the users' language, minimize user memory load, consistency, feedback,clearly marked exits, shortcuts, good error messages, prevent errors, help and documentation, heuristic evaluation.

III.INFORMATION DESIGN AND INTERACTION DESIGN **(10)**

Information design: Information architecture concepts, stages of action in human computer interaction, perceiving information, interpreting information, making sense of information. Interaction Design:selecting system goal, planning action sequence, executing action sequence, case study of information and interaction design. User Interface Design: Goals of UID, User Interface Models, conceptual model and mock-ups of GUI, Choosing prototyping alternatives-

paper prototyping, rapid prototyping, storyboarding, wire frames, Cost/benefit of good interface design, Case Study.

IV.USABILITY EVALUATION (10)

Developing usability specifications for evaluation - case study, criteria for user feedback techniques, Formative and summative techniques of evaluation Usability Inspections (testing without users):
Heuristic evaluation, user-interface guideline reviews, cognitive walkthrough, model based analysis Usability Testing (testing with users: developing usability or test specifications with case study , test goals and test plans, getting test users, choosing experimenters, ethical aspects of tests with human subjects, test tasks, stages of test, performance measurement, thinking-aloud testing, usability laboratories, remote evaluation, Methods beyond testing: observation, user satisfaction questionnaire (rating scale), interviews, system usability scale (SUS),focus groups,logging actual use, user feedback, choosing a methods**.**

V. USER-INTERFACE AND USABILITY STANDARDS WITH RECENT ADVANCES AND TRENDS (10)

User benefits, vendor benefits, dangers of standards, principles of good UI design, national-International standards, internationalization–international GUI, guidelines for internationalization,localization and multi local interfaces,UIstandards control standards, window standards,dialog box standards,messagebox standards,device interaction standards, feedback standards, developing styleguide and toolkits,user documentation-manuals,tutorials,information in the interface. Theoretical solutions, technological solutions, CAUSE tools, emerging paradigms of user interaction-collaborative systems, ubiquitous computing, intelligent user interfaces, simulation and virtual reality, case study, usability issues in organizations case studies, organizational roles and structures, ethics of usability, web analytics.

Course Outcomes:

The students of this course will be able to:

1. Identify the need to study human-computer-interaction or human-factors while designing software.
2. Understand the process of designing user-friendly software based on usability engineering guidelines.
3. Apply interaction design and UI design process in enhancing user-experience of an application.
4. Understand industry standards for designing and evaluating user-interfaces for current trends in usability engineering.

TEXT BOOKS:

1. Nielsen, J. (1994), "Usability Engineering", Elsevier.
2. Rosson, M. B., & Carroll, J. M. (2001), " Usability Engineering: Scenario Baseddevelopment of human-computer interaction", Elsevier.

REFERENCE BOOKS:

1. Cooper A. et. al. (2007), " The Essentials of Interaction Design", Wiley
2. Cooper, A. (1995)," The Essentials of User Interface Design", IDG Books, New Delhi

3. Schneiderman, B. (2005), " Designing the User Interface", Pearson Education, New Delhi
4. Dix A. et. al.(1993), " Human - Computer Interaction", Prentice Hall, USA
5. Mandel, T. , " Elements of User Interface Design", John Wiley & Sons

(https://slideplayer.com/slide/12776247/)

Usability is **a quality attribute that assesses how easy user interfaces are to use**. The word "usability" also refers to methods for improving ease-of-use during the design process.

https://www.nngroup.com/articles/usability-101-introduction-to-usability/

Human-computer interaction (HCI) is **a design field that focuses on the interfaces between people and computers**. HCI incorporates multiple disciplines, such as computer science, psychology, human factors, and ergonomics, into one field. Learn the principles of HCI to help you create intuitive and usable interfaces.

Human-Computer Interaction Makes Interactions More Human

The design of an interface between humans and computers has a direct impact on the efficiency of the interaction between the two parties. HCI emerged in the 1980s with the popularization of personal computing. Computers were no longer being built just for experts, and the goal of HCI was to make all interaction with computers easy and efficient for broad groups of users at different skill levels.

HCI practitioners observe the ways in which people interact with computers and then design technologies to help them use computers more efficiently. The goal is to minimize interaction cost–the amount of physical and mental effort a user must exert when using the technology–and make interactions more human.

Is HCI the same as UX design?

HCI and UX design overlap, but UX design is industry-driven while HCI is research-focused. HCI is a multidisciplinary study that aims to help computers function more like actual human interactions.