## Short Syllabus

**BCSE415L Human Computer Interaction (3-0-0-3)**

HCI Foundations – I/O Channels, Memory, Interactive Systems, Display Devices; Human Factors as ICT Theory – Human Interfacing Processing, Human Problem Solving Model, Ergonomics; Design Interaction – Models and Principles, Screen Design, Navigation and flow, Information Presentation, Display Layout, HCI for Users with Disability; Interaction Design Models – Model Human Processor, Keyboard Level Model, GOMS-CMN-GOMS Analysis, State Transition Networks; Interfaces in HCI – Interface Selection Options, Wire Framing, Design Process; Validation – Various Testing – Evaluation; Advanced Concepts – Mobile Game Design, Communication Model, AR/VR, 3D.

| Course code | Course Title | L | T | P | C |
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| BCSE415L | Human Computer Interaction | 3 | 0 | 0 | 3 |
| Pre-requisite | NIL | Syllabus version | | | |
| | | 1.0 | | | |

**Course Objectives**

Learn the importance of a good interface design
Understand the importance of human psychology in designing good interfaces

**Course Outcomes**

1. To design and develop processes and life cycle of Human Computer Interaction
2. To analyze product usability evaluations and testing methods
3. To apply the interface design standards/guidelines for cross cultural and disabled users
4. To categorize, design and develop human computer interaction in proper architectural structures

| Module: 1 | HCI Foundations | 6 hours |
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Input–output channels - Human memory - Thinking: reasoning and problem solving – Emotion - Individual differences - Psychology and the design of interactive systems - Text entry devices - Positioning, pointing and drawing - Display devices - Devices for virtual reality and 3D interaction.

| Module: 2 | Human Factors as HCI Theory | 5 hours |
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Human Information Processing – Task Modeling and Human Problem Solving model - Human Reaction and Prediction of Cognitive Performance - Sensation and Perception of Information - Human Body Ergonomics.

| Module:3 | Design Interaction | 7 hours |
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Shneideman's eight golden rules - Norman's Seven principles - Screen Design - Design goals – Screen planning and purpose - Organizing screen elements – Ordering of screen data and content – screen navigation and flow – Visually pleasing composition – Amount of information – Focus and emphasis – Presentation information simply and meaningfully – Information retrieval on web – Statistical graphics – Technological consideration in interface design - Visual Display Layout - Information Structuring and Navigation - HCI in Software process - Design Rules - HCI for Users with Disability - Mobile devices - Earcon design for aural interface.

| Module: 4 | Interaction Design Models | 6 hours |
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Model Human Processor - Working Memory - Long-Term Memory - Processor Timing - Keyboard Level Model – Operators - Encoding Methods - Heuristics for M Operator Placement – Keyboard Level Model - Application of the Keyboard Level Model - GOMS – CMN - GOMS Analysis - Modeling Structure - State Transition Networks.

| Module: 5 | Interface in HCI | 6 hours |
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Visual Interface -Emotion in HCI - Knowledge driven in HCI - Multi user Interaction - Interface Selection Options - Wire-Framing - Process of design - User focus - Scenarios - Navigation design - Screen design and layout, Iteration and prototyping – Multimedia - Colors.

| Module: 6 | Validation | 5 hours |
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Validations - Usability Testing - Interface Testing - User Acceptance Testing - Heuristic evaluation - Defining user experience - Goals and types of Evaluation - Evaluation through Expert analysis -Evaluation through user Participation - Choosing an evaluation method.

| Module: 7 | Advanced Concepts | 8 hours |
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Augmented and Virtual Reality - Applications of augmented reality - Information and data visualization - Principle of game design - Applications - Games Mobile Ecosystem: Platforms, Mobile Design: Elements of Mobile Design - Collaboration and communication - Face-to-face communication - Conversation - Text-based communication - Group working - Dialog design notations - Diagrammatic notations - Textual dialog notations - Dialog semantics - Dialog analysis and design Human factors and security - Groupware - Meeting

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| and decision support systems - Shared applications and artifacts - Frameworks for groupware - Implementing synchronous groupware - Mixed-Augmented and Virtual Reality - 3D UIs - Multimedia UI's | | |
| **Module: 8** | **Contemporary Issues** | **2 hours** |
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| | **Total Lecture Hours:** | **45 hours** |
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| **Text Book(s)** | | |
| 1 | Gerard Jounghyun Kim, "Human Computer Interaction – Fundamentals and Practice", CRC press, 2015. | |
| **Reference Books** | | |
| 1 | Regina Bernhaupt,"Game User Experience Evaluation", Kindle 2015. | |
| 2 | Martin Helander, "Handbook of Human-Computer Interaction", Elsevier publications, 1988. | |

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| Mode of Evaluation: CAT, Assignment, Quiz and FAT | | | |
| Recommended by Board of Studies | 13 – 05 - 2022 | | |
| Approved by Academic Council | No.66 | Date | 16.06.2022 |