BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, Pilani
Pilani Campus
AUGS/ AGSR Division

FIRST SEMESTER 2020-21
COURSE HANDOUT

Date: 17.08.2020

In addition to part I (General Handout for all courses appended to the Timetable) this portion gives further specific details regarding the course.

Course No : **BITS F364**
Course Title : **Human Computer Interaction**
Instructor-in-Charge : **MUKESH KUMAR ROHIL (rohil@pilani.bits-pilani.ac.in)**
Instructor(s) : **- N.A. -**
Tutorial/Practical Instructors: - N.A. -

Course Description: Principles of human-computer interaction (HCI); Evaluation of user interfaces; Usability engineering; Task analysis, user-centered design, and prototyping; Conceptual models and metaphors; Software design rationale; Design of windows, menus, and commands. Voice and natural language I/O; Response time and feedback; Color, icons, and sound; Internationalization and localization; User interface architectures and APIs.

Scope and Objective of the Course: This course introduces the students to the theories, practices and thumb rules of designing interfaces for humans to interact with machines and to the design prototype-evaluate cycles of HCI. Objectives include, introduction to the concepts of Human Computer Interaction through four components i.e. Human & Computer, Interaction Design, and Evaluation of Interaction, and Advanced Concepts with algorithmic and advanced modeling aspects along with, applications in 3D graphics and visualization. The course will introduce students to the importance of keeping the users at the center of the design process, including the capabilities and aspirations of the users, and managing other stakeholders. Students will study the different communication media available for interface designing and the properties of each medium. Within each medium emphasis will be on how to design, prototype and evaluate interfaces, with the focus on usability. After successful completion of the course student should be able to apply the concepts and techniques to various problem domain, interaction simulation, and visualization of data sets and processes.

Textbook:
T1: Alan Dix, Janet Finlay, Gregory D. Abowd, Russell Beale; "Human-Computer Interaction"; 3rd Edition, 2008, Pearson Education India
T2: Don Norman; "The Design of Everyday Things"; 2013; Basic Books (A Member of the Perseus Books Group)

Reference Books:
R1: Jonathan Lazar, Jinjuan Heidi Feng, and Harry Hochheiser; Research Methods in Human-Computer Interaction; 2nd Edition, Morgan Kaufmann, 2017.
R2: Alexandru C. Telea; Data Visualization: Principles and Practice, Second Edition; 2nd Edition; CRC Press, 2014.

5. Course Plan:

Lecture#	Learning Objectives	Topics	Reference to Text
01-03	Overview	The Human: Introduction, Input-Output Channels, Human Memory, Thinking: Reasoning & Problem Solving, Emotion, Individual differences, Psychology and the design of interactive systems	T1.Ch.1
04-06	Introduction to Interaction Devices	The computer: Introduction, Text entry devices, Positioning, pointing and drawing, Display devices, Devices for virtual reality and 3D interaction, Positioning in 3D, Physical controls, sensors and special devices, Paper: printing and scanning, Memory, Processing and networks	T1.Ch.2
07-10	Interaction Fundamentals	The interaction: Introduction, Models of interaction, Frameworks and HCI, Ergonomics, Arrangement of controls and displays, Interaction styles, Elements of the WIMP-interface, Interactivity, The context of the interaction, Experience engagement and fun	T1.Ch.3
11-13	Paradigms	Paradigms: Introduction, Paradigms for interaction	T1.Ch.4
14-17	Interaction Design and Designing with different media	Interaction design basics: Introduction, What is design?, The process of design, User focus, Scenarios, Navigation design, Screen design and layout, Iteration and prototyping(hill-climbing approach), Designing for different media: Web, mobile apps, visual, audio, text, etc., Accessibility in different media	T1.Ch.5 T2.Ch 2,3
18-21	HCI in Software Process	HCI in the software process: Introduction, The software life cycle, Usability engineering, Problems with usability engineering, Iterative design and prototyping, Design Rationale	T1.Ch.6
22-25	Interaction Evaluation	Evaluation techniques: Introduction, Goals of evaluation, Evaluation through expert analysis, evaluation through user participation, Choosing an evaluation method, errors, Human errors and types, designing for errors	T1.Ch.9 T2.Ch.5 R1.Ch13
26-29	Universal Design	Universal design: Introduction, Universal design principles, Multi-modal interaction, Designing for	T1.Ch.10

Lecture#	Learning Objectives	Topics	Reference to Text
		diversity	
30-32	User Support	User support: Introduction, Requirements of user support, Approaches to user support, Adaptive help systems, Designing user support systems	T1.Ch.11
33-36	Groupware	Groupware: Introduction, Groupware systems, Computer-mediated communication, Meeting and decision support systems, Shared applications and artifacts	T1.Ch.19
37-39	Ubiquitous computing and augmented realities	Ubiquitous computing and augmented realities: Introduction, Ubiquitous computing applications research, Virtual and augmented reality, Information and data visualization	T1.Ch.20, R2.Ch1.1,1.2,1.4, R2.Ch2
40-41	Advance topics	Internationalization and localization; User interface architectures and APIs.	Class Notes

6. Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of component (Close Book/ Open Book)
Test-I	30 min.	15%	Wednesday, Sept 16, 2020 10:05 AM to 10:35 AM	Open Book
Test-II	30 min.	15%	Wednesday, Oct 14, 2020 10:05 AM to 10:35 AM	Open Book
Test-III	30 min.	15%	Wednesday, Nov 11, 2020 10:05 AM to 10:35 AM	Open Book
Project/Assignments	-	20%	Details will be notified.	Open Book/Take Home
Comprehensive Examination	2 hrs	35%	<TEST_C> December 01, 2020 FN	Closed Book

7. Chamber Consultation Hour: Wednesday, 9th Hour (04:00 PM to 04:50 PM).

8. Notices: All the notices concerning this course will be displayed on the course page hosted at Nalanda-LMS only.

9. Make-up Policy: Make-up may be granted in case of extreme exigencies, if permission is sought from the Instructor-in-Charge.

10. Note (if any): If the marks-histogram emerges as not skewed, then a student getting marks, say marks *m* out of maximum marks, *MM*, such that (MM*m/*Acut*) < 15*(*MM*/100), where *Acut* is the cutoff (recommended as per the histogram) for A grade, may be recommended to be reported an NC.

Instructor-in-Charge
BITS F364