INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad -500 043

COMPUTER SCEINCE AND ENGINEERING

COURSE DESCRIPTOR

Course Title	HUMAN AND COMPUTER INTERACTION				
Course Code	BCSB16				
Programme	M.Tech				
Semester	II	CSE			
Course Type	Open Elective-I				
Regulation	IARE – R18				
Course Structure	**Theory**			**Practical**	
	Lectures	**Tutorials**	**Credits**	**Laboratory**	**Credits**
	3	-	3	2	2
Chief Coordinator	Mr. C.Praveen Kumar Professor, CSE.				
Course Faculty	Mr C.Praveen Kumar, Assistant Professor, CSE.				

I.   COURSE OVERVIEW:

This course is an introduction to Human-Computer Interaction (HCI), a discipline concerned with the design, evaluation, and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them. The course considers the inherently multi- and interdisciplinary nature of HCI and situates various HCI issues in the organizational and societal contexts. It introduces theories of human psychology, principles of computer systems and user interfaces designs, a methodology of developing effective HCI for information systems, and issues involved in using technologies for different purposes. It is intended to give students an overview of the entire HCI field by covering most aspects of it. This course will thus provide a background for students to practice system design, selection, installation, evaluation, and use with the knowledge of human characteristics, interaction styles, use context, task characteristics, and design processes.

II.   COURSE PRE-REQUISITES:

Level	Course Code	Semester	Prerequisites
PG	BCS208	II	Significant experience using computers and HCI based applications, and ability to create simple web pages.

III. MARKSDISTRIBUTION:

Subject	SEE Examination	CIA Examination	Total Marks
Human And Computer Interaction	70 Marks	30 Marks	100

IV. DELIVERY / INSTRUCTIONAL METHODOLOGIES:

✔	Chalk & Talk	✔	Quiz	✔	Assignments	✔	MOOCs
✔	LCD / PPT	✔	Seminars	✔	Mini Project	✘	Videos
✘	Open Ended Experiments						

V. EVALUATION METHODOLOGY:

The course will be evaluated for a total of 100 marks, with 30 marks for Continuous Internal Assessment (CIA) and 70 marks for Semester End Examination (SEE). Out of 30 marks allotted for CIA during the semester, marks are awarded by taking average of two CIA examinations or the marks scored in the make-up examination.

Semester End Examination (SEE): The SEE is conducted for 70 marks of 3 hours duration. The syllabus for the theory courses is divided into five units and each module carries equal weight age in terms of marks distribution. The question paper pattern is as follows. Two full questions with "either" or "choice" will be drawn from each module. Each question carries 14 marks. There could be a maximum of two sub divisions in a question.

The emphasis on the questions is broadly based on the following criteria:

50 %	To test the objectiveness of the concept.
50 %	To test the analytical skill of the concept OR to test the application skill of the concept.

Continuous Internal Assessment (CIA):
CIA is conducted for a total of 30 marks (Table 1), with 20 marks for Continuous Internal Examination (CIE), 05 marks for Quiz and 05 marks for Alternative Assessment Tool (AAT).

Table 1: Assessment pattern for CIA

Component	Theory			Total Marks
Type of Assessment	CIE Exam	Quiz	AAT	
CIA Marks	20	05	05	30

Continuous Internal Examination (CIE):
Two CIE exams shall be conducted at the end of the 8th and 16th week of the semester respectively. The CIE exam is conducted for 20 marks of 2 hours duration consisting of five descriptive type questions out of which four questions have to be answered where, each question carries 5 marks. Marks are awarded by taking average of marks scored in two CIE exams.

Quiz - Online Examination:

Two Quiz exams shall be online examination consisting of 25 multiple choice questions and are to be answered by choosing the correct answer from a given set of choices (commonly four). Such a question paper shall be useful in testing of knowledge, skills, application, analysis, evaluation and understanding of the students. Marks shall be awarded considering the average of two quiz examinations for every course.

Alternative Assessment Tool (AAT):
This AAT enables faculty to design own assessment patterns during the CIA. The AAT converts the classroom into an effective learning centre. The AAT may include tutorial hours/classes, seminars, assignments, term paper, open ended experiments, METE (Modeling and Experimental Tools in Engineering), five minutes video, MOOCs etc.
The AAT chosen for this course is given in section XI.

VI. HOW PROGRAM OUTCOMES ARE ASSESSED:

	Program Outcomes (POs)	Strength	Proficiency assessed by
PO1	Ability to apply acquired knowledge of science and engineering fundamentals in problem solving **(Engineering Knowledge)**.	3	Assignment, Tutorials
PO2	Ability to undertake problem identification, formulation and providing optimum solution in software applications **(Problem Analysis)**.	2	Assignments
PO3	Ability to utilize systems approach in designing and to evaluate operational performance of developed software. **(Design/Development of Solutions).**	3	Project
PO4	Post Graduates will demonstrate an ability to identify, formulate and solve complex information technology related problems **(Conduct Investigations of Complex Problems).**	2	Project
PO5	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations **(Modern Tool Usage).**	3	Project
PO12	Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change **(Life-long learning)**.	2	Project

3 = High; 2 = Medium; 1 = Low

VII. HOW PROGRAM SPECIFIC OUTCOMES ARE ASSESSED:

	Program Specific Outcomes (PSOs)	Strength	Proficiency assessed by
PSO 1	**Professional Skills:** The ability to research, understand and implement computer programs in the areas related to algorithme,system software, multimedia ,web design, big data analytics, and networking for efficient analysis and design of computer based systems for varying complexity	3	Lectures,Assignment
PSO 2	**Problem-Solving Skills:**The ability to apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success	2	Projects

Program Specific Outcomes (PSOs)		Strength	Proficiency assessed by
PSO 3	**Successful Career and Entrepreneurship:** The ability to employ modern computer languages, environments, and platforms in creating innovative career paths, to be an entrepreneur, and a zest for higher studies.	2	Guest lectures

3 = High; 2 = Medium; 1 = Low

VIII. COURSE OBJECTIVES (COs):

The course should enable the students to:	
I	Demonstrate an understanding of guidelines, principles, and theories influencing human computer interaction.
II	Design, implement and evaluate effective and usable graphical computer interfaces.
III	Able to apply HCI principles, guidelines, methods, and techniques for human-centered information systems development

IX. COURSE LEARNING OUTCOMES (CLOs):

CLO Code	CLO's	At the end of the course, the student will have the ability to:	PO's Mapped	Strength of Mapping
BCS208.1	CLO 1	**Understand** literature of HCI.	PO 1	3
BCS208.2	CLO 2	**Understand and develop** importance of UI Importance of user interface definition	PO 1 ;PO 3	2
BCS208.3	CLO 3	**Retrieve** linearequations and **Understand** back propagation	PO 1;PO 2	2
BCS208.4	CLO 4	**Understand** Various Interface Design Goals.	PO 2;PO 3	2
BCS208.5	CLO 5	**Understand** Selecting the proper device based	PO 1;PO 3	2
BCS208.6	CLO 6	**Understand** the concepts of Introduction about software tools	PO 1;PO 4	2
BCS208.7	CLO 7	**Understand** the concepts of Image and Video Displays	PO 1;PO 4	3
BCS208.8	CLO 8	**Identify** Specification methods	PO 2	3
BCS208.9	CLO 9	**Understand** Selecting the proper device based controls.	PO 1;PO 2	2
BCS208.10	CLO 10	**Develop** various pointing devices .	PO 4	3
BCS208.11	CLO11	**Understand** formation rules and aggregation rules	PO 4	1
BCS208.12	CLO12	**Develop** presentation styles, types, management, window functions,, window operations about window	PO 3	3
BCS208.13	CLO13	**Understand** genetic algorithms, constraints and classifications.	PO1;PO 5	2
BCS208.14	CLO14	**Understand** Includes operable controls, selection controls, presentation controls etc	PO 3;PO 12	2

3 = High; 2 = Medium; 1 = Low

X. MAPPING COURSE LEARNING OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES:

Course Learning Outcomes (CLOs)	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CLO 1	3												3		
CLO 2	3		2										2		
CLO 3	2	3													
CLO 4		2	3											2	
CLO 5	3		2										2		
CLO 6	3			2										1	
CLO 7	3			2									3		
CLO 8		3													
CLO 9	3	2												1	
CLO 10				3											
CLO 11				2										1	
CLO 12			3												
CLO 13	2				3								3		
CLO 14			3									2			2

3 = High; 2 = Medium; 1 = Low

XI. ASSESSMENT METHODOLOGIES-DIRECT

CIE Exams	PO3	SEE Exams	PO 2	Assignments	PO 3	Seminars	PO 1,PO 2
Laboratory Practices	-	Student Viva	-	Mini Project	-	Certification	-
Term Paper	-						

XII. ASSESSMENT METHODOLOGIES-INDIRECT

✔	Early Semester Feedback	✔	End Semester OBE Feedback
✔	Assessment of Mini Projects by Experts		

XIII. SYLLABUS:

UNIT-I	INTRODUCTION
Human: I/O channels – Memory – Reasoning and problem solving; The computer: Devices – Memory –processing and networks; Interaction: Models – frameworks – Ergonomics – styles – elements – interactivity- Paradigms	

UNIT-II	INTERACTIVE DESIGN
Interactive Design basics – process – scenarios – navigation – screen design – Iteration and prototyping. HCI in software process – software life cycle – usability engineering – Prototyping in practice – design rationale. Design rules – principles, standards, guidelines, rules. Evaluation Techniques – Universal Design.	

UNIT-III	COGNITIVE MODELS
Cognitive models –Socio-Organizational issues and stake holder requirements – Communication and collaboration models-Hypertext, Multimedia and www	

UNIT-IV	MOBILE ECOSYSTEM
Mobile Ecosystem: Platforms, Application frameworks- Types of Mobile Applications: Widgets, Applications, Games- Mobile Information Architecture, Mobile 2.0, Mobile Design: Elements of Mobile Design, Tools.	

UNIT-V	WEB INTERFACES
Designing Web Interfaces – Drag & Drop, Direct Selection, Contextual Tools, Overlays, Inlays and Virtual Pages, Process Flow. Case Studies.	

Text Books:

1. Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, "Human Computer Interaction", Pearson Education, 3rd Edition, 2004.
2. Brian Fling, "Mobile Design and Development", O Reilly Media Inc., 1st Edition , 2009
3. Bill Scott and Theresa Neil, "Designing Web Interfaces", O Reilly, 1st Edition, 2009.

Reference Books:

1. http://www.sctie.iitkgp.ernet.in/
2. http://www.rkala.in/softcomputingvideos.php
3. http://www.sharbani.org/home2/soft-computing-1
4 .https://www.books.google.co.in/books?id=bVbj9nhvHd4C5.
5.. Mizutani,+Neuro,+Fuzzy+and+Soft+Computing,+PHI,+2004,Pearson+Education.

XIV. COURSE PLAN:

The course plan is meant as a guideline. Probably there may be changes.

Lecture No	Topic's to be covered	Course Learning Outcomes (CLOs)	Reference
1-3	Introduction about HCI.	CLO 1	T2:1.1-1.2
4-6	technological consideration in interface design	CLO 2	T1:2
7-9	Includes structures, functions, contents, formatting, phrasing, selecting.	CLO 3	T2:2.1-2.2
10-12	Associative styles, types, management, window functions,, window operations about windows	CLO 4	T1:4
13-16	Includes characteristics of Device- based controls	CLO 5	T1:4
17-19	Selecting the proper device based controls.	CLO 6	T1: 6
20-22	Fuzzy logic: Introduction to classical/crisp sets and fuzzy sets, classical/crisp relations and fuzzy Relations	CLO 7	T1: 5
23-25	Includes operable controls, selection controls, presentation controls etc	CLO 8	T1:7
26-28	Includes discussion about Icons and Multimedia	CLO 9	T1:10
29-31	Colors, and Color uses	CLO 10	T1:8
32-34	Specification methods	CLO 11	T1:13
35-37	Building tools Interface –Building	CLO 12	T1:9 T1:14 T1: 17
38-40	keyboard and function keys	CLO 13	T1:17
41-45	Speech Recognition, Digitization, and Generation	CLO 14	T1:16

Prepared by:

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