



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

INFORMATION TECHNOLOGY

COURSE DESCRIPTION

Course Title	HUMAN COMPUTER INTERACTION			
Course Code	A70531			
Regulation	R15			
Course Structure	Lectures	Tutorials	Practical	Credits
	4	1	-	4
Course Coordinator	Ms. B Pravallika, Assistant Professor, IT			

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. PREREQUISITES:

Level	Credits	Periods / Week	Prerequisites
UG	4	5	Significant experience using computers and GUI-based applications, and ability to create simple web pages.

III. COURSE ASSESSMENT METHODS:

Marks Distribution

Session Marks	University End Exam Marks	Total Marks
<p>There shall be 2 midterm examinations. Each midterm Examination Consists of subjective type and Objective type tests.</p> <p>The subjective test is for 10 marks, with duration of 1 hour. Subjective test shall contains 4 questions, the student has to answer 2 questions, each carrying 5 marks.</p> <p>The objective type test is for 10 marks with duration of 20 minutes. It consists of 10 Multiple choice and 10 objective type questions, the student has to answer all the questions and each carries half mark.</p> <p>First midterm examination shall be conducted for the first two and half units of syllabus and second midterm examination shall be conducted for the Remaining portion.</p> <p>Five marks are marked for assignments. There shall be two assignments in every theory course. Marks shall be awarded considering the average of two assignments in each course.</p>	75	100

IV. EVALUATION SCHEME:

S. No	Component	Duration	Marks
1	I Mid Examination	80 minutes	20
2	I Assignment	--	05
3	II Mid Examination	80 minutes	20
4	II Assignment	--	05
5	External Examination	3 hours	75

V. COURSE OBJECTIVES:

- 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. Describe and apply core theories, models and methodologies from the field of HCI.
- IV. Able to apply HCI principles, guidelines, methods, and techniques for human-centered information systems development.
- V. Use the information sources available, and be aware of the methodologies and technologies supporting advances in HCI.

VI. COURSE OUTCOMES:

1. Demonstrate Understanding of Interaction between the human and computer components.
2. Explain the human and computer components functions regarding interaction with computer.
3. Describe the key design principles for user interfaces.
4. Apply an interactive design process and universal design principles to designing HCI systems.
5. Understand key aspects of human psychology which can determine user actions at and satisfaction of the interface.
6. Employ selected design methods and evaluation methods at a basic level of competence.
7. Employ selected design methods and evaluation methods at a basic level of competence. And also describe the use of HCI design principles, standards and guidelines.

8. Build prototypes at varying levels of fidelity, from paper prototypes to functional, interactive prototype.
9. Discuss tasks and dialogs of relevant HCI systems based on task analysis and dialog design. And set up and carry out a process to gather requirements for, engage in iterative design of, and evaluate the usability of a user interface.
10. Analyze and discuss HCI issues in groupware, ubiquitous computing, virtual reality, multimedia, and Word Wide Web-related environments.
11. An understanding of the various software tools available to develop the good user interface.
12. Analyze and understand various interaction devices used and available to design and create good user interface.
13. Analyze and identify user models, user support, socio-organizational issues, and stakeholder requirements of HCI systems.
14. Discuss tasks and dialogs of relevant HCI systems based on task analysis and dialog design
15. Analyze and discuss HCI issues in groupware, ubiquitous computing, virtual reality, multimedia, and Word Wide Web-related environments.

VII. HOW PROGRAM OUTCOMES ARE ASSESSED:

Program Outcomes		Level	Proficiency assessed by
PO1	Ability to apply acquired knowledge of science and engineering fundamentals in problem solving	S	...
PO2	Ability to undertake problem identification, formulation and providing optimum solution in software applications.	S	Assignments.
PO3	Ability to utilize systems approach in designing and to evaluate operational performance of developed software.	H	Assignments real world scenarios.
PO4	Graduates will demonstrate an ability to identify, formulate and solve complex information technology related problems	N	----
PO5	Graduate will be capable to use modern tools and packages available for their professional arena.	H	Assignments real world scenarios.
PO6	Understanding of the social, cultural responsibilities as a professional engineer in a global context.	S	Assignments.
PO7	Understanding the impact of environment on engineering designs based on the principles of inter-disciplinary domains for sustainable development.	S	Assignments.
PO8	Ability to understand the role of ethics in professional environment and implementing them.	N	--
PO9	Competency in software development to function as an individual and in a team of multidisciplinary groups.	S	Assignments.
PO10	Ability to have verbal and written communication skills to use effectively, not only with engineers but also with the community at large.	N	-----
PO11	Ought to have strong fundamentals in Information Technology and be able to have lifelong learning required for professional and individual developments.	S	Assignments.
PO12	Be able to design, implement and manage projects in Information Technology with optimum financial resources with, environmental awareness and safety aspects.	H	Assignments real world scenarios.
N= None		S= Supportive	
		H = Highly Related	

VIII HOW PROGRAM SPECIFIC OUTCOMES ARE ASSESSED:

Program Specific Outcomes		Level	Proficiency assessed by
PSO1	Professional Skills: The ability to research, understand and implement computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient analysis and design of computer-based systems of varying complexity.	H	Lectures, Assignments
PSO2	Software Engineering practices: The ability to apply standard practices and strategies in software service management using open-ended programming environments with agility to deliver a quality service for business success.	S	Projects
PSO3	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.	H	Guest Lectures

N - None

S - Supportive

H - Highly Related

IX. SYLLABUS:

UNIT - I

Introduction: Importance of user Interface – definition, importance of good design. Benefits of good design. A brief history of Screen design.

The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

UNIT - II

Design process – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions.

Screen Designing : 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.

UNIT - III

Windows – New and Navigation schemes selection of window, selection of devices based and screen based controls.

Components – text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors.

UNIT - IV

Software tools – Specification methods, interface – Building Tools.

UNIT - V

Interaction Devices – Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

TEXT BOOKS:

1. The essential guide to user interface design, Wilbert O Galitz, Wiley DreamaTech.
2. Designing the user interface. 3rd Edition Ben Shneidermann , Pearson Education Asia.

REFERENCES:

1. Human – Computer Interaction. Alan Dix, Janet Finckay, Gre Goryd, Abowd, Russell Bealg, Pearson Education.
2. Interaction Design PRECE, ROGERS, SHARPS. Wiley Dreamtech,
3. User Interface Design, Soren Lauesen , Pearson Education.
4. Human- Computer Interaction, D. R. Olsen, Cengage Learning.
5. Human- Computer Interaction, Smith – Atakan, Cenage Learning.

X. COURSE PLAN:

Lecture No.	Course Learning Outcomes	Topics to be covered	Reference
1	Defining HCI introduction	Introduction about HCI	T1:pg-1-4
2	Demonstration about importance of UI	Importance of user interface definition	T1:pg-3-4
3	Discussion of importance of good design	importance of good design	T1:pg-4
4	Discussion about Benefits of good design	Benefits of good design	T1:pg-5
5	Demonstration of screen design history	A brief history of Screen Design	T1:pg-6
6	Demonstration of GUI	Introduction about GUI	T1:pg-15
7-9	Discussion about the GUI	Brief discussion about The Graphical User interface	T1:pg-15-23
9-10	Demonstration of Web user	Brief discussion about The Web User Interface	T1:pg-27-39
11	Discussion principles of UI Design	Principles of user interface	T1:pg-40
12	Discussion about user interface design process	Human interaction with computers	T1:pg-61-64
13-14	Demonstration about important human characteristics	Importance of human characteristics	T1:pg-65-71
15-16	Understanding of various Human	Human considerations in Design	T1:pg-72-81
17	Discussion of Human Interaction Speeds	Human Interaction Speeds	T1:pg-81-84
18	Demonstration of Definition and analysis of business	Business Definition and Requirements Analysis	T1:pg-87-96
19	Demonstration about Determining Basic business	Determining Basic business functions	T1:pg-97-103
20	Discussion of various design standards	Design Standards or Style Guides	T1:pg-104-106
21	Demonstration about System Training and Documentation	System Training and Documentation Needs.	T1:pg-107
22	Discussion about Screen Designing	Various Interface Design Goals	T1:pg-109-112
23	Understanding of Screen meaning and purpose	Screen meaning and purpose	T1:pg-113
24	Discussion of organizing screen elements.	Organizing Screen elements clearly and meaningfully	T1:pg-114
25	Discussion of screen data and content and screen navigation	Ordering screen data and content and screen navigation and flow	T1:pg-115
26-27	Demonstration of Visually pleasing composition	Visually Pleasing Composition	T1:pg-119

28	Discussion of amount of information	Amount of Information	T1:pg-138
29	Discussion of focus and emphasis	Focus and Emphasis	T1:pg-146
30	Demonstration of presenting information simply and	Presenting Information simply and meaningfully	T1:pg-151
31	Discussion of information retrieval on web	Information retrieval on web	T1:pg-192
32	Demonstration about types of statistical graphics	Types of Statistical Graphics	T1:pg-215
33	Understanding of various technological consideration in	technological consideration in interface design	T1:pg-226
34-36	Demonstration about Develop system menus and Navigation	Includes structures, functions, contents, formatting, phrasing, selecting	T1:pg-249
37-39	Discussion about selecting the proper kinds of windows	Includes characteristics, components, presentation styles, types, management, window functions,, window operations about windows	T1:pg-255-256
40	Discussion about selecting the proper device- based controls	Includes characteristics of Device- based controls	T1:pg-290
41	Discussion about selecting the proper device- based controls	Selecting the proper device based controls	T1:pg-385
42-43	Demonstration about choosing the proper screen based	Includes operable controls, selection controls, presentation controls etc.	T1:pg-386
44-45	Demonstration about Writing clear text and messages	Includes words, sentences, messages, text, window title, Text for web pages	T1:pg-517-540
46-47	Demonstration about Icons and multimedia	Includes discussion about Icons and Multimedia	T1:pg-605-617
48	Understanding how to choose the proper	Colors, and Color uses	T1:pg-621-626
49	Discussion about various problems	Possible problems with Colors	T1:pg-627-630
50-51	Demonstration about Choosing	Choosing the Colors	T1:pg-631-642
52	Demonstration about usage of software tools	Introduction about software tools	T2:pg-01-04
53-54	Discussion various specification methods	Specification methods	T2:pg-05-08
55	Demonstration Interface-Building tools	Interface –Building Tools	T2:pg-09-13
56	Discussion about various keyboard and function keys	Keyboard and Function keys	T2:pg-14-17
57	Discussion about various pointing devices	Various pointing devices	T2:pg-18-25
58	Understanding the usage of speech recognition,	Speech Recognition, Digitization, and Generation	T2:pg-28-31
59	Discussion about Image an Video Displays	Image and Video Displays	T2:pg-32-36
60	Discussion about drivers	Drivers	T2:pg-36-40

XI. MAPPING COURSE OBJECTIVES LEADING TO THE ACHIEVEMENT OF THE PROGRAM OUTCOMES:

Course Objectives	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
I	S												S		
II			H												S
III					S									H	
IV		H								S					S
V	S											H	H		

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XII. MAPPING COURSE OUTCOMES LEADING TO THE ACHIEVEMENT OF THE PROGRAM OUTCOMES:

Course Outcomes	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	S											S			S
2			S							S			S		
3		S			S										
4						S								H	
5		H													S
6	S								H						
7		H										S	S		
8		S													
9						H								H	
10							S					H			S
11			H						S				S		
12	H									S					
13		H												S	
14							H			S					
15		H										S			

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