COMSATS University Islamabad
Department of Computer Science
Course Description Form (CDF)

Course Information

Course Code: **CSC365** | Course Title: **HCI and Computer Graphics**
Credit Hours: **3(2,1)** | Lecture Hours/Week: **2**
Lab Hours/Week: **3** | Pre-Requisites: **None**

Course Objectives:

- To explain the human factors to be considered in the design of human computer interaction;
- To define different processes for designing interfaces for different contexts;
- To define and implement user-centered approach in software development process and apply suitable techniques for collecting user requirement and analyzing tasks;
- To discuss the evaluation and comparison of user interfaces using different techniques such as laboratory experiments and expert reviews;
- To apply different techniques learned throughout the course on a practical project.

Course Contents

This course covers the fundamental principles and methods related to Human-Computer Interaction (HCI). Topics include: Overview; Universal Design; PACT Analysis; Evaluation Measures; Conceptualizing Interaction; Data Gathering Techniques; Process for Human Centered Development; Evaluation with & without Users; Cognitive & Social Aspects; Interaction Technologies; and Case Studies.

Unit wise Major Topics:

Unit	Topic	No. of Teaching Hours
1.	Interaction Design: Introduction, Good Vs Bad Design, Principles of Good Design, Usability & User Experience Goals, Process; Universal Design; PACT Analysis; Evaluation Measures; Conceptualizing Interaction: Concept, Conceptual Models; Interface Metaphors & Interaction Types, and Paradigms.	6
2.	Data Gathering Techniques: Surveys, Interviews, Participant Observation, Focus Groups, Diary Studies, Quantitative & Qualitative data, and Analysis of Data.	3
3.	Process for Human Centered Development: Personas, Scenarios, Principles of GUIs, Elements of Visual Design, Task Analysis, Prototyping, User interface Standards, AgileUX, Design Patterns, and Data Visualization.	7
4.	Evaluation with & without Users: Heuristic Evaluation, Cognitive Walkthrough; Evaluation with Users: Formative Evaluation, Field Studies, Controlled Experiments, and Analytics & A/B Testing.	4
5.	Cognitive & Social Aspects: Memory, Attention, Cognitive Frameworks, Face-to-Face Vs Remote Conversations, Co-presence, Social Engagement; Emotional Interaction: Emotions & User Experience, Expressive Interfaces, Affective Computing & Emotional AI, Persuasive Technologies & Behavioral Changes, and Anthropomorphism.	5
6.	Interaction Technologies: Touch & Multi-Touch Interfaces, Speech	5

	Recognition, Natural Language Processing, Ubiquitous, Augmented & Virtual Reality; and Case Studies from Animation & Gaming industry.	
Total Contact Hours		**30**

Mapping of CLOs and GAs

Sr.#	Unit#	Course Learning Outcomes	Blooms Taxonomy Learning Level	GA
CLO's for Theory				
CLO-1	1	Recognize the principles & conceptualizing interaction for human-centered software development.	*Understanding*	2
CLO-2	2	Apply Human centered data gathering processes.	*Applying*	3,4
CLO-3	3	Design an application using modern human-centered principles.	*Creating*	4,5
CLO-4	4	Implement usability tests for an existing software application	*Applying*	4
CLO-5	5	Recognize the principles & conceptualizing interaction for human-centered software development.	*Understanding*	2
CLO's for Lab				
CLO-6	1-6	Create an interactive design using latest human-centered approaches.	*Creating*	3-6,10

CLO Assessment Mechanism

Assessment Tools	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5	CLO-6
Quizzes	Quiz 1	Quiz 2	Quiz 3	Quiz 4	-	-
Assignments	Assignment 1	Assignment 2	Assignment 3	Assignment 4	-	LAB Assignments
Mid Term Exam	Mid Term Exam	Mid Term Exam	Mid Term Exam	-	-	Lab Mid Term Exam
Final Term Exam	Final Term Exam					Lab Project/ Lab Final Term Exam

Text and Reference Books

Text Book:

1. Interaction Design beyond Human Computer Interaction, Sharp, H Preece, J. Rogers, Wiley, 2019.

Reference Books:

1. Laws of UX: Using Psychology to Design Better Products & Services, Yablonksi, O'Reilly Media, 2020.
2. Designing the User Interface: Strategies for Effective Human-Computer Interaction, Shneiderman, Catherine Plaisant, Pearson, 2018.
3. Designing Interfaces: Patterns for Effective Interaction Design, Tidwell, Brewer, Valencia, O'Reilly

Media, 2019.
4. The Design of Everyday Things: Revised and Expanded Edition, Norman D, Basic Books, 2014.