National University of Sciences & Technology (NUST)
School of Electrical Engineering and Computer Science (SEECS)
Department of Electrical Engineering

Human-Computer Interaction (CS-260)

Course Code:	CS-260	**Semester:**	5th (Fall 2016)
Credit Hours:	3+0	**Prerequisite Codes:**	Fundamentals of ICT (CS-100)
Instructor:	Dr. Mudassar Ahmad Mughal	**Class:**	BE(SE)-5 AB
Office:	B-202, IAEC	**Telephone:**	
Lecture Days:	Monday, Tuesday, Wednesday	**E-mail:**	mudassar.mughal@seecs.edu.pk
Class Room:	TBA	**Consulting Hours:**	Thursday 10am – 12pm
Lab Engineer:	NA	**Lab Engineer Email:**	NA
Knowledge Group:		**Updates on LMS:**	After every lecture

Course Description:

The Association for Computing Machinery (ACM) defines Human-Computer Interaction (HCI) as "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". An important goal of HCI is ensuring user satisfaction while interacting with a computing system. Because HCI studies a human and a computer in communication, the multidisciplinary nature of HCI draws from a number of supporting fields, such as computer graphics, information visualization, programming, psychology, human factors, etc. This course will teach how a human-centered approach could lead to effective human-computer interaction.

Course Objectives:

The main goal of this course is helping the students develop human-centered designing skills. They will learn:

1. The principles and methods to create effective interfaces which bring people joy instead of frustration.
2. Principles of perception and cognition.
3. The benefit of rapid prototyping and comparative evaluation of multiple interface alternatives.
4. How to evaluate the usability, functionality, and acceptability of an interactive system.

Course Learning Outcomes (CLOs):		
At the end of the course the students will be able to:	**PLO**	**BT Level**
1. Outline and discuss the importance of a user-centered design approach.	12	C-1, C-2
2. Collect data and analyze the user needs.	2	C-4
3. Design interfaces that assist the users and their goals.	3	C-5
4. Evaluate a design; and subsequently, redesign by analyzing tradeoffs among multiple alternatives.	4	C-4, C-5, C-6

Program Learning Outcomes

PLO 1: Engineering Knowledge
An ability to apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PLO 2: Problem Analysis
An ability to identify, formulate, research literature, and analyze complex engineering problems reaching

substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PLO 3: Design/Development of Solutions

An ability to design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PLO 4: Investigation

An ability to investigate complex engineering problems in a methodical way including literature survey, design and conduct of experiments, analysis and interpretation of experimental data, and synthesis of information to derive valid conclusions.

PLO 5: Modern Tool Usage

An ability to create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities, with an understanding of the limitations.

PLO 6: The Engineer and Society

An ability to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solution to complex engineering problems.

PLO 7: Environment and Sustainability

An ability to understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.

PLO 8: Ethics

Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PLO 9: Individual and Team Work

An ability to work effectively, as an individual or in a team, on multifaceted and /or multidisciplinary settings.

PLO 10: Communication

An ability to communicate effectively, orally as well as in writing, on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PLO 11: Project Management

An ability to demonstrate management skills and apply engineering principles to one's own work, as a member and/or leader in a team, to manage projects in a multidisciplinary environment.

PLO 12: Lifelong Learning

An ability to recognize importance of, and pursue lifelong learning in the broader context of innovation and technological developments.

Tentative Mapping of CLOs to Assessment Modules and Weightages

To be filled in at the end of the course.

Assessments/CLOs		**CLO1**	**CLO2**	**CLO3**	**CLO4**
Theory (100%)					
Quizzes:	10%				
Assignments:	10%				
OHT-1:	15%				
OHT-2:	15%				
Project:	10%				
End Semester Exam:	40%				

Project description
Students will design and develop a human-cantered prototype following principals of HCI from scratch. Students will propose the project and final deliverable has to be an interactive system. Students are also required to evaluate the prototype and perform further design iterations if needed.

Books:	
Text Book:	1. Alan Dix et al. "Human-Computer Interaction". 2009. Pearson Education.
Reference Books:	1. Helen Sharp et al. “Interaction Design: Beyond Human-Computer Interaction”. 2011 (3rd edition). John Wiley & Sons.

Course Calendar	**Topics**
Week 1	Introduction to HCI?
Week 2	Interaction Design Overview
Week 3	The Human: Perception, Cognition, and Limitations
Week 4	Emotion and Experience
Week 5	Data Gathering: user personae and scenarios
Week 6	**OHT-1**
Week 7	Navigation Design
Week 8	Screen Design
Week 9	Iteration and Prototypes
Week 10	Implementation Support: Windowing Systems
Week 11	Programming the Application
Week 12	**OHT- 2**
Week 13	Software Architecture and General Frameworks
Week 14	Evaluation
Week 15	Studies and Experiments
Week 16	Usability Testing
Week 17	Expert Evaluation
Week 18	**ESE**

Grading Policy:	
Quiz Policy:	The quizzes would be unannounced and normally last for ten minutes. The question framed is to test the concepts involved in last few lectures. Number of quizzes that will be used for evaluation is at the instructor’s discretion; and there will be no ‘best-of’ policy.
Assignment Policy:	In order to develop comprehensive understanding of the subject, assignments will be given. Late assignments will be penalized. All assignments will count towards the total (No ‘best-of’ policy). The students are advised to do the assignment themselves. Copying of assignments is highly discouraged and violations will be dealt with severely by referring any occurrences to the disciplinary committee.
Lab Conduct:	NA
Plagiarism:	SEECS maintains a zero tolerance policy towards plagiarism. While collaboration in this course is highly encouraged, you must ensure that you do not claim other people’s work/ ideas as your own. Plagiarism occurs when the words, ideas, assertions, theories, figures, images, programming codes of others are presented as your own work. You must cite and

	acknowledge all sources of information in your assignments. Failing to comply with the SEECS plagiarism policy will lead to strict penalties including zero marks in assignments and referral to the academic coordination office for disciplinary action.

Tools / Software Requirement:
Will be discussed in the class.