QF01/0408-4.0E	Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Department

Study plan No.	**2021/2022**		**University Specialization**		**Software Engineering**	
Course No.	0114381		**Course name**		Human computer interaction	
Credit Hours	**3**		**Prerequisite Co-requisite**		Systems Analysis and Design	
Course type	☐ MANDATORY UNIVERSITY REQUIREMENT	☐ UNIVERSITY ELECTIVE REQUIREMENTS	☐ FACULTY MANDATORY REQUIREMENT	☐ Support course family requirements	✓ Mandatory requirements	☐ Elective requirements
Teaching style	☐ **Full online learning**		✓ **Blended learning**		☐ **Traditional learning**	
Teaching model	☐ **2Synchronous: 1asynchronous**		✓ **2 face to face : 1synchronous**		☐ **3 Traditional**	

Faculty member and study divisions' information (to be filled in each semester by the subject instructor)

Name	Academic rank	Office No.	Phone No.	E-mail	
Dr.Feras Ahmed Altarawneh	**Assistant professor**	**117**	**325**	**f.altarawneh@zuj.edu.jo**	
Division number	**Time**	**Place**	**Number of students**	**Teaching style**	**Approved model**

Brief description

The Human Computer Interaction (HCI) aims at improving the interactions between users and computers by making computers more usable and receptive to the user's needs. This course is concerned with methodologies and processes for designing interfaces even if they are Software or Hardware Interfaces (i.e., design the best possible interface within given constraints, optimizing for a desired property such as learning ability or efficiency of use), techniques for evaluating and comparing interfaces, developing new interfaces and interaction techniques, and developing descriptive & predictive models & theories of interaction. In addition to the measurements functional and nonfunctional requirements of interactivity in HCI quality for standardization such as flexibility, learnability.

Learning resources

Course book information (Title, author, date of issue, publisher ... etc)	**"**Designing the User Interface: Strategies for Effective Human-Computer Interaction**",** Ben Shneiderman, Catherine Plaisant, Maxine Cohen, Steven Jacobs, Niklas Elmqvist, and Nicholas Diakopoulos**, 2017 (6th Edition) ISBN-10: 0133970779.**
Supportive learning resources (Books, databases, periodicals, software, applications, others)	1. Dix, J. Finlay, G. Abowd, and R. Beale. "Human-Computer Interaction". 3rd edition, 2004 2. J. Preece, Y. Rogers, and H. Sharp. "Interaction Design: Beyond Human-Computer Interaction". 3rd edition, 2011 3. B. Shneiderman, C. Plaisant, M. Cohen, and S. Jacobs. "Designing the User Interface: Strategies for Effective Human-Computer Interaction", 5th edition, 2010
Supporting websites	

QF01/0408-4.0E	Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Department

The physical environment for teaching	✓ Class room	☐ labs	✓ Virtual educational platform	☐ Others
Necessary equipment and software	**Zoom software, e-learning system**			
Supporting people with special needs				
For technical support				

Course learning outcomes (S= *Skills, C= Competences K= Knowledge,)*

No.	Course learning outcomes	The associated program learning output code
	Knowledge	
K1	The knowledge of the different properties of human, and the computer devices & input/outputs channels characteristics based on the interaction theory.	MK1,3
K2	Awareness of the system's interaction theories, methods, techniques, and its applications.	MK3,4,
K3	Understanding of the user interfaces and usability engineering's standards and principles.	MK3, 4,
K4	Understanding the how to evaluate, analyze, design, manage, maintain, and refine the user interface of interactive systems.	MK3,4,
	Skills	
S1	An ability to apply the software interaction models.	MS1, 2, 3
S2	An ability to evaluate and measure the GUI relative to the standards of design.	MS1, 2, 3
S3	An ability to measure the usability relative to the usability engineering principles.	MS1, 3
S4	An ability to apply the ISO usability standards.	MS1,3
	An ability to discuss the designing, implementing, managing, maintaining, training, and refining the user interface of interactive systems, especially mobile devices	MS1,3
	Competences	
C1	An ability to design user interfaces for any kind of systems in diverse application domains.	MC2
C2	An ability to work with diverse team and communicate effectively	MC1
C3	An ability to learn from, and get expertise from different domains.	MC3
C4		

Mechanisms for direct evaluation of learning outcomes

Type of assessment / learning style	Fully electronic learning	Blended learning	Traditional Learning (Theory Learning)	Traditional Learning (Practical Learning)
Midterm exam	30%	30%	**40%**	30%
Participation / practical	0	0	**10%**	30%

applications				
Asynchronous interactive activities	30%	30%	**0**	0
Final exam	40%	40%	**50%**	40%

Note: Asynchronous interactive activities are activities, tasks, projects, assignments, research, studies, projects, work within student groups ... etc, which the student carries out on his own, through the virtual platform without a direct encounter with the subject teacher.

Schedule of simultaneous / face-to-face encounters and their topics

Week	Subject	learning style*	Reference **
1	**The Human** • Input-output channels (visual, auditory, haptic), and Movement • Human memory (sensory, short-term, long-term) • Thinking: reasoning (deduction, Induction, abduction), problem solving,	**Lecture**	776-805
2	• Human Errors, emotion, individual differences, psychology and the design of interactive system.		
3	**The computer** • Main elements of computer devices: text entry, pointing devices, output display devices, virtual reality and 3d interaction	**Lecture**	
4	• Various devices in the physical world (physical controls, sound, smell and haptic feedback, sensors), paper output and input (different types, scanners, optical character recognition) • Memory, processing and networks	**Lecture**	812-827
5	**The Interaction** Models of interaction, Ergonomics Interaction styles, elements of the WIMP interface Interactivity, context of the interaction Experience, engagement and fun	**Lecture**	
6	• Interaction design Basics • What is design? The process of design, user focus, scenarios, navigation design • Screen design and layout	**Lecture**	835-836

	• User action and control, iteration and prototyping		
7	**<u>HCI in the Software process</u>** • The software lifecycle, usability engineering • Iterative design and prototyping, design relational • Design rules	**Lecture**	632-660
8	• Type of design rules, principles to support • usability		
9	• Standards, guidelines, golden rules and heuristics, HCI deign patterns • Implementation support • User interface management systems	**Lecture**	
10	**<u>Evaluation Techniques</u>** • What is evaluation? Goals of evaluation, evaluating • Through expert analysis	**Lecture**	1100-1120
11	• Style of evaluation, experimental evaluation • Query techniques, eye tracking **<u>User support</u>** • Requirements of user support, approaches to user support	**Lecture**	1132-1140
12	• Wizards and assistants • Adaptive help systems • Adaptive help systems, designing users support system	**Lecture**	
13	**<u>Communication and collaboration model</u>** • Face to face communication, conversation, text-based communication, group working	**Lecture**	844-855 861-862
14	• Task decomposition • What is task analysis? • Approaches to task analysis • Task decomposition • Task explanation	**Lecture**	572-585 602-611 618-621
15	Final project discussion	**Lecture**	
16	**Final Exam**		

*** Learning styles: Lecture, flipped learning, learning through projects, learning through problem solving, participatory learning ... etc.**

**** Reference: Pages in a book, database, recorded lecture, content on the e-learning platform, video, website ... etc.**

QF01/0408-4.0E	Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Department

Schedule of asynchronous interactive activities (in the case of e-learning and blended learning)

Week	Task / activity	Reference	Expected results
1	**Writing report** that explain the human characteristics and how they help in designing the system interaction	Book, internet	Report contain the: - Human characteristics - Explanation the relationship with the system interaction
2	**Assignment:** examples from the practices about the human errors, emotions, , individual differences, psychology and the design of interactive system	Internet	Assignment includes an example of: - Human errors - Human emotions - Individual differences psychology
3	**Exercise:** explaining the optical illusions by examples	Internet	- Pictures for optical illusions - explanations
4	**Exercise:** explaining how the process of hearing and the design of the ears helps to design diverse sound devices	Internet	- the parts of the hearing process in the human - list of the sound devices in the computer - mapping between the hearing process in the human and the sound devices in the computer
5	**Assignment:** examples from the real life about each type of thinking process	Internet, practices	- the types of thinking process - Examples with explanation.
6	**Project:** choose a suitable combination of input and output devices to best support the intended interaction and identify how the devices chosen support the users in their tasks. Explain the major problems that the input and output devices solve. Based on (a) Environmental database (b) Word processor for blind people	2.5-p122	- input devices - output devices - Explanation how these devices support the users. -set of problems
7	**Assignment:** Describe Fitts' law (see Chapter 1). How does Fitts' law change for different physical selection devices, such as a three-button mouse, a touchpad, or a pen/stylus? (You'll need to do some research for this.)	2.6- p 122	- Fitts' law - Fitts' law change
8	**Assignment:** Choose two of the interface styles (described in Section 3.5) that you have experience of using. Use the interaction framework to analyze the interaction involved in using these inters face styles for a database selection task. Which of the distances is greatest in each case?	3.1-p 161	- the interface styles - the interaction framework - interaction analysis
9	**Exercise:** What influence does the social environment in which you work have on your interaction with the computer? What effect does the organization (commercial or academic) to which you belong have on the interaction?	3.3-p161	- the social environment - influencing the social environment -the affection of the organization on the interaction
10	**Exercise:** Group the following functions under appropriate headings, assuming that they are to form the basis for a menu-driven word-processing system – the headings you choose will become the menu titles, with the functions appearing under the appropriate one. You can choose as many or as few menu headings as you wish. You may also alter the wordings of the functions slightly if you wish *(save, save as, new, delete, open mail, send mail, quit, undo, table, glossary, preferences,*	3.4-p161	- menu titles with functions

	character style, format paragraph, lay out document, position on page, plain text, bold text, italic text, underline, open file, close file, open copy of file, increase point size, decrease point size, change font, add footnote, cut, copy, paste, clear)		
11	**Assignment:** Describe briefly four different interaction styles used to accommodate the dialog between user and computer	3.7-p 162	- four different interaction styles - explanation these styles used to accommodate the dialog between user and computer
12	**Exercise:** based around a nuclear reactor scenario on the book website at: /e3/scenario/nuclear/ You will need to read the scenario in order to answer the following exercises. Comment on the user of color in the Alarm Control, Emergency Shutdown and Emergency Confirm panels (Figure CS.2 – for figures, see the web scenario). Suggest potential ways of improving the interface to avoid a similar problem recurring.	5.1-p 223	-scenario analysis - set of comments - suggested ways of improving the interface
13	(b) Explain QOC design rationale using an example to illustrate.	6.1-p257	- QOC design rationale - Examples on QOC design rationale
14	**Exercise:** Imagine you have been asked to produce a prototype for the diary system discussed in the worked exercise in Section 7.2.3. What would be an appropriate prototyping approach to enable you to test the design using the usability metrics specified, and why?	6.2-p 257	- usability metrics - explanation appropriate prototyping approach
15	**Assignment:** Find as much information as you can on ISO standards that relate to usability. (Hint: Many stan dards are discussed in terms of ergonomics.) How many different standards and draft standards can you find?	7.3-p287	- usability characteristic - ISO standards
16	**Exercise:** It has been suggested in this chapter that consistency could be considered a major category of interactive principles, on the same level as learnability, flexibility and robustness. If this was the case, which principles discussed in this chapter would appear in support of consistency?	7.2 –p287	-consistency characteristic - set of principles support consistency