ACCRA INSTITUTE OF TECHNOLOGY

The University of the Future

END OF SEMESTER EXAMINATIONS

1ST SEMESTER 2021/2022 ACADEMIC YEAR

DATE: DECEMBER 2021

COURSE CODE: IT403/CS408

COURSE TITLE: HUMAN COMPUTER INTERACTION

LECTURER'S NAME: EMMANUEL ADOTEY PAPPOE

DURATION: 3HOURS

COURSE OUTLINE (MAIN TOPICS)	
MajorTopic-1	Introduction to Human Computer Interaction
MajorTopic-2	Human Factor: Physical
MajorTopic-3	Human Factor: Mental
MajorTopic-4	Social Aspect of HCI
MajorTopic-5	Input Technology
MajorTopic-6	Output Technology
MajorTopic-7	Conceptual Models
MajorTopic-8	User-Centered Design
MajorTopic-9	System and User Requirement Analysis
MajorTopic-10	Prototype Development

PART A

FOUR QUESTIONS ANSWER THREE

Question 1

a) Prototypes are useful tools for designers to discuss their ideas with stakeholders. It becomes a communication medium between the systems developers and is very suitable and effective to be used by developers as a test platform for their ideas. For example, if the designer is trying to identify methods in which the users would implement a set of tasks, and to determine if the tools developed would be able to support these tasks, the prototype development should be paper based. Explain with at least one example, the **three (3)** main importance of prototype development.

Major Topic 10 **- Prototype Development**	**AP**	**7**

b) The main goal of the Human-Computer Interaction is to produce a system that is easy and safe to use, apart from being able to function well. This computer system should not just be easily usable, but also easily assembled, studied and maintained. Discuss stating at least, one example of the usability goals**.**

Major Topic 1 **- Introduction To Human Computer Interaction**	**AN**	**7**

c) Discuss the two types of mental models that users employ when interacting with devices

Major Topic 3	**EV**	**6**

- Mental factor		

TOTAL SCORE: 20

Question 2

a) Based on the User-Centered Life Cycle Model, **differentiate with practical examples**, the difference between The Simple Model and the Usability-Engineering Model.

Major Topic 7 **– User Centered Design**	**AP**	**7**

b) After the gathering of data from stakeholders, the data is interpreted and analysed. There are many different techniques that can be used to interpret and analyse the data that have been gathered, depending on the requirements. Differentiate between the three techniques that can be used in understanding users and their tasks.

Major Topic 9 **- System and User Requirement Analysis**	**AN**	**7**

c) Examples of sounds are voices in conversation and music. Too much sound would only serve as a disturbance to users. Explain briefly **five (5)** applications that are suited to use sounds as a form of reactive response

Major Topic 2: **physical Aspect of HCI**	**AP**	**6**

TOTAL SCORE: 20

Question 3

a) An effective conceptual model can be utilized by users to understand the characteristics and abilities of a system and ensure appropriate user interaction with a system. Explain the two categories of the conceptual model

Major Topic 7 **- Conceptual Models**	**AN**	**7**

b) The utilization of voice or conversational sound has long been of interest to system designers. Discuss the two methods that are used to produce conversational sounds.

Major Topic 6 **– Output Technology**	**AP**	**7**

c) The success of the system depends on the depth of difficulty experienced by users to study and use the system. The assumption is that users are able to learn everything from documentations and guidance books. However, in reality not many users refer to these guidebooks or documents. Briefly explain the problems faced by users in the process of learning a new system

Major Topi 4 **- Human Factor Social**	**AN**	**6**

TOTAL SCORE:20

Question 4

a) The research goal of the human-computer interaction is to produce a system that can be easily use and is secure. It will be able to increase global productivity and the security of an organisation. Explain with an example, how this can be achieved

Major Topic 1 **– Introduction to HCI**	**AN**	**7**

b) There are many types of prototypes that can be developed for the purpose of evaluation, and the prototype that is most suitable depends on its purpose and when it was developed. Prototypes can also be classified based on accuracy and resemblance to the final product. High-fidelity prototypes utilise materials that are used in the final products. Thus, they have similar characteristics with the final product. However, this technique has a number of weaknesses that causes researchers to discourage its usage. Discuss four reasons why **you** as a HCI student will not use the Hight Fidelity Prototype in your development of a website for your client.

Major Topic 10 **– Prototype Development**	**AP**	**7**

c) In the human memory, knowledge is arranged in a systematic and structured manner. Discuss the three forms of knowledge representation.

Major Topic 3 **Mental Aspect of HCI**	**AP**	**6**

TOTAL SCORE: 20

PART B

TWO QUESTIONS ANSWER ALL

Question 1

a) The rationale of the Participatory design approach is that, system users are assumed experts in the context of the job, and any design is most effective if these experts are allowed to contribute towards the designing of the prospective system. **Explain** the three specific characteristics of this approach

Major Topic 8 **-User Centered Design**	**EV**	**7**

b) It is not easy to determine what is required by users. Developers will not be able to obtain this information by merely asking users 'what do you need?'. This is because users are usually unaware of the capabilities of the system. On the contrary, to gather the necessary information, developers need to understand and address some four critical issues form the user/stakeholder's perspective. Elaborate on these issues.

Major Topic 9 **-System and User requirement Analysis**	**CR**	**7**

c) When designing an interface, graphical representation is used to represent real objects on the computer display. These representations help users in developing expectations and understanding the functions of the representation. Briefly explain the characteristics of a good interface design

Major Topic 2 - human Factor, Physical	EV	6

TOTAL SCORE: 20

Question 2

a) A conceptual model provides users with a brief and simple explanation about the proposed system in the form of ideas and concepts related to the abilities and characteristics of the system. Explain how Object-Oriented Model and the Interface Model are implemented under conceptual model

Major Topic 7 - Conceptual Model	EV	7

b) One of the most important goals of designing an interactive system is to optimise the interaction between users and the products created. Thus, the end product should always support the requirements and needs of its users, as well as always be able to provide all the necessary features that would speed up and improvise the users' tasks. Developers should be able to identify individuals whom they could refer to in order to obtain information on the system and user requirements. Explain the five types of requirements that are used to obtain the necessary information during system development.

Major Topic 9 -System and User requirement Analysis	CR	7

c) When designing a system to support group communication in an organisation, there is a number of issues that need to be taken into consideration. Explain five of these considerations

Major Topic 2 **Social Aspect of HCI**	**CR**	**6**

TOTAL SCORE: 20