

TECHNOLOGICAL UNIVERSITY DUBLIN

Grangegorman

**TU856 – BSc. (Honours) in Computer Science
TU857 – BSc. (Honours) in Computer Science
(Infrastructure)**

Year 2

SEMESTER 2 EXAMINATIONS 2022/23

CMPU2008 Human Computer Interaction

Internal Examiners:

Dr. Emma Murphy and Dr. Art Sloan
Dr. Paul Doyle

External Examiners:

Ms. Sanita Tifentale
Dr. Charles Markham

Instructions To Candidates:

Answer QUESTION 1 and ANY TWO questions of the remaining three available.

Question 1 carries 40 marks while Questions (2), (3), and (4) each carry 30 marks

Exam Duration: Two Hours

1.

NOTE: This question is compulsory

- (a)** What is the difference between *human-centred design* and *technology-driven design*?
(4 marks)
- (b)** Explain how the principles of empathy and iteration are central to human centred design.
(5 marks)
- (c)** Define a user *task* and a user *goal* and explain, using an example, the relationship between them.
(6 marks)
- (d)** You are running an in-person interview study with 20 users to understand their perceptions and experiences of using an online banking application. The bank has given a list of questions, but as they are not experienced in user research they are not written in an appropriate format for user interviews. For each of the questions below highlight the issues with the interview question and rewrite the question to improve it.
- i. ‘Do you find the log-in screen confusing?’
 - ii. ‘Does the large font make the text easy to read?’
 - iii. ‘How can we redesign our banking app to address your motivations, goals and overcome your pain points?’
 - iv. ‘How probable would it be for you use the help button?’
 - v. ‘When did you last use the banking app?’
- (10 marks)
- (e)** You have been asked to conduct a user study to understand accessibility issues and barriers that current users are experiencing with the Dublin Bus mobile app. The study must be conducted within one month and you have a limited budget to cover travel costs for participants.
Referring to the details provided describe how you will run your study using at least two types of user research outlining:
- why you chose each method for the study,
 - your recruitment strategy for each method.
 - Outline any ethical considerations for collecting data for each method.
 - Describe the practical measures you will take to record the data for each method.
 - Describe the type of data you will collect for each method.
- (15 marks)

2. (a) What is a storyboard and how are they useful for user interface design?

(4 marks)

- (b)** Briefly explain each of the following terms:
- i. Prototyping
 - ii. High-fidelity prototype
 - iii. Low-fidelity prototype

(6 marks)

(c) What is task analysis and why is it important for user interface design? Also, name two types of Task Analysis. (8 marks)

(d) What is participatory design and what are the advantages of using it for the design of user interfaces to technology? (12 marks)

3. (a) Define and describe the term, ‘usability’. (3 marks)

(b) What is Web Accessibility? (3 marks)

(c) Choose **three** of the following groups of users and, for **each** of them, outline **three** ways that we can make websites more accessible for them.

- Visually Impaired Users
- Users with Mobile and Dexterity issues
- Users with Cognitive Impairment
- Users with Hearing Impairment

(9 marks)

(d) List Nielsen's Heuristics, and explain how can they be applied in user interface design. (15 marks)

4. (a) What is the difference between a *discretionary* and *non-discretionary* user of an interface? (4 marks)

(b) How might ‘Novice Users’ be compared to ‘Expert Users’? (4 marks)

(c) List and explain the four out of the five Gestalt Laws of perceptual organisation and for each law give an example of how it could be applied in screen design? (12 marks)

(d) How can users develop Mental Models, and why are they important for user interface design? (10 marks)