NUI Galway
OÉ Gaillimh

Semester I Examinations 2021/ 2022

Exam Code(s)	3BA1; 4BA1; 3BCT121
Exam(s)	B.A. B.Sc. in Computer Science and Information Technology
Module Code(s)	CT318
Module(s)	Human Computer Interaction
Paper No. Repeat Paper	1
External Examiner(s) Internal Examiner(s)	Prof. Pier Luca Lanzi Professor Michael Madden Ms. Karen Young*
Instructions:	Candidates should answer **Question 1** and **any two other** questions. All questions carry equal marks.
Duration	2 Hours
No. of Pages	3
Discipline(s):	Computer Science

Requirements:

Release in Exam Venue	Yes	X	No	
MCQ	Yes		No	X
Handout	None			
Statistical/ Log Tables	None			
Cambridge Tables	None			
Graph Paper	None			
Log Graph Paper	None			
Other Materials	None			
Graphic material in colour	Yes		No	x

PTO

Q.1 You are working in a global software development organisation with colleagues in New York, Los Angeles, London, Mumbai, Hong Kong, and Sydney. International teams in your company often collaborate on large projects, from requirements specification through conceptual and physical designs and prototypes to full implementations. You have been asked to work with a small team to create an ideal online tool set that would enable you to collaborate effectively during software development activities. They are particularly concerned initially with supporting the early requirements analysis activities and sharing of system models and designs.

Your company has indicated that they want an initial, early design submission from you to include the following:

(a) A PACT analysis for this application.

(6)

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

(9)

(c) An initial evaluation plan for the system which will support comprehensive testing of your design. This should clearly outline **what** activities will be evaluated, as well as **when** the evaluations will take place, **how** (what techniques) they will be conducted and **who** will undertake them.

(5)

Q.2 (a) *There is no "right" design, just good and bad designs.*

Discuss the contribution of **Design Thinking** in all its stages to achieving good design outcomes, using examples from your module study and projects, to illustrate your answer.

(8)

(b) You have been tasked with developing a mobile application for a new *music streaming service***.** Outline the progression from **Conceptual** to **Physical** Design in this context, clearly identifying the inputs and outputs for each design phase.

(7)

(c) The choice of **interaction style** is one of the most important decisions in interaction design.

(i) Why is this and what factors should be considered in making this choice?

(3)

(ii) What interaction style would you recommend for a tourist information kiosk and why?

(2)

Q.3 (a) Successful HCI is heavily dependent on evaluation. Prepare an **outline evaluation plan** for the design of a new *mobile banking app*. This plan should clearly address users' goals and identify each of the steps involved in the evaluation identifying when, how, what and by whom the evaluation activities will be undertaken.

(8)

(b) Effective **icon design** is challenging. What do you think makes the design of simple memorable icons so difficult? Use illustrative examples to support your answer.

(4)

(c) The importance of **information visualisations** in successful interaction designs is well recognised, however simply making information available in visual form does not contribute to improved understanding of that information. What factors are important to enabling users make sense of the information presented? How would you apply these factors in the design of a *new healthy lifestyle / wellbeing app*?

(8)

Q.4 (a) Effective interaction design is ultimately about the effective assignment of responsibilities to the parties participating in the interaction, i.e. the human and the computer.

(i) From your study of the various **theories**, **models**, **processes**, and **techniques** of interaction design, comment on the validity of the above statement.

(6)

(ii) Discuss issues of the allocation of functions between people and software specifically in the context of *fitness monitoring and assessment* apps.

(4)

(b) Elaborate the role of **prototyping** (both low and high fidelity) in improving the interaction experience of users using technology. Your answer should give consideration of **what** is prototyped and **when** during the design of an interactive experience, use examples from your group project to illustrate your answer.

(6)

(c) Comment on the relative merits of **Empathy mapping** and **User personas** as means of representing user research, illustrating your answer with examples as appropriate.

(4)

Semester I Examinations 2019/ 2020

Exam Code(s)	3BCT121; 3BA1; 4BA1
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Graph Paper	None			
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Other Materials	None			
Graphic material in colour	Yes		No	x

PTO

Q.1 You are working as part of a team developing a new ***health tracking / monitoring application***. This application will cover both physical (e.g. activity and exercise tracking) and mental (e.g. mood, sleep etc.) health measures. The application is initially targeted at a teenage and young adult population and discussions are under way to link it with the health curriculum in second level schools. Linking use of the app to health benefits is a critical aspect of its design. Given this target audience the user experience is critical to ensure engagement and ongoing use.

Your company has indicated that they want an initial, early design submission from you to include the following:

(a) A PACT analysis for this application.

(6)

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

(9)

(c) An initial evaluation plan for the system which will support comprehensive testing of your design. This should clearly outline **what** activities will be evaluated, as well as **when** the evaluations will take place, **how** (what techniques) they will be conducted and **who** will undertake them.

(5)

Q.2 (a) "*The best way to have a good idea is to have lots of ideas*" (Linus Pauling)

Elaborate on the role of **prototyping** in improving the design of interactions for users of technology devices. Your answer should give consideration of **what** is prototyped and **when,** during the design of an interactive experience.

(8)

(b) You have been tasked with developing a website / mobile application for a new gym. Outline the progression from **Conceptual** to **Physical** Design in this context, clearly identifying the inputs and outputs for each design phase.

(8)

(c) What are **mental models**? How can a knowledge of these be used effectively during interaction design?

(4)

Q.3 (a) The choice of **interaction style** is one of the most important decisions in interaction design. What factors should be considered in making this choice? Use examples to illustrate your answer.

(4)

(b) Voice-first user experiences are now ubiquitous with smart speaker sales and usage on the rise. Older adults are identified as a particular target audience to benefit from the use of voice assistants. However, a large percentage of users still find the experience of talking to voice assistants unnatural. What general design guidelines can be applied to make voice experiences better? And are there specific guidelines for older adults?

(6)

(c) "*A picture speaks a thousand words*", the importance of **visualisation** in successful interaction designs is well recognised. What are the relevant criteria to consider in incorporating effective visualisations into mobile applications?

(5)

(d) In designing interactive applications there are many **guidelines** available to help the designer. Discuss the type and role of guidelines in producing good interactive system designs.

(5)

Q.4 (a) Effective interaction design is ultimately about the correct assignment of responsibilities to the parties participating in the interaction, i.e. the human and the computer.

(i) From your study of the various **theories**, **models**, **processes**, and **techniques** of interaction design, comment on the validity of the above statement.

(6)

(ii) Discuss issues of the allocation of functions between people and software specifically in the context of a ***language learning*** system for mobile devices.

(4)

(b) You have been tasked with undertaking a redesign of the university's website. Prepare an outline **evaluation plan** for this project clearly outlining the goals and activities (when, how and by whom the evaluation activities will be undertaken, for the system) involved in the evaluation.

(6)

(c) Comment on the role of **colour** in designing good user experiences.

(4)

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Autumn Examinations 2018 / 2019

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Module Code(s)	CT318
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Paper No. Repeat Paper	1
External Examiner(s) Internal Examiner(s)	Dr Jacob Howe Prof Michael Madden Dr. Heike Vornhagen* Ms. Karen Young
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Release in Exam Venue

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Other Materials	None
Graphic material in colour	None

PTO

Q.1

You have been asked to design an interactive web-based system for an airport food hall.

The system must support the user in browsing, ordering and payment. Payment for different vendors within the one order are processed separately for each vendor, but together as one bill for the customer. Users can order in advance, i.e. before travelling, or before disembarking from plane, and notify the system of an expected collection time.

Your client has stressed the importance of an effective, easy to use, and well-organised interface for their users, given the time pressures customers face.

The company has indicated that they want an initial design submission from you to include the following:

(a) A PACT analysis for this application. (7)

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles). (7)

(c) An evaluation plan, clearly outlining what activities will be evaluated, when, how and by whom the evaluation activities will be undertaken, and how this may influence future designs. (6)

Q.2

(a) What makes something easy to use? What are the properties of an interactive system that make it easy to use? Modify your list to make it specific to an ageing population. (5)

(b) A liberal newspaper has asked you to provide visualisations for their upcoming article on Climate Change in Ireland. Develop a briefing to include goals and overall outline of this project, including at least three sketches. (10)

(c) Explain why interactivity is an important consideration in digital interface design. Describe what would influence your choices. (5)

PTO

Q.3

(a) "*Perfection is attained not when there is no longer anything to add, but when there is no longer anything to take away*" (Antoine de Saint Exupery, 1954)
Analyse the above statement in light of your study of effective **visual design**, including consideration of its application to a **website of your choice** in your answer. (10)

(b) You have been asked to design a remote control device that can be used to control the lighting, heating, curtains/blinds in the lecture theatres and classrooms on the NUI, Galway campus. Prepare a prototype design, outlining the user considerations you found relevant in solving this problem. (6)

(c) In designing an interactive application there are many guidelines available to help the designer. Discuss the type and role of guidelines in producing good interactive web-based systems. (4)

Q.4
(a) You have been tasked with undertaking a redesign of the website of the airline Aer Lingus.
Identify different categories of users and describe which data gathering techniques you would use to collect information about their respective needs. (6)

(b) You have been asked to design an interactive web-based ***maths learning environment*** for children to support their development of effective maths skills. The system must be appealing and fun to use, engage the children, and enable navigation by a variety of means (e.g. by topic, or through sequential lessons, or by activity). Pick two interface types which would best support this and describe their key features. (8)

(c) Which interaction style would you apply to the design of each of the following and why?

- A mobile Diabetes Monitoring Device
- A Galway Events Ticketing Machine
- A Diary Management System for Mobile and Desktop Use (6)

END

NUI Galway
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Semester I Examinations 2018 / 2019

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External Examiner(s) **Internal Examiner (s)**	**Professor Jacob Howe** **Professor Michael Madden** **Dr. Heike Vornhagen** **Ms. Karen Young**
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Release in Exam Venue

MCQ

Handout	None
Statistical/ Log Tables	None
Cambridge Tables	None
Graph Paper	None
Log Graph Paper	None
Other Materials	None
Graphic material in colour	None

PTO

Q.1

You have been asked to design an interface for Galway City Council that will enable people living in Galway to access information about the city. The interface must be easy to use and enable navigation by a variety of means (e.g. by topic, by department, etc.).

The application must also store the users' details, greet them when they enter, store a record of their previous visits, and recommend areas for further attention.

The company has indicated that they want an initial design submission from you to include the following:

(a) A PACT analysis for this application. (7)

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles). (7)

(c) An evaluation plan, clearly outlining what activities will be evaluated, when, how and by whom the evaluation activities will be undertaken, and how this may influence future designs. (6)

Q.2

(a) List and briefly explain the 5 core principles of Design (5)

(b) A UK right-wing online newspaper has asked you to develop a series of interactive visualisations about the UK leaving the EU (Brexit). Develop a briefing to include goals and overall outline of this project, including at least three sketches. (10)

(c) Explain why colour is an important consideration in digital interface design. Describe what would influence your choices. (5)

PTO

Q3

(a) “What about confusing clutter? Information overload? Doesn't data have to be "boiled down" and "simplified"? These common questions miss the point, for the quantity of detail is an issue completely separate from the difficulty of reading. *Clutter and confusion are failures of design, not attributes of information*.” – Edward Tufte.

Analyse the above statement in light of your study of effective visual design, including consideration of its application to a website of choice in your answer. (10)

(b) You have been asked to design an interactive kiosk for a local bike share. Prepare a prototype design, outlining the user considerations you found relevant in solving this problem. (6)

(c) What makes something easy to use? What are the properties of an interactive system that make it easy to use for the elderly? For people with a visual disability? For children? (4)

Q.4

(a) You have been tasked with undertaking a redesign of the streaming website Netflix. (6)
Identify different categories of users and describe which data gathering techniques you would use to collect information about their respective needs.

(b) You have been asked to design a *music learning environment* for children to support their development of effective music skills. Pick two interface types which would best support this and describe their key features. (8)

(c) Which interaction style would you apply to the design of each of the following and why? (6)

- A fitness tracker.
- A self-service checkout system in a supermarket.
- A language learning mobile application.

END

NUI Galway
OÉ Gaillimh

Autumn Examinations 2017/ 2018

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External Examiner(s) Internal Examiner(s)	Professor Jacob Howe Prof. Michael Madden Ms. Karen Young*
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Duration	2 Hours
No. of Pages	3

Requirements:

Release in Exam Venue	Yes	X	No	
MCQ	Yes		No	X
Handout	None			
Statistical/ Log Tables	None			
Cambridge Tables	None			
Graph Paper	None			
Log Graph Paper	None			
Other Materials	None			
Graphic material in colour	Yes		No	x

Q.1 You have been asked to contribute to the design of a **new mobile application** to enable users to manage and organise their **travel plans** or commitments easily in advance of any trips. This application will enable users to schedule their travel arrangements by preferred day, time, and cost (comparing train, bus, taxi, air & boat), select accommodation by cost and location, view and select events of interest during their visit as well as select restaurants or bars, shopping locations etc. while there. Your company is open to other functional possibilities including automatic logging of expenses / costs and other time saving factors for users.

Your company has indicated that they want an initial, early design submission from you to include the following:

(a) A PACT analysis for this application.

(6)

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

(9)

(c) An evaluation plan for the system which will support comprehensive testing of your design, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken.

(5)

Q. 2. (a) Design principles are intended to cover all interactive systems. Their generalisability is both their strength and weakness. Discuss the role of design principles in developing good interactive systems, illustrating your response with examples as appropriate. In your answer consider the use of these principles in all designs: how important is **context** in the application of these principles?

(9)

(b) What makes something easy to use? What are the properties of an interactive system that make it easy to use for the elderly? And for children?

(5)

(c) Your company has commissioned a number of evaluation studies which have shown that your users find your software products consistently "difficult to use". Write a short **memo** to your colleagues in your company on the importance of **mental models** to the success of the interactive systems designed by your company .

(6)

Q. 3. (a) Effective interaction design involves achieving a balance between ***divergent*** and ***convergent*** design thinking.

(i) Compare these two thought processes, explaining the design stages each are suited to, and the importance of each to a successful design outcome using examples to illustrate your answer.

(5)

(ii) **Laseau's** Design Funnel clearly integrates these two processes. Using this funnel elaborate on the different activities involved during the elaboration and reduction design phases for the travel management mobile application described in Q.1 above.

(5)

(b) Choose an appropriate **evaluation strategy** for each of the following situations. In each case identify: the participants, the technique to be used, and the representative tasks to be examined.

(i) You are designing a new on-line shopping and home delivery system for a new supermarket chain.
(ii) You have been asked to design a high-tech interactive refrigerator which will alert users when they need to purchase stock, when stock is out of date and analyse overall efficiency of energy usage.
(iii) You are tasked with designing a new interactive game application for mobile phones.

(6)

(c) Given that good design is dependent on good designers, not expensive tools, comment on the role of **software tools** in interaction design. Support your answer with relevant examples.

(4)

Q.4 (a) Since the advent of the Graphical User Interface (GUI), User Interface design has been overly reliant on vision as a means of communicating with users. Discuss the advantages and disadvantages of augmenting the User Interface with (a) **sound** and (b) **haptics**, illustrating your answer with specific examples.

(7)

(b) Explain Norman's *gulf of execution* and *gulf of evaluation* as they relate to successful interaction design, using appropriate examples.

(4)

(c) The choice of **interaction style** is one of the most importance decisions in Interaction Design. What factors should be considered in making this choice? Use examples to illustrate your answer.

(3)

(d) Which **interaction style** would you apply to the design of each of the following and why?

- A blood glucose Monitoring Device.
- A high-tech interactive refrigerator which will alert users when they need to purchase stock, when stock is out of date and analyse overall efficiency of energy usage.
- A mobile scheduling application for an international design consultancy.

(6)

NUI Galway
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Semester I Examinations 2017/ 2018

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External Examiner(s) Internal Examiner(s)	Professor Jacob Howe Dr. Michael Schukat Ms. Karen Young*
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Handout	None			
Statistical/ Log Tables	None			
Cambridge Tables	None			
Graph Paper	None			
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Other Materials	None			
Graphic material in colour	Yes		No	x

Q.1 You are based in New York and are working on a global software engineering team. You work with colleagues in Los Angeles, London, Mumbai, Hong Kong, and Sydney and often collaborate on large projects, from requirements specification through conceptual and physical designs and prototypes to full implementations. You have been asked to work with a small team to create an ideal online tool set that would enable you to collaborate effectively during software development activities. They are particularly concerned initially with supporting the early requirements analysis activities and sharing of system models and designs.

Your company has indicated that they want an initial, early design submission from you to include the following:

(a) A PACT analysis for this application.

(6)

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

(9)

(c) An evaluation plan, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken, for the system which will support comprehensive testing of your design.

(5)

Q.2 (a) *There is no "right" design, just good and bad designs.*

Discuss the role of design principles in supporting the development of good interactive systems, illustrating your response with examples as appropriate.

(8)

(b) You have been tasked with undertaking a redesign of the university's website. Prepare an outline **evaluation plan** for this project clearly outlining the goals and activities (when, how and by whom the evaluation activities will be undertaken, for the system) involved in the evaluation.

(7)

(c) Effective **error messages** are critical to good user interaction design. What is the purpose of error messages? What factors are important in their design? Design an appropriate error message for a user who is unsuccessfully trying to gain access to a service they do not currently have clearance to access.

(5)

Q.3 (a) Research in interaction design has identified two distinct approaches to the cooperative interaction between human and computing agents: the **human centred** and **machine centred** views. Norman characterises the differences in these approaches as those between analogue and digital agents. What are the implications of this for effective interaction design?

(8)

(b) You have been tasked with developing a website and mobile application for **a chain of bookstores**. Outline the progression from **Conceptual** to **Physical** Design in this context, clearly identifying the inputs and outputs for each design phase.

(6)

(c) Write a one-page memo to your colleagues in your software design company, advocating the requirement to incorporate **physiological data** collection in all interactive product **evaluations** from a future date.

(6)

Q.4 (a) You have been asked to design a ***remote control*** device that can be used to control the variety of heating and lighting mechanisms in a new block of apartments. Prepare a prototype design, outlining the **user considerations** you found relevant in solving this problem.

(8)

(b) Elaborate the role of **prototyping** (both low and high fidelity) in improving the interaction experience of users using technology. Your answer should give consideration of **what** is prototyped and **when** during the design of an interactive experience.

(6)

(c) Which **interaction style** would you apply to the design of each of the following and why?

- A blood pressure monitoring device.
- A self-service petrol dispensing and payment system.
- A language learning mobile application.

(6)

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Autumn Examinations 2016/ 2017

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Duration	2 hours
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Requirements: None	Release to Library: Yes ☐ No ☐

Q.1 You have been asked to design an application for recording and analysing match scores suitable for many different sporting environments. The initial brief requires the application to be developed to record scores (from play and frees), frees, substitutions, yellow and red cards in GAA matches. The mobile phone is the likely device of choice for this application given the use context. The system must be easy to use, and enable quick data entry, as well as ease of data transfer or comparative analysis of statistics across matches, teams etc.

This system will be competing against a variety of other applications in appstores and so must be very well designed to appeal to its audience.

The company has indicated that they want an initial design submission from you to include the following:

(a) A PACT analysis for this application.

(6)

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

(9)

(c) An evaluation plan for the system which will support comprehensive testing of your design, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken.

(5)

Q. 2. (a) Interaction Design is concerned with the design of digital devices to meet the *physical*, *emotional* and *intellectual* needs of the people using these devices. Analyse the contribution of the **models** and **frameworks** covered in this course to meeting this design goal throughout all stages of the Systems Development Lifecycle (SDLC).

(10)

(b) Effective **error messages** are critical to good user interaction design. What is the purpose of error messages? What factors are important in their design? Design an appropriate error message for a user who is unsuccessfully trying to gain access to a service they do not currently have clearance to access.

(5)

(c) Given that good design is dependent on good designers, not expensive tools, comment on the role of **software tools** in interaction design. Support your answer with relevant examples.

(5)

Q. 3. (a) "*Perfection is attained not when there is no longer anything to add, but when there is no longer anything to take away*" (Antoine de Saint Exupery, 1954)

Analyse the above statement in light of your study of effective **visual design**, including consideration of its application to a ***website of your choice*** in your answer.

(8)

(b) Which interaction style would you apply to the design of each of the following and why?

- A home energy-consumption monitor.
- A travel plan management system with both a mobile and web interface.
- An online stock trade tracking application with graphical visual output.

(6)

(c) Effective interaction design involves achieving a balance between *divergent* and *convergent* design thinking. *Laseau's* Design Funnel clearly integrates these two processes. Using this funnel elaborate on the different activities involved during the elaboration and reduction design phases for the ***mobile sporting*** application described in Q.1 above.

(6)

Q.4 (a) Effective interaction design is ultimately about the correct assignment of responsibilities to the parties participating in the interaction, i.e. the human and the computer.

(i) From your study of the various theories, models, processes, and techniques of interaction design, comment on the validity of the above statement.

(6)

(ii) Discuss issues of the allocation of functions between people and software specifically in the context of a ***blood glucose monitoring*** system for diabetics.

(4)

(b) You have been asked to design a *remote control* device that can be used to control the lighting, heating, curtains/blinds for both domestic and public settings. Prepare a prototype design, outlining the *user considerations* you found relevant in solving this problem.

(6)

(c) Explain Norman's *gulf of execution* and *gulf of evaluation* as they relate to successful interaction design, using appropriate examples.

(4)

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Semester I Examinations 2016/ 2017

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Q.1 You have been asked to design an interactive mobile ***music learning environment*** for children to support their development of effective music skills. The system must be appealing and fun to use, engage the children, and enable navigation by a variety of means (e.g. by topic, or through sequential lessons, or by activity).

The application must also store the children's details, greet them when they enter, store a record of their performance on various games and tasks, and recommend areas for further attention.

The company has indicated that they want an initial design submission from you to include the following:

(a) A PACT analysis for this application.

(6)

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

(9)

(c) An evaluation plan for the system which will support comprehensive testing of your design, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken.

(5)

Q. 2. (a) Design principles are intended to cover all interactive systems. Their generalisability is both their strength and weakness. Discuss the role of design principles in developing good interactive systems, illustrating your response with examples as appropriate. In your answer consider the use of these principles in all designs: how important is context in the application of these principles?

(10)

(b) Since the advent of the Graphical User Interface (GUI), User Interface design has been overly reliant on vision as a means of communicating with users. Discuss the advantages and disadvantages of augmenting the User Interface with (a) **sound** and (b) **haptics**, illustrating your answer with specific examples.

(6)

(c) Comment on the effective use of **metaphor** in interaction design, supporting your answer with examples as appropriate.

(4)

Q.3 (a) Develop a **storyboard** showing the proposed use of a *SmartHome* "butler" service designed to support its user in the administration of their domestic environment (heat, lighting, groceries, laundry, electricity consumption, entertainment, maintenance activities, etc.). Comment on the efficacy of your proposed approach, the balance between automation and user control and its potential application.

(8)

(b) Successful HCI is heavily dependent on ***evaluation***. You are keen to propose a more rigorous evaluation methodology for your organisation. Prepare a **memo** outlining the shortcomings of the traditional evaluation techniques deployed by your organisation (usability lab testing of prototype and final designs), and proposing the benefits of this new evaluation approach (including successful examples of its application in other contexts) to be presented to your company's management team.

(6)

(c) Effective interaction design involves achieving a balance between *divergent* and *convergent* design thinking. *Laseau's* Design Funnel clearly integrates these two processes. Using this funnel elaborate on the different activities involved during the elaboration and reduction design phases for the ***Music Learning*** mobile application described in Q.1 above.

(6)

Q.4 (a) Effective interaction design is ultimately about the correct assignment of responsibilities to the parties participating in the interaction, i.e. the human and the computer.

(i) From your study of the various theories, models, processes, and techniques of interaction design, comment on the validity of the above statement.

(6)

(ii) Discuss issues of the allocation of functions between people and software specifically in the context of a ***Time Management*** system for professionals.

(4)

(b) You have been tasked with developing **a mobile shopping app** (application). Outline the progression from Conceptual to Physical Design in this context, clearly identifying the inputs and outputs for each design phase.

(6)

(c) Elaborate the role of **prototyping** (both low and high fidelity) in improving the interaction experience of users using technology, illustrating your answer with examples when appropriate.

(4)

NUI Galway
OÉ Gaillimh

Autumn Examinations 2015/ 2016

Exam Code(s)	3BCT121; 3BA1; 4BA1
Exam(s)	B.Sc. in Computer Science and Information Technology B.A.
Module Code(s)	CT318
Module(s)	Human Computer Interaction
Paper No. Repeat Paper	1
External Examiner(s) Internal Examiner(s)	Professor Liam Maguire Prof. Gerard Lyons Dr. Jim Duggan Ms. Karen Young
Instructions:	Candidates should answer **Question 1** and **any two other** questions. All questions carry equal marks.
Duration	2 hours
No. of Pages	3
Requirements: None	Release to Library: Yes ☐ No

Q.1 You have been asked to design an interactive system (website, mobile application) to support the city's *Arts Festival*. The system should provide information on all Arts Festival events: date, location, producer, performers, reviews etc. In addition, the system must support ticket bookings and payments, as well as providing interactive demos and snippets from the performances and opportunities to get involved in the interactive digital performances or post reviews or play "games" associated with the festival.

The commissioning company has indicated that they want an initial design submission from you to include the following:

(a) A PACT analysis for this application.

[6]

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

[9]

(c) An evaluation plan, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken, for the system which will support comprehensive testing of your design.

[5]

Q. 2. (a) Good design requires good designers, not expensive tools.

(i) From your study of the various theories, models, processes, and techniques of interaction design, comment on the validity of the above statement.

[5]

(ii) What are the implications of your analysis in (i) above for interaction design education? Propose a course outline for a one-semester course in Interaction Design based on your analysis.

[7]

(b) Effective **error messages** are critical to good user interaction design. What is the purpose of error messages? What factors are important in their design? Design an appropriate error message for a user who is unsuccessfully trying to gain access to a service they do not currently have clearance to access.

[4]

(c) Comment on the role and efficacy of User Interface *design guidelines* in supporting interactive system design.

[4]

Q. 3. (a) (i) Distinguish between a *conceptual* model and a *physical* model in design.

(ii) You have been tasked with developing a new language learning environment for adult language learners. Using *Verplank's Interaction Design Framework*, what are the key elements you will need to capture and represent in your conceptual model?

[10]

(b) Your company has commissioned a number of evaluation studies which have shown that your users find your software products consistently "difficult to use". Write a one-page memo to your colleagues in your company on the importance of ***evaluation*** to the success of the interactive systems designed by your company and identify suitable ***evaluation approaches*** to achieve this end**.**

[6]

(c) Distinguish between the three desktop **postures**, identifying their characteristics and what user applications they are suited to.

[4]

Q. 4. (a) The primary purpose of **design principles** is to optimise users' experience (**UE**) with the designed product and minimise users' work. Discuss the contribution of design principles to reducing users' workload (cognitive, memory, visual and physical) and whether there are situations where designers may intentionally increase user workload to increase user engagement. Support your answer with examples where appropriate.

[8]

(b) Elaborate the role of prototyping (both low and high fidelity) in improving the interaction experience of users using technology. Your answer should give consideration of **what** is prototyped and **when** during the design of an interactive experience.

[6]

(c) Which interaction style would you apply to the design of each of the following and why?

- A blood glucose Monitoring Device.
- A high-tech interactive refrigerator which will alert users when they need to purchase stock, when stock is out of date and analyse overall efficiency of energy usage.
- A mobile scheduling application for an international design consultancy.

[6]

NUI Galway
OÉ Gaillimh

Semester I Examinations 2015/ 2016

Exam Code(s)	3BCT121; 3BA1; 4BA1
Exam(s)	B.Sc. in Computer Science and Information Technology B.A.
Module Code(s)	CT318
Module(s)	Human Computer Interaction
Paper No. Repeat Paper	1
External Examiner(s) Internal Examiner(s)	Professor Liam Maguire Prof. Gerard Lyons Dr. Michael Madden Ms. Karen Young
Instructions:	Candidates should answer **Question 1** and **any two other** questions. All questions carry equal marks.
Duration	2 hours
No. of Pages	3
Requirements: None	Release to Library: Yes ☐ No ☐

Q.1 You have been asked to contribute to the design of a **new mobile application** to enable users to manage and organise their **travel plans** or commitments easily in advance of any trips. This application will enable users to schedule their travel arrangements by preferred day, time, and cost (comparing train, bus, taxi, air & boat), select accommodation by cost and location, view and select events of interest during their visit as well as select restaurants or bars, shopping locations etc. while there. Your company is open to other functional possibilities including automatic logging of expenses / costs and other time saving factors for users.

Your company has indicated that they want an initial, early design submission from you to include the following:

(a) A PACT analysis for this application.

[6]

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

[9]

(c) An evaluation plan, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken, for the system which will support comprehensive testing of your design.

[5]

Q. 2. (a) Effective interaction design involves achieving a balance between *divergent* and *convergent* design thinking.

(i) Compare these two thought processes, explaining the design stages each are suited to, and the importance of each to a successful design outcome using examples to illustrate your answer.

[5]

(ii) Laseau's Design Funnel clearly integrates these two processes. Using this funnel elaborate on the different activities involved during the elaboration and reduction design phases for the travel management mobile application described in Q.1 above.

[5]

(b) Effective **error messages** are critical to good user interaction design. What is the purpose of error messages? What factors are important in their design? Design an appropriate error message for a user who is unsuccessfully trying to gain access to a service they do not currently have clearance to access.

[5]

(c) Given that good design is dependent on good designers, not expensive tools, comment on the role of **software tools** in interaction design. Support your answer with relevant examples.

[5]

Q. 3. (a) (i) Distinguish between a *conceptual* model and a *physical* model in design.

(ii) You have been tasked with developing a website for a chain of bookstores. Using *Verplank's Interaction Design Framework*, what are the key elements you will need to capture and represent in your conceptual model?

[8]

(b) Explain Norman's *gulf of execution* and *gulf of evaluation* as they relate to successful interaction design, using appropriate examples.

[4]

(c) Comment on the efficacy of *Anthropomorphism* in interactive system design.

[4]

(d) The choice of **interaction style** is one of the most importance decisions in Interaction Design. What factors should be considered in making this choice? Use examples to illustrate your answer.

[4]

Q. 4. (a) "*Perfection is attained not when there is no longer anything to add, but when there is no longer anything to take away*" (Antoine de Saint Exupery, 1954)

Analyse the above statement in light of your study of effective **visual design**, including consideration of its application to a **website** of choice in your answer.

[8]

(b) Your company has commissioned a number of evaluation studies which have shown that your users find your software products consistently "difficult to use". Write a one-page memo to your colleagues in your company on the importance of **mental models** to the success of the interactive systems designed by your company.

[8]

(c) What makes something easy to use? What are the properties of an interactive system that make it easy to use for the elderly? And for children?

[4]

Autumn Examinations 2014/ 2015

Exam Code(s)	3BCT121; 3BA1; 4BA1;1MF1; 1SD1
Exam(s)	B.Sc. in Computer Science and Information Technology B.A. MSc in Software Design and Development Higher Diploma in Software Design and Development
Module Code(s)	CT318 CT865
Module(s)	Human Computer Interaction
Paper No. Repeat Paper	1
External Examiner(s) Internal Examiner(s)	Professor Liam Maguire Prof. Gerard Lyons Dr. Michael Madden Ms. Karen Young
Instructions:	Candidates should answer **Question 1** and **two other** questions. All questions carry equal marks.
Duration	2 hours
No. of Pages	3

Requirements:
MCQ
Handout
Statistical/ Log Tables
Cambridge Tables
Graph Paper
Log Graph Paper
Other Materials

Release to Library: Yes ☐ No ☐

Q.1 You have been asked to design an interactive web-based ***foreign language learning environment*** for children to support their development of effective language skills. The system must be appealing and fun to use, engage the children, and enable navigation by a variety of means (e.g. by topic, or through sequential lessons, or by activity).

The site must also store the children's details, greet them when they enter, store a record of their performance on various games and tasks, and recommend areas for further attention. The system is competing against a variety of commercial gaming platforms and so must be very well designed to appeal to its audience.

The company has indicated that they want an initial design submission from you to include the following:

(a) A PACT analysis for this application.

[6]

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

[9]

(c) An evaluation plan, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken, for the system which will support comprehensive testing of your design.

[5]

Q. 2. (a) *Effective interaction design is ultimately about the correct assignment of responsibilities to the parties participating in the interaction, i.e. the human and the computer*.
From your study of the various theories, models, processes, and techniques of interaction design, comment on the validity of the above statement, illustrating your response with appropriate examples as necessary.

[12]

(b) The primary purpose of **design principles** is to optimise users' experience (**UE**) with the designed product and minimise users' work. Discuss the contribution of design principles to reducing users' workload (cognitive, memory, visual and physical) and whether there are situations where designers may intentionally increase user workload to increase user engagement. Support your answer with examples where appropriate.

[8]

Q. 3. **(a)** Laseau's *Design Funnel* presents a simple model of the design process. The expanding and contracting funnels correspond to distinct design activities with their associated approaches and methods. Using the example of an educational game being developed to support mathematics education in second level schools (i.e. for 12-18 year old students) compare the focus and design activities of both funnels and elaborate on the relationship between the two.

[10]

(b) (i) Distinguish between a *conceptual* model and a *physical* model in design.

[4]

(ii) You have been tasked with developing a mobile shopping app (application). Outline the progression from Conceptual to Physical Design in this context, clearly identifying the inputs and outputs for each design phase.

[6]

Q. 4. **(a)** You have been asked to design a *remote control* device that can be used to control the lighting, heating, curtains/blinds for both domestic and public settings. Prepare a prototype design, outlining the *user considerations* you found relevant in solving this problem.

[8]

(b) "*Perfection is attained not when there is no longer anything to add, but when there is no longer anything to take away*" (Antoine de Saint Exupery, 1954)

Analyse the above statement in light of your study of effective **visual design**, including consideration of its application to a **computer system of your choice** in your answer.

[7]

(c) In designing an interactive application discuss the role of *world* and *head* vectors in enabling effective progression from novice to expert use, illustrating your response with appropriate examples.

[5]

Semester I Examinations 2014/ 2015

Exam Code(s)	3BCT121; 3BA1; 4BA1;1MF1; 1SD1
Exam(s)	B.Sc. in Computer Science and Information Technology B.A. MSc in Software Design and Development Higher Diploma in Software Design and Development
Module Code(s)	CT318 CT865
Module(s)	Human Computer Interaction
Paper No. Repeat Paper	1
External Examiner(s) Internal Examiner(s)	Professor Liam Maguire Prof. Gerard Lyons Dr. Michael Madden Ms. Karen Young
Instructions:	Candidates should answer **Question 1** and **two other** questions. All questions carry equal marks.
Duration	2 hours
No. of Pages	3

Requirements:
MCQ
Handout
Statistical/ Log Tables
Cambridge Tables
Graph Paper
Log Graph Paper
Other Materials

Release to Library: Yes ☐ No ☐

Q.1 You have been asked to design an interactive kiosk system to support a bike rental scheme in Galway as part of the city's efforts to become more environmentally conscious. The system will operate similarly to those deployed in other European cities which facilitate short journeys within the city: i.e. bicycles are kept at a number of parking stations throughout the city, and members of the public can borrow a bicycle at any time and return it to any parking station after use. The system design must be robust enough for public settings, enable user data input (user details etc.) and payment details (credit card: a deposit amount to cover damage or theft of bike will be frozen on the card); it should also provide maps of interest and identify bike-drop-off points and general bike availability.

Your company has indicated that they want an initial, early design submission from you to include the following:

(a) A PACT analysis for this application.

[6]

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

[9]

(c) An evaluation plan, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken, for the system which will support comprehensive testing of your design.

[5]

Q. 2. (a) Interaction Design is concerned with the design of digital devices to meet the *physical*, *emotional* and *intellectual* needs of the people using these devices. Analyse the contribution of the **models** and **frameworks** covered in this course to meeting this design goal throughout all stages of the Systems Development Lifecycle (SDLC).

[12]

(b) The role of human cognition has been extensively researched in order to better understand HCI success. Successful visual icon design can be understood in relation to the factors that determine **meaningfulness** for users. Elaborate on these factors and the role they play in successful icon design. Use the example of designing icons for your class project to illustrate your answer.

[8]

Q. 3. (a) Laseau's *Design Funnel* presents a simple model of the design process. The expanding and contracting funnels correspond to distinct design activities with their associated approaches and methods.
Using the example of an educational game being developed for second language learning in second level schools (i.e. for 12-18 year old students) compare the focus and design activities of both funnels and elaborate on the relationship between the two.

[10]

(b) Elaborate the role of prototyping (both low and high fidelity) in improving the interaction experience of users using technology. Your answer should give consideration of **what** is prototyped and **when** during the design of an interactive experience.

[6]

(c) The choice of **interaction style** is one of the most importance decisions in Interaction Design. What factors should be considered in making this choice? Use examples to illustrate your answer.

[4]

Q. 4. (a) "*Perfection is attained not when there is no longer anything to add, but when there is no longer anything to take away*" (Antoine de Saint Exupery, 1954)

Analyse the above statement in light of your study of effective **visual design**, including consideration of its application to a website of choice in your answer.

[8]

(b) The effective representation of information at the User Interface (UI) greatly improves the User Experience (UE) enabling effortless interaction and minimising users' work.

Discuss the role of **design principles** in supporting this process, specifically identifying those principles which contribute to good representation at the UI.

[8]

(c) Distinguish between the three desktop **postures**, identifying their characteristics and what user applications they are suited to.

[4]

Autumn Examinations 2013/ 2014

Exam Code(s)	3BCT121; 3BA1; 4BA1;1MF1; 1SD1
Exam(s)	B.Sc. in Computer Science and Information Technology B.A. MSc in Software Design and Development Higher Diploma in Software Design and Development
Module Code(s)	CT318 CT865
Module(s)	Human Computer Interaction
Paper No. Repeat Paper	1
External Examiner(s) Internal Examiner(s)	Professor Liam Maguire Prof. Gerard Lyons Dr. Michael Madden Ms. Karen Young
Instructions:	Candidates should answer **Question 1** and **two other** questions. All questions carry equal marks.
Duration	2 hours
No. of Pages	3

Requirements:
MCQ
Handout
Statistical/ Log Tables
Cambridge Tables
Graph Paper
Log Graph Paper
Other Materials

Release to Library: Yes ☐ ☐

Q.1 You have been asked to design an application suitable for a mobile device to facilitate parking at NUI, Galway. It is envisaged that the application could then be deployed in other organisations (both public and private sector organisations). Once deployed on the registered user's phone, the application will indicate the available car park spaces for the user (staff, student, visitor) on campus. The application will also facilitate payment of parking tariffs by registered users, enabling the "Pay & Display" tariff to be paid via the phone (or website) and "topped up" in the same way should the user be delayed at a meeting etc.

Your company has indicated that they want an initial, early design submission from you to include the following:

(a) A PACT analysis for this application.

[6]

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

[9]

(c) An evaluation plan, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken, for the system which will support comprehensive testing of your design.

[5]

Q. 2. (a) *Anthropomorphism has no place in interactive software design*. Comment on this statement supporting your answer with relevant examples.

[7]

(b) HCI incorporates the study of novel interaction techniques with technology. Current interactions largely rely on vision (screen presentation of information) and touch (keyboard, touch-screens, etc.). You have been asked to propose a new interactive technique for a system being developed for use in a busy medical environment. Prepare a memo outlining the shortcomings of traditional interaction in this context, and proposing the benefits of this new interactive technique (including successful examples of its application in other contexts) to be presented to your company's management team.

[8]

(c) In designing an interactive application there are many guidelines available to help the designer. Discuss the type and role of guidelines in producing good interactive web-based systems.

[5]

Q. 3. (a) (i) Distinguish between a *conceptual* model and a *physical* model in design.

[4]

(ii) You have been tasked with developing a mobile shopping app (application). Outline the progression from Conceptual to Physical Design in this context, clearly identifying the inputs and outputs for each design phase.

[6]

(b) Write a one-page memo to your colleagues in your software design company, proposing the adoption of ***co-operative evaluation*** techniques during design to improve the success of the interactive systems designed by your company.

[5]

(c) Comment on the role of *posture* in interactive system design: what it is and how it impacts the design choices made.

[5]

Q. 4. (a) Effective interaction design is ultimately about the correct assignment of responsibilities to the parties participating in the interaction, i.e. the human and the computer. From your study of the various theories, models, processes, and techniques of interaction design, comment on the validity of the above statement, illustrating your response with appropriate examples as necessary.

[10]

(b) In designing an interactive application discuss the role of *world* and *head* vectors in enabling effective progression from novice to expert use, illustrating your response with appropriate examples.

[5]

(c) Using appropriate examples, explain Norman's *gulf of execution* and *gulf of evaluation* as they relate to successful interaction design.

[5]

NUI Galway
OÉ Gaillimh

Semester I Examinations 2013/ 2014

Exam Code(s)	3BCT121; 3BA1; 4BA1;1MF1; 1SD1
Exam(s)	B.Sc. in Computer Science and Information Technology B.A. MSc in Software Design and Development Higher Diploma in Software Design and Development
Module Code(s)	CT318 CT865
Module(s)	Human Computer Interaction
Paper No. Repeat Paper	1
External Examiner(s) Internal Examiner(s)	Professor Liam Maguire Prof. Gerard Lyons Dr. Michael Madden Ms. Karen Young
Instructions:	Candidates should answer **Question 1** and **two other** questions. All questions carry equal marks.
Duration	2 hours
No. of Pages	3

Requirements:
MCQ
Handout
Statistical/ Log Tables
Cambridge Tables
Graph Paper
Log Graph Paper
Other Materials

Release to Library: Yes ☐ ☐

Q.1 You have been asked to design an interactive system (website, mobile application) to support the city's *Arts Festival*. The system should provide information on all Arts Festival events: date, location, producer, performers, reviews etc. In addition, the system must support ticket bookings and payments, as well as providing interactive demos and snippets from the performances and opportunities to get involved in the interactive digital performances or post reviews or play "games" associated with the festival.

The commissioning company has indicated that they want an initial design submission from you to include the following:

(a) A PACT analysis for this application.

[6]

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

[9]

(c) An evaluation plan, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken, for the system which will support comprehensive testing of your design.

[5]

Q. 2. (a) *Easy-Pal* is your "friendly" digital companion. *Easy-Pal* is an affective digital agent that moves with you when you move: across device (e.g. mobile phone to car to TV) and context (meetings, commuting, social occasions, etc.). *Easy-Pal* supports you emotionally enabling you to stay connected with your loved ones wherever you are. Discuss the design issues that *Easy-Pal* raises and produce a conceptual model for your design.

[8]

(b) Good design requires good designers, not expensive tools.

(i) From your study of the various theories, models, processes, and techniques of interaction design, comment on the validity of the above statement.

[6]

(ii) What are the implications of your analysis in (i) above for interaction design education? Propose a course outline for a one-semester course in Interaction Design based on your analysis.

[6]

Q. 3. (a) (i) Distinguish between a *conceptual* model and a *physical* model in design.

[4]

(ii) You have been tasked with developing a mobile shopping app (application). Outline the progression from Conceptual to Physical Design in this context, clearly identifying the inputs and outputs for each design phase.

[6]

(b) Analyse the role and contribution of the various models covered in this course to effective interaction design.

[5]

(c) Comment on the role and efficacy of User Interface *design guidelines* in supporting interactive system design.

[5]

Q. 4. (a) Your company has commissioned a number of evaluation studies which have shown that your users find your software products consistently "difficult to use". Write a one-page memo to your colleagues in your company on the importance of ***evaluation*** to the success of the interactive systems designed by your company and identify suitable ***evaluation approaches*** to achieve this end**.**

[6]

(b) Effective interaction design involves achieving a balance between *divergent* and *convergent* design thinking. Compare these two thought processes, explaining the design stages each are suited to, and the importance of each to a successful design outcome using examples to illustrate your answer.

[6]

(c) HCI incorporates the study of novel interaction techniques with technology. Current interactions largely rely on vision (screen presentation of information) and touch (keyboard, touch-screens, etc.). You have been asked to propose a new interactive technique for a system being developed for use in a busy medical environment. Prepare a memo outlining the shortcomings of traditional interaction in this context, and proposing the benefits of this new interactive technique (including successful examples of its application in other contexts) to be presented to your company's management team.

[8]

NUI Galway
OÉ Gaillimh

Autumn Examinations 2012/ 2013

Exam Code(s)	3BCT121; 3BA1; 4BA1;1MF1; 1SD1
Exam(s)	B.Sc. in Computer Science and Information Technology B.A. MSc in Software Design and Development Higher Diploma in Software Design and Development
Module Code(s)	CT318 CT865
Module(s)	Human Computer Interaction
Paper No. Repeat Paper	1
External Examiner(s) Internal Examiner(s)	Prof. Michael O'Boyle Prof. Gerard Lyons Dr. Michael Madden Ms. Karen Young
Instructions:	Candidates should answer **Question 1** and **two other** questions. All questions carry equal marks.
Duration	2 hours
No. of Pages	3

Requirements:
MCQ
Handout
Statistical/ Log Tables
Cambridge Tables
Graph Paper
Log Graph Paper
Other Materials

Release to Library: Yes ☐ ☐

Q.1 You have been asked to design an interactive web-based ***maths learning environment*** for children to support their development of effective maths skills. The system must be appealing and fun to use, engage the children, and enable navigation by a variety of means (e.g. by topic, or through sequential lessons, or by activity).

The site must also store the children's details, greet them when they enter, store a record of their performance on various games and tasks, and recommend areas for further attention. The system is competing against a variety of commercial gaming platforms and so must be very well designed to appeal to its audience.

The company has indicated that they want an initial design submission from you to include the following:

(a) A PACT analysis for this application.

[6]

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

[9]

(c) An evaluation plan, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken, for the system which will support comprehensive testing of your design.

[5]

2. **(a)** *Anthropomorphism has no place in interactive software design and is best left to advertising*. Do you agree? Explore the role of anthropomorphism in effective interactive software development, supporting your answer with relevant examples.

[6]

(b) You have been asked to design a *remote control* device that can be used to control the lighting, heating, curtains/blinds for both domestic and public settings. Prepare a prototype design, outlining the *design principles* you found relevant in solving this problem.

[8]

(c) Which interaction style would you apply to the design of each of the following and why?

- A blood glucose Monitoring Device
- A high-tech interactive refrigerator which will alert users when they need to purchase stock, when stock is out of date and analyse overall efficiency of energy usage.
- A Web-based project management application for project management professionals.

[6]

Q. 3. (a) (i) Distinguish between a *conceptual* model and a *physical* model in design.

(ii) You have been tasked with developing a website for a chain of gyms. Outline the progression from Conceptual to Physical Design in this context, clearly identifying the inputs and outputs for each design phase.

[8]

(b) Your company has commissioned a number of evaluation studies which have shown that your users find your software products consistently "difficult to use". Write a one-page memo to your colleagues in your company on the importance of ***prototyping*** to the success of the interactive systems designed by your company and identify suitable ***prototyping tools***.

[6]

(c) In designing an interactive application discuss the role of *world* and *head* vectors in enabling effective progression from novice to expert use, illustrating your response with appropriate examples.

[6]

Q. 4. (a) Effective interaction design is ultimately about the correct assignment of responsibilities to the parties participating in the interaction, i.e. the human and the computer.

(i) From your study of the various theories, models, processes, and techniques of interaction design, comment on the validity of the above statement.

[6]

(ii) Discuss issues of the allocation of functions between people and software specifically in the context of a Web-based project management application for project management professionals.

[4]

(b) Using appropriate examples, explain Norman's *gulf of execution* and *gulf of evaluation* as they relate to successful interaction design.

[5]

(c) Good design requires good designers, not expensive *tools*. Comment on the validity of this statement and what it means for interaction design education. Support your answer with relevant examples.

[5]

NUI Galway
OÉ Gaillimh

Semester I Examinations 2012/ 2013

Exam Code(s)	3BCT121; 3BA1; 4BA1;1MF1; 1SD1
Exam(s)	B.Sc. in Computer Science and Information Technology B.A. MSc in Software Design and Development Higher Diploma in Software Design and Development
Module Code(s)	CT318 CT865
Module(s)	Human Computer Interaction
Paper No. Repeat Paper	1
External Examiner(s) Internal Examiner(s)	Prof. Michael O'Boyle Prof. Gerard Lyons Dr. Michael Madden Ms. Karen Young
Instructions:	Candidates should answer **Question 1** and **two other** questions. All questions carry equal marks.
Duration	2 hours
No. of Pages	3

Requirements:
MCQ
Handout
Statistical/ Log Tables
Cambridge Tables
Graph Paper
Log Graph Paper
Other Materials

Release to Library: Yes ☐ ☐

Q.1 You have been asked to design an application for recording and analysing match scores suitable for many different sporting environments. The initial brief requires the application to be developed to record scores (from play and frees), frees, substitutions, yellow and red cards in GAA matches. The mobile phone is the likely device of choice for this application given the use context. The system must be easy to use, and enable quick data entry, as well as ease of data transfer or comparative analysis of statistics across matches, teams etc.

This system will be competing against a variety of other applications in appstores and so must be very well designed to appeal to its audience.

The company has indicated that they want an initial design submission from you to include the following:

(a) A PACT analysis for this application.

[6]

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

[9]

(c) An evaluation plan, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken, for the system which will support comprehensive testing of your design.

[5]

Q. 2. (a) You have been tasked with developing a prototype UI (User Interface) for your company's new online booking system (travel, hotel, carhire etc.). The brief highlights the need to minimise users' negative emotions (frustration, fear, anger, etc.) when using this system. Discuss the design issues that this new UI raises, the role of human emotion in affective design and outline a conceptual model for the design.

[10]

(b) Design principles are intended to cover all interactive systems. Their generalisability is both their strength and weakness. Discuss the role of design principles in developing good interactive systems, illustrating your response with examples as appropriate. In your answer consider the use of these principles in all designs: how important is context in the application of these principles?

[10]

Q. 3. (a) Since the advent of the Graphical User Interface (GUI), User Interface design has been overly reliant on vision as a means of communicating with users. Discuss the advantages and disadvantages of augmenting the User Interface with (a) sound and (b) haptics. In your view, which has the most potential and why? Support your answer with specific examples.

[8]

(b) Your company has commissioned a number of evaluation studies which have shown that your users find your software products consistently "difficult to use". Write a one-page memo to your colleagues in your company on the importance of ***prototyping*** to the success of the interactive systems designed by your company and identify suitable ***prototyping tools***.

[6]

(c) Choose an appropriate *evaluation strategy* for each of the following situations. In each case identify: the participants, the technique to be used, and the representative tasks to be examined.

(i) You are designing a new on-line shopping and home delivery system for a new supermarket chain.
(ii) You have been asked to design a high-tech interactive refrigerator which will alert users when they need to purchase stock, when stock is out of date and analyse overall efficiency of energy usage.
(iii) You want to design a new game application for the iPhone.

[6]

Q. 4. (a) Effective interaction design is ultimately about the correct assignment of responsibilities to the parties participating in the interaction, i.e. the human and the computer.

(i) From your study of the various theories, models, processes, and techniques of interaction design, comment on the validity of the above statement.

[6]

(ii) Discuss issues of the allocation of functions between people and software specifically in the context of electronic calendars.

[4]

(b) Write a one-page memo to your colleagues in your software design company, proposing the adoption of ***co-operative evaluation*** techniques during design to improve the success of the interactive systems designed by your company.

[6]

(c) Comment on the efficacy of *software tools* in supporting interactive system design.

[4]

NUI Galway
OÉ Gaillimh

Autumn Examinations 2011/ 2012

Exam Code(s)	3IF121; 3BA1; 4BA1;1MF1; 1SD1
Exam(s)	B.Sc. in Information Technology B.A. MSc in Software Design and Development Higher Diploma in Software Design and Development
Module Code(s)	CT318 CT865
Module(s)	Human Computer Interaction
Paper No. Repeat Paper	1
External Examiner(s) Internal Examiner(s)	Prof. Michael O'Boyle Dr. Jim Duggan Ms. Karen Young
Instructions:	Candidates should answer **Question 1** and **two other** questions. All questions carry equal marks.
Duration	2 hours
No. of Pages	3

Requirements:
MCQ
Handout
Statistical/ Log Tables
Cambridge Tables
Graph Paper
Log Graph Paper
Other Materials

Release to Library: Yes ☐ ☐

Q.1. You have been asked to design an interactive system (web / mobile web-based) for an airport food hall. The system must support the user in browsing, ordering and payment. Payments for different vendors within the one order are processed separately for each vendor, but together as one bill for the customer. Users can order in advance, i.e. before travelling, or before disembarking from plane, and notify the system of an expected collection time. Your client has stressed the importance of an effective, easy to use, and well-organised interface for their users, given the time pressures customers face.

The company has indicated that they want an initial design submission from you to include the following:

(a) A PACT analysis for this application.

[6]

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

[9]

(c) An evaluation plan, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken, for the system which will support comprehensive testing of your design.

[5]

Q. 2. (a) Write a one-page memo to your colleagues in your software design company, proposing the adoption of *interactive storyboarding* during design to improve the success of the interactive systems designed by your company.

[6]

(b) You have been tasked with developing a prototype UI (User Interface) for your company's new home entertainment system. The brief highlights the need to minimise users' negative emotions (frustration, fear, anger, etc.) when using this new system. Discuss the design issues that this new UI raises, and outline a conceptual model for the design.

[8]

(c) Which interaction style would you apply to the design of each of the following and why?

- A mobile car finder (for car parks) application
- A music education application
- A budget management system for domestic use

[6]

Q. 3. (a) (i) Distinguish between a *conceptual* model and a *physical* model in design.

(ii) You have been tasked with developing a website for a chain of bookstores. Outline the progression from Conceptual to Physical Design in this context, clearly identifying the inputs and outputs for each design phase.

[8]

(b) What makes something easy to use? What are the properties of an interactive system that make it easy to use? Modify this list to make it specific to a technically savvy population.

[6]

(c) Good design requires good designers, not expensive tools. Comment on the validity of this statement and what it means for interaction design education. Support your answer with relevant examples.

[6]

Q. 4. (a) Research in human computer interaction has identified two distinct approaches to this cooperative interaction: the human centred and machine centred view. Norman characterises the differences in these approaches as those between analogue and digital agents. Do you agree with this statement? Why? What does this mean for effective interaction design? Use examples to illustrate your response

[10]

(b) In designing an interactive application discuss the role of *world* and *head* vectors in enabling effective progression from novice to expert use, illustrating your response with appropriate examples.

[5]

(c) In designing an interactive application there are many guidelines available to help the designer. Discuss the type and role of guidelines in producing good interactive web-based systems.

[5]

NUI Galway
OÉ Gaillimh

Semester I Examinations 2011/ 2012

Exam Code(s)	3IF121; 3BA1; 4BA1;1MF1; 1SD1
Exam(s)	B.Sc. in Information Technology B.A. MSc in Software Design and Development Higher Diploma in Software Design and Development
Module Code(s)	CT318 CT865
Module(s)	Human Computer Interaction
Paper No. Repeat Paper	1
External Examiner(s) Internal Examiner(s)	Prof. Michael O'Boyle Dr. Jim Duggan Ms. Karen Young
Instructions:	Candidates should answer **Question 1** and **two other** questions. All questions carry equal marks.
Duration	2 hours
No. of Pages	3

Requirements:
MCQ
Handout
Statistical/ Log Tables
Cambridge Tables
Graph Paper
Log Graph Paper
Other Materials

Release to Library: Yes ☐ No ☐

Q.1 You have been asked to design an interactive web-based ***music learning environment*** for children to support their development of effective music skills. The system must be appealing and fun to use, engage the children, and enable navigation by a variety of means (e.g. by topic, or through sequential lessons, or by activity).

The site must also store the children's details, greet them when they enter, store a record of their performance on various games and tasks, and recommend areas for further attention. The system is competing against a variety of commercial gaming platforms and so must be very well designed to appeal to its audience.

The company has indicated that they want an initial design submission from you to include the following:

(a) A PACT analysis for this application.

[6]

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

[9]

(c) An evaluation plan, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken, for the system which will support comprehensive testing of your design.

[5]

Q. 2. (a) *Anthropomorphism has no place in interactive software design and is best left to advertising*. Do you agree? Explore the role of anthropomorphism in effective interactive software development, supporting your answer with relevant examples.

[6]

(b) You have been asked to design a *remote control* device that can be used to control the lighting, heating, curtains/blinds for both domestic and public settings. Prepare a prototype design, outlining the *design principles* you found relevant in solving this problem.

[8]

(c) Which interaction style would you apply to the design of each of the following and why?

- A Mobile blood pressure Monitoring Device
- An Events Ticketing Machine
- A Schedule Management System for Mobile and Desktop Use

[6]

Q. 3. (a) (i) Distinguish between a *conceptual* model and a *physical* model in design.

(ii) You have been tasked with developing a website for a chain of gyms. Outline the progression from Conceptual to Physical Design in this context, clearly identifying the inputs and outputs for each design phase.

[8]

(b) Given that good design is dependent on good designers, not expensive tools, comment on the role of **software tools** in interaction design. Support your answer with relevant examples.

[6]

(c) Choose an appropriate *evaluation strategy* for each of the following situations. In each case identify: the participants, the technique to be used, and the representative tasks to be examined.

(i) You are designing a new web-based project management application for project management professionals.
(ii) You have been asked to develop a web site for your local sports club.
(iii) You want to design a new game application for the iPhone.

[6]

Q. 4. (a) Effective interaction design is ultimately about the correct assignment of responsibilities to the parties participating in the interaction, i.e. the human and the computer. From your study of the various theories, models, processes, and techniques of interaction design, comment on the validity of the above statement, illustrating your response with appropriate examples as necessary.

[10]

(b) In designing an interactive application discuss the role of *world* and *head* vectors in enabling effective progression from novice to expert use, illustrating your response with appropriate examples.

[5]

(c) Using appropriate examples, explain Norman's *gulf of execution* and *gulf of evaluation* as they relate to successful interaction design.

[5]

NUI Galway
OÉ Gaillimh

Autumn Examinations 2010/ 2011

Exam Code(s)	3IF121; 3BA1; 4BA1;1MF1; 1SD1
Exam(s)	B.Sc. in Information Technology B.A. MSc in Software Design and Development Higher Diploma in Software Design and Development
Module Code(s)	CT318 CT865
Module(s)	Human Computer Interaction
Paper No. Repeat Paper	1
External Examiner(s) Internal Examiner(s)	Prof. Michael O'Boyle Dr. Jim Duggan Ms. Karen Young
Instructions:	Candidates should answer **Question 1** and **two other** questions. All questions carry equal marks.
Duration	2 hours
No. of Pages	3

Requirements:
MCQ
Handout
Statistical/ Log Tables
Cambridge Tables
Graph Paper
Log Graph Paper
Other Materials

Release to Library: Yes ☐ No ☐

Q.1. You have been asked to design the information system for a new cycle path network that is to run through parts of Galway town and surrounding areas. The aim of the system is provide information on directions and distances for leisure cyclists to the main points of interest in the town. It also needs to provide information on other things, such as bus and train times for those cyclists who are commuting to and from work.

(a) Undertake a PACT analysis for this application.

[5]

(b) Produce a paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make.

[9]

(c) Prepare an evaluation plan, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken, for the system which will support comprehensive testing of your design.

[6]

Q. 2. (a) Good design requires good designers, not expensive tools. Comment on the validity of this statement and what it means for interaction design education. Support your answer with relevant examples.

[8]

(b) Distinguish between a *conceptual model* and a *prototype*.

[4]

(c) Design principles are intended to cover all interactive systems. Their generalisability is both their strength and weakness. Discuss the role of design principles in developing good interactive systems. In your answer consider the use of these principles in all designs: how important is context in the application of these principles?

[8]

Q. 3. (a) Go-Pal is your friendly mobile companion. Go-Pal moves from your alarm clock to your mobile phone to your TV. Go-Pal helps you with things such as recording your favourite TV programme, setting the security alarms on your house, remembering your shopping list and remembering special days such as birthdays. Discuss the design issues that Go-Pal raises.

[10]

(b) Comment on the role of *posture* in interactive system design: what it is and how it impacts the design choices made.

[4]

(b) Choose an appropriate evaluation method for each of the following situations. In each case identify: the participants, the technique used, the representative tasks to be examined, measurements that would be appropriate, and an outline plan for carrying out the evaluation.

(i) You are designing a new web-based project management application for project management professionals.

(ii) You have a prototype for an online television licence payment system that you wish to test before release.

(iii) You have designed and implemented a new multi-player game system and want to evaluate it before release.

[6]

Q. 4. (a) You have been tasked with developing a prototype UI (User Interface) for your company's new time management system. The brief highlights the need to minimise users' negative emotions (frustration, fear, anger, etc.) when using this new system. Discuss the design issues that this new UI raises, and outline a conceptual model for the design.

[8]

(b) Write a one-page memo to your colleagues in your software design company, advocating the requirement to incorporate physiological data collection in all interactive product evaluations from a future date.

[6]

(c) What makes something easy to use? What are the properties of an interactive system that make it easy to use? Modify your list to make it specific to an ageing population.

[6]

NUI Galway
OÉ Gaillimh

Semester I Examinations 2010/ 2011

Exam Code(s)	3IF121; 3BA1; 4BA1;1MF1; 1SD1
Exam(s)	B.Sc. in Information Technology B.A. MSc in Software Design and Development Higher Diploma in Software Design and Development
Module Code(s)	CT318 CT865
Module(s)	Human Computer Interaction
Paper No. Repeat Paper	1
External Examiner(s) Internal Examiner(s)	Prof. Michael O'Boyle Dr. Jim Duggan Ms. Karen Young
Instructions:	Candidates should answer **Question 1** and **two other** questions. All questions carry equal marks.
Duration	2 hours
No. of Pages	3

Requirements:
MCQ
Handout
Statistical/ Log Tables
Cambridge Tables
Graph Paper
Log Graph Paper
Other Materials

Release to Library: Yes ☐ ☐

Q.1 You have been asked to design an application suitable for a mobile device to facilitate parking at NUI, Galway. It is envisaged that the application could then be deployed in other organisations (both public and private sector organisations). Once deployed on the registered user's phone, the application will indicate the available car park spaces for the user (staff, student, visitor) on campus. The application will also facilitate payment of parking tariffs by registered users, enabling the "Pay & Display" tariff to be paid via the phone (or website) and "topped up" in the same way should the user be delayed at a meeting etc.

Your company has indicated that they want an initial, early design submission from you to include the following:

(a) A PACT analysis for this application.

[6]

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

[9]

(c) An evaluation plan, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken, for the system which will support comprehensive testing of your design.

[5]

Q. 2. (a) Given that good design is dependent on good designers, comment on the role of **effective design education** in interaction design. Your answer should include consideration of theories, principles, models, and guidelines, and be supported by relevant examples.

[9]

(b) Successful HCI is heavily dependent on *evaluation.* You are keen to propose a more rigorous evaluation methodology for your organisation. Prepare a memo outlining the shortcomings of the traditional evaluation techniques deployed by your organisation (usability lab testing of prototype and final designs), and proposing the benefits of this new evaluation approach (including successful examples of its application in other contexts) to be presented to your company's management team.

[7]

(c) What makes something easy to *learn*? What are the properties of an interactive system that make it easy to *learn* for beginners to intermediate and expert users?

[4]

Q. 3. (a) *"Within a decade, industry watchers say, the spoken interface will fundamentally alter the way we interact with machines, just as the GUI did a decade ago." Chris Chinnock (1995)*

Discuss the above statement in light of developments in interaction over the past 15 years.

[9]

(b) Comment on the role of *posture* in interactive system design: what it is and how it impacts the design choices made.

[5]

(c) Choose an appropriate *requirements collection strategy* for each of the following situations. In each case identify: the participants, the technique to be used, the representative tasks to be examined, and any evaluation or verification techniques that would be appropriate.

- **(i)** You are designing a new web-based project management application for project management professionals.
- **(ii)** You have been assigned responsibility for developing a web site for your local sports club.
- **(iii)** You want to design a new game application for the iPhone.

[6]

Q. 4. (a) You have been tasked with developing a prototype UI (User Interface) for your company's new home entertainment system. The brief highlights the need to minimise users' negative emotions (frustration, fear, anger, etc.) when using this new system. Discuss the design issues that this new UI raises, and outline a conceptual model for the design.

[8]

(b) Your company has commissioned a number of evaluation studies which have shown that your users find your software products consistently "difficult to use". Write a one-page memo to your colleagues in your company on the importance of **mental models** to the success of the interactive systems designed by your company.

[6]

(c) Users confront very different usability challenges on handheld devices from those they encounter when interacting with a Web site on a computer. Analyse the differences between the interactions on both platforms and identify appropriate usability testing strategies for mobile device applications.

[6]

Autumn Repeat Examinations 2009/ 2010

Exam Code(s)	3IF121; 3BA1; 4BA1;1MF1; 1SD1
Exam(s)	B.Sc. in Information Technology B.A. MSc in Software Design and Development Higher Diploma in Software Design and Development
Module Code(s)	CT318 CT865
Module(s)	Human Computer Interaction
Paper No. Repeat Paper	1
External Examiner(s) Internal Examiner(s)	Prof. Michael O'Boyle Prof. Gerard Lyons * Ms. Karen Young
Instructions:	Candidates should answer any **three** questions. All questions carry equal marks.
Duration	2 hours
No. of Pages	3

Requirements:

MCQ
Handout
Statistical/ Log Tables
Cambridge Tables
Graph Paper
Log Graph Paper
Other Materials

Release to Library: Yes ☐ ☐

Q.1 You have been asked to design an interactive system to support a bike rental scheme in Galway, similar to those deployed in other large European cities: bikes can be collected from a number of points around the city and returned to any other point. The system must be robust for public settings, enable user data input (user details etc.) and payment details; it should also provide maps of interest and identify bike-drop-off points and general bike availability, as well as a means to report damage to bikes or guidelines for puncture repair, etc.

Your company has indicated that they want an initial design submission from you to include the following:

(a) A PACT analysis for this application.

[5]

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

[9]

(c) An evaluation plan, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken, for the system which will support comprehensive testing of your design.

[6]

Q. 2. (a) *Anthropomorphism has no place in interactive software design*. Comment on this statement supporting your answer with relevant examples.

[7]

(b) HCI incorporates the study of novel interaction techniques with technology. Current interactions largely rely on vision (screen presentation of information) and touch (keyboard, touch-screens, etc.). You have been asked to propose a new interactive technique given the many shortcomings of traditional vision and touch interaction. Outline the difficulties with traditional technology interaction and the benefits of your new proposed interactive technique in a memo to the management team in your software organisation.

[8]

(c) In designing an interactive application there are many guidelines available to help the designer. Discuss the type and role of guidelines in producing good interactive web-based systems.

[5]

Q. 3. (a) EZ-Pal is your friendly mobile companion. EZ-Pal moves from your alarm clock to your mobile phone to your TV. EZ-Pal helps you with things such as recording your favourite TV programme, setting the security alarms, heating and lighting on your house, remembering your shopping list and remembering special days such as birthdays. Discuss the design issues that EZ-Pal raises and outline a conceptual model for the design.

[10]

(b) Write a one-page memo to your colleagues in your software design company, proposing the adoption of co-operative evaluation techniques during design to improve the success of the interactive systems designed by your company.

[5]

(c) What makes something easy to use? What are the properties of an interactive system that make it easy to use for an ageing population?

[5]

Q. 4. (a) Evaluation is critical to the development of effective interaction systems. HCI provides a variety of models, frameworks, and techniques to support the developer in properly evaluating their interactive systems before, during and after development. Compare and contrast the various approaches you have studied during this module, illustrating your answer with examples.

[9]

(b) Comment on the efficacy of *software tools* in supporting interactive system design.

[5]

(c) Choose an appropriate evaluation method for each of the following situations. In each case identify: the participants, the technique used, the representative tasks to be examined, measurements that would be appropriate, and an outline plan for carrying out the evaluation.

- **(i)** You are designing a new information kiosk for a museum and you wish to test what type of interaction technique and icons will be most intuitive.
- **(ii)** You have an idea for a new parking control system to be used by staff and students of NUI, Galway to reduce search time for a vacant car park space, and resulting traffic congestion on campus.
- **(iii)** You have designed and implemented a new energy usage assessment tool for domestic use and want to test it before release.

[6]

NUI Galway
OÉ Gaillimh

Semester I Examinations 2009/ 2010

Exam Code(s)	3IF121; 3BA1; 4BA1;1MF1; 1SD1
Exam(s)	B.Sc. in Information Technology B.A. MSc in Software Design and Development Higher Diploma in Software Design and Development
Module Code(s)	CT318 CT865
Module(s)	Human Computer Interaction
Paper No. Repeat Paper	1
External Examiner(s) Internal Examiner(s)	Prof. Michael O'Boyle Prof. Gerard Lyons * Ms. Karen Young
Instructions:	Candidates should answer **Question 1** and **two other** questions. All questions carry equal marks.
Duration	2 hours
No. of Pages	3

Requirements:
MCQ
Handout
Statistical/ Log Tables
Cambridge Tables
Graph Paper
Log Graph Paper
Other Materials

Release to Library: Yes ☐ o ☐

Q.1 You have been asked to design an **interactive kiosk system** to support a **bike rental** scheme in Galway in support of the city's efforts to become more environmentally conscious. The system will operate similarly to those deployed in other large European cities (Dublin, Barcelona, Brussels, etc.) which facilitate short journeys within the city: i.e. bicycles are kept at a number of parking stations throughout the city, and members of the public can borrow a bicycle at any time and return it to any parking station after use. The system design must be robust enough for public settings, enable user data input (user details etc.) and payment details (credit card: a deposit amount to cover damage or theft of bike will be frozen on the card); it should also provide maps of interest and identify bike-drop-off points and general bike availability.

Your company has indicated that they want an initial, early design submission from you to include the following:

(a) A PACT analysis for this application.

[5]

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

[9]

(c) An evaluation plan, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken, for the system which will support comprehensive testing of your design.

[6]

Q. 2. (a) Given that good design is dependent on good designers, not expensive tools, comment on the role of **software tools** in interaction design. Support your answer with relevant examples.

[8]

(b) HCI incorporates the study of novel interaction techniques with technology. Current interactions largely rely on vision (screen presentation of information) and touch (keyboard, touch-screens, etc.). You have been asked to propose a new interactive technique for a system being developed for use in a busy scientific laboratory environment. Prepare a memo outlining the shortcomings of traditional interaction in this context, and proposing the benefits of this new interactive technique (including successful examples of its application in other contexts) to be presented to your company's management team.

[7]

(c) What makes something easy to use? What are the properties of an interactive system that make it easy to use for beginners to intermediate and expert users?

[5]

Q. 3. (a) Design principles are intended to cover all interactive systems. Their generalisability is both their strength and weakness. Discuss the role of design principles in developing good interactive **web-based systems**. In your answer consider the importance of context in the application of these principles.

[9]

(b) Comment on the efficacy of *Anthropomorphism* in interactive system design.

[5]

(c) Choose an appropriate evaluation method for each of the following situations. In each case identify: the participants, the technique used, the representative tasks to be examined, measurements that would be appropriate, and an outline plan for carrying out the evaluation.

(i) You are designing a new web-based project management application and you wish to test what type of icons will be easiest to learn.

(ii) You have an idea for a new parking control system to be used by staff and students of NUI, Galway to reduce search time for a vacant car park space, and resulting traffic congestion on campus.

(iii) You have designed and implemented a new game application for the iPhone and want to evaluate it before release.

[6]

Q. 4. (a) EZ-Pal is your friendly mobile companion. EZ-Pal moves from your alarm clock to your mobile phone to your TV. EZ-Pal helps you with things such as recording your favourite TV programme, setting the security alarms, heating and lighting on your house, remembering your shopping list and remembering special days such as birthdays. Discuss the **design issues** that EZ-Pal raises and outline a conceptual model for the design.

[9]

(b) Write a one-page memo to your colleagues in your software design company, proposing the adoption of more rigorous user goal evaluation during design to improve the success of the interactive systems designed by your company.

[5]

(c) In designing an interactive application, the ***posture*** of the application should be appropriate for the user task. Describe the three different application ***postures*** and how each ***posture*** informs the resulting interaction design, paying specific attention to the design of error messages.

[6]

Ollscoil na hÉireann, Gaillimh *GX____*
National University of Ireland, Galway

Semester I Examinations 2008/2009

Exam Code(s)	3IF121; 3BA 1SD1
Exam(s)	B.Sc. in Information Technology B.A. Higher Diploma in Software Design and Development
Module Code(s)	CT318 CT865
Module(s)	Human Computer Interaction
Paper No.	1
Repeat Paper	_____ Special Paper _____
External Examiner(s)	Professor John A. Keane Professor Sally McClean
Internal Examiner(s)	Prof. G. Lyons Ms. K. Young
Instructions:	Answer any **three** questions. All questions will be marked equally.
Duration	2hrs
No. of Answer Books	1
Requirements:	_____
Handout	_____
MCQ	_____
Statistical Tables	_____
Graph Paper	_____
Log Graph Paper	_____
Other Material	_____
No. of Pages	3
Department(s)	Information Technology

Q.1 You have been asked to design an interactive web-based learning environment for children to support their development of effective literacy and numeracy skills. The system must be appealing and fun to use, engage the children, and enable navigation by a variety of means (e.g. by topic, or through sequential lessons, or by activity).

The site must also store the children's details, greet them when they enter, store a record of their performance on various games and tasks, and recommend areas for further attention. The system is competing against a variety of commercial gaming platforms (Vtech, Nintendo DS, Sony PlayStation, Microsoft Xbox ,etc.) and so must be very well designed to appeal to its audience.

The company has indicated that they want an initial design submission from you to include the following:

(a) A PACT analysis for this application.

[5]

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make (e.g. interaction styles).

[9]

(c) An evaluation plan, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken, for the system which will support comprehensive testing of your design.

[6]

Q. 2. (a) Effective requirements collection and analysis is critical to the design and development of a successful interactive system. You have been asked to comment on the efficacy of standard requirements documentation techniques for representing interactive system requirements to a quality review group within your organisation. Your response should include examples to illustrate your arguments, as appropriate.

[8]

(b) You have been asked to design a remote control device that can be used to control the lighting, heating, curtains/blinds in the lecture theatres and classrooms on the NUI, Galway campus. Prepare a prototype design, outlining the design principles you found relevant in solving this problem.

[8]

(c) Using appropriate examples, explain Norman's *gulf of execution* and *gulf of evaluation* as they relate to successful interaction design.

[4]

Q. 3. (a) Effective interaction design is ultimately about the correct assignment of responsibilities to the parties participating in the interaction, i.e. the human and the computer. From your study of the various theories, models, processes, and techniques of interaction design, comment on the validity of the above statement, illustrating your response with appropriate examples as necessary.

[10]

(b) Which interaction style would you apply to the design of each of the following and why?

- An online TV licence system
- An interactive restaurant menu system
- An interactive water testing system (probe)

[6]

(c) You have been tasked with evaluating the efficacy of your organisation's website. Where would you start? Outline a brief plan for undertaking this evaluation.

[4]

Q. 4. (a) (i) Distinguish between Conceptual and Physical Design.

(ii) You have been tasked with developing a website for a local hotel chain. Outline the progression from Conceptual to Physical Design in this context, clearly identifying the inputs and outputs for each design phase.

[10]

(b) HCI research incorporates the study of novel interaction techniques with technology. Current interactions largely rely on vision (screen presentation of information) and touch (keyboard, touch-screens, etc.), with aural (voice recognition), emotion (biosensors), and physical movement all being researched as possible interactive techniques for future everyday computer applications. Drawing on your learning and readings in this course, comment on the potential of these new interactive techniques to "replace" the current dominant desktop / direct manipulation GUI in the next five years.

[10]

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Autumn Examinations 2007/2008

Exam Code(s)	3IF121; 3BA 1SD1
Exam(s)	B.Sc. in Information Technology B.A. Higher Diploma in Software Design and Development
Module Code(s)	CT318 CT865
Module(s)	Human Computer Interaction
Paper No.	1
Repeat Paper	_____ Special Paper _____
External Examiner(s)	Professor John A. Keane Professor Sally McClean
Internal Examiner(s)	Prof. G. Lyons Ms. K. Young
Instructions:	Answer Question One and **two other** questions. All questions will be marked equally.
Duration	2hrs
No. of Answer Books	1
Requirements:	_____
Handout	_____
MCQ	_____
Statistical Tables	_____
Graph Paper	_____
Log Graph Paper	_____
Other Material	_____
No. of Pages	3
Department(s)	Information Technology

1. You have been asked to design an interactive web-based system for an airport food hall. The system must support the user in browsing, ordering and payment. Payment for different vendors within the one order are processed separately for each vendor, but together as one bill for the customer. Users can order in advance, i.e. before travelling, or before disembarking from plane, and notify the system of an expected collection time. Your client has stressed the importance of an effective, easy to use, and well-organised interface for their users, given the time pressures customers face.

The company has indicated that they want an initial design submission from you to include the following:

(a) A PACT analysis for this application.

[5]

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make.

[9]

(c) An evaluation plan, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken, for the system which will support comprehensive testing of your design.

[6]

2. Write a detailed description of **three** of the following subjects, illustrating your answer with practical examples where relevant:

Internationalisation in UID
Norman's Interaction Model
Affective Computing
Advances in Non-Visual Interaction
Usability Testing

[20]

3. (a) Design principles are intended to cover all interactive systems. Their generalisability is both their strength and weakness. Discuss the role of design principles in developing good interactive systems. In your answer consider the use of these principles in all designs: how important is context in the application of these principles?

[9]

(b) Write a one-page memo to your colleagues in your software design company, advocating the requirement to incorporate physiological data collection in all interactive product evaluations from a future date.

[5]

(c) Which interaction style would you apply to the design of each of the following and why?

- A mobile Diabetes Monitoring Device
- A Galway Events Ticketing Machine
- A Diary Management System for Mobile and Desktop Use

[6]

4. (a) You have been tasked with developing a prototype UI (User Interface) for your company's new home entertainment system. The brief highlights the need to minimise users' negative emotions (frustration, fear, anger, etc.) when using this new system. Discuss the design issues that this new UI raises, and outline a conceptual model for the design.

[10]

(b) What factors can be used to distinguish different evaluation techniques and help the interactive systems designer choose an appropriate method for evaluating their designs?

[5]

(c) Distinguish between a *conceptual model* and a *prototype*.

[5]

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Semester I Examinations 2007/2008

Exam Code(s)	3IF121; 3BA 1SD1
Exam(s)	B.Sc. in Information Technology B.A. Higher Diploma in Software Design and Development
Module Code(s)	CT318 CT865
Module(s)	Human Computer Interaction
Paper No.	1
Repeat Paper	Special Paper
External Examiner(s)	Professor John A. Keane Professor Sally McClean
Internal Examiner(s)	Prof. G. Lyons Ms. K. Young
Instructions:	Answer any **three** questions. All questions will be marked equally.
Duration	2hrs
No. of Answer Books	1
Requirements:	
Handout	
MCQ	
Statistical Tables	
Graph Paper	
Log Graph Paper	
Other Material	
No. of Pages	3
Department(s)	Information Technology

1. You have been asked to design an interactive web-based system for a clothing company who wish to begin selling their sports clothing online. The system must support the user in browsing through their products by different categories (e.g. Men / Women / Children; type of sport; price category etc.), down through subcategories to the product level detail where attributes such as size, colour, and available stock/inventory levels are specified.

The site must also enable customers to search for a particular product, put it in their shopping cart and fill in their address details for shipment as well as paying for the product. Your client has stressed the importance of an effective, easy to use, and well-organised interface for their users, given the level of competition in the market.

The company has indicated that they want an initial design submission from you to include the following:

(a) A PACT analysis for this application.

[5]

(b) A paper prototype of three of the interface screens, representing the system's functional organisation and overall "look and feel". Clearly outline your rationale for each of the design choices you make.

[9]

(c) An evaluation plan, clearly outlining what activities, when, how and by whom the evaluation activities will be undertaken, for the system which will support comprehensive testing of your design.

[6]

2. Write a detailed description of **three** of the following subjects, illustrating your answer with practical examples where relevant:

Internationalisation in UID
Interaction Design Principles and Guidelines
Anthropomorphism in UID
UID for Mobile Devices
Cooperative Evaluation

[20]

3. (a) Good design requires good designers, not expensive tools. Comment on the validity of this statement and what it means for interaction design education. Support your answer with relevant examples.

[8]

(b) Write a one-page memo to your colleagues in your software design company, proposing the adoption of more rigorous task analysis during design to improve the success of the interactive systems designed by your company.

[6]

(c) Which interaction style would you apply to the design of each of the following and why?

- An online music download site.
- An interactive ticketing machine for public transport.
- A hospital facilities management system: facilities to include all non-medical equipment and supplies.

[6]

4. (a) Research in human computer interaction has identified two distinct approaches to this cooperative interaction: the human centred and machine centred view. Norman characterises the differences in these approaches as those between analogue and digital agents. Do you agree with this statement? Why? What does this mean for effective interaction design? Use examples to illustrate your response.

[10]

(b) What makes something easy to use? What are the properties of an interactive system that make it easy to use? Modify your list to make it specific to an ageing population.

[5]

(c) Using appropriate examples, explain Norman's *gulf of execution* and *gulf of evaluation* as they relate to successful interaction design.

[5]