

S211C/303C, S228/303C, S8900/303C



DUBLIN INSTITUTE OF TECHNOLOGY

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**DT211C BSc. (Honours) Degree in Computer Science  
(Infrastructure)**

**Year 3**

**DT228 BSc. (Honours) Degree in Computer Science**

**Year 3**

**DT8900/1 International Pre Masters for MSc in  
Computing**

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**SUMMER EXAMINATIONS 2015/2016**

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**UNIVERSAL DESIGN AND ASSISTIVE TECHNOLOGY  
[CMPU3046]**

DR JOHN GILLIGAN  
DR. DEIRDRE LILLIS  
MR. THOMAS NOLAN  
MR KEVIN FOLEY

WEDNESDAY 18<sup>TH</sup> MAY

9.30 A.M. - 11.30 A.M.

DURATION 2 HRS

INSTRUCTIONS TO CANDIDATES

ANSWER **QUESTION ONE** AND ANY **TWO** OTHERS.

QUESTION ONE CARRIES 30 MARKS, ALL OTHERS CARRY 35 MARKS

1: a) Define in your own words what is meant by Universal Design and give **three** reasons why your definition is a good one.

(10 Marks)

b) Describe, with examples, any three principles of Universal Design. Demonstrate the difficulties which can occur, if your chosen principles are not followed.

(6 marks)

c) Design a microwave oven according to the principles of Universal Design. Describe and justify your design choices with particular respect to control attributes, audio cues and gripping and lifting features.

(14 marks)

2:

a) Why do speech synthesis voices typically sound so robotic?

(5 marks)

b) Compare and contrast parametric and concatenative speech synthesis under the headings

- How they synthesize speech;
- The naturalness of the output;
- The intelligibility of the output.

(10 marks)

c) What do screen readers do? Who uses them and what are the main challenges they face when using them to access the internet?

(10 marks)

d) How do screen readers deal with the following issues?

- Acronyms
- Images
- Hotspots- (i.e. web-links behind parts of pictures)

(10 Marks)

3

a) How is inclusion compromised with bad design choices? Give two examples.

(8 marks)

b) Mary is taking several distance learning courses in physics. She is deaf. She had little trouble with the curriculum until the university upgraded their on-line courseware to a multimedia approach, using an extensive collection of **audio lectures**. Describe three potential difficulties she may face and suggest remedies in each case.

(13 Marks)

c) Taking any two principles of UD show how Mary's situation would have been improved if these had been followed.

(7 marks)

d) How would you convince the course managers to use UD in the design of new materials.

(7 marks)

4.

a) What are the **four** main principles around which the Web Content Accessibility Guidelines 2.0 are arranged?

(8 marks)

b) Describe **two** difficulties that switch access users have in accessing the Web.

(8 marks)

c) Why, briefly, is it necessary to provide text alternatives for non-text content and why is this a key principle of the Web Content Accessibility Guidelines?

(6 marks)

d) What alternative text would you provide for the image, Fig 1 in the following contexts.

- The text in the image is not contained anywhere in the text surrounding the image
- The text in the image is included in the text surrounding the image

In each case justify your alternative text.

(13 Marks)

Fig 1

