NEW ZEALAND INSTITUTES OF TECHNOLOGY AND POLYTECHNIC QUALIFICATIONS IN INFORMATION & COMMUNICATIONS TECHNOLOGY

PRESCRIPTION: ID500 INTERFACE DESIGN AND DEVELOPMENT

AIM OF MODULE:	Students will gain an understanding of the knowledge and skills required for interface design and development.
CREDITS:	7
STUDENT LEARNING HOURS:	70
CONTENT REVISED:	2004
PRESCRIPTION EXPIRY DATE:	Nov 2011

Level and Assessment Schedule

TOPICS	Highest Skill Level R	C	A	P	Suggested Assessment Percentage
1. Interface Design Theory		*			20
2. Interface Mechanisms		*			30
3. Development of interface design prototypes using a tool			*		35
4. Interface Design Research Methods				*	15
					100

LEARNING OUTCOMES

The student will:

C	1	Describe major interface design principles and give examples of how these principles should be applied
C	2	Demonstrate familiarity with interface mechanisms and identify appropriate and inappropriate uses of interface mechanisms, and given a software system requirement, develop a written user interface design, and describe how an application should deal with errors and exception conditions.
A	3	Use a tool to develop interface design prototypes, including creation of a standard menu system, and given a software system requirement, create prototypes of dialog boxes and input screens.
P	4	Demonstrate familiarity with interface design research methods by conducting a statistical analysis of sample data and critically interpret the result of an interface design research project.

CONTENT

1 INTERFACE DESIGN THEORY

Major interface design principles, as derived from "About Face: The Essentials Of User Interface Design" by Alan Cooper, 1995, IDG Books. ISBN 1 56884 322 4. Extracts from this work can be found at http://www.cooper.com.

- Examples of how interface design principles should be applied including items such as:
  - The software user goals
  - The difference in needs of Beginners, Intermediate Users and Expert Users
  - The difference between Implementation Models, Mental/Conceptual Models and Manifest Models
  - The Canonical vocabulary of GUI
    - GUI Primitives
    - GUI Compounds
    - GUI Idioms
  - Basic Cognitive Mechanisms relevent to Interface Design
    - The importance of visual patterns
    - The use of metaphor
    - The use of software idioms
    - Manual Affordances
  - The place of Standards

2 INTERFACE DESIGN MECHANISIMS

- Coverage of appropriate and inappropriate uses of Interface mechanisms should include the following issues:

  - Choosing between Main Windows and subordinate windows
  - Filing System dialogs, Storage and retrieval systems
  - Programme orchestration and flow
  - Mechanisims for communicating programme Posture and State
  - Avoiding interaction Overhead and Idiocy
  - Decision set streamlining and preference thresholding
  - Point and Click Interactions
  - Selection Interactions
  - Direct Manipulation
  - Drag and Drop Interactions
  - Dialog Boxes
    - Types of dialog boxes
    - Dialog Box Etiquette
  - Toolbars
  - About Boxes

- A written user interface design which uses appropriate interface mechanisims should include items such as:

  - Use of modal or modeless dialogs
  - Provision of dialog box sizing
  - The border type to use
  - Use of panels in the design
  - The position of dialog box when they are initially invoked
  - The position of dialog box when they are subsequently invoked
  - What dynamic information, if any, is to be put in the title on the caption bar
  - How mouse cursor hinting is to be used
  - The tab order of controls
  - The effects of the terminating buttons
  - Provision of a ‘default’ control
  - Provision of a ‘cancel’ control
  - Support for keyboard operations and provisions of shortcut keys
  - Justification for the choice of input controls
  - Specification of an initial state for each control when the dialog is opened ie. data displayed within each control or use of enabling an disabling of controls
  - Specification of information which is to be saved when the dialog is closed
  - Provision of hints/tooltips.

- Different methods of how an application should deal with errors and exception conditions.

3 INTERFACE DESIGN PROTOTYPES

- A standard menu system including items such as:

  - Top line menu
  - Conventional grouping
  - Specialised menu

- A software system requirement to create prototypes of various dialog boxes and input screens, and should include:

  - Small, non-sovereign program design prototyping
  - error and exception dialog boxes
  - tabbed input screens.

4 INTERFACE DESIGN RESEARCH METHODS

- Conduct a statistical analysis of sample data using appropriate Exploratory Data Analysis (EDA) techniquies.

- Critically interpret the result of a report on an interface design research project.

NOTES

- For 3 it is assumed that a visual screen design tool (e.g. Access, Delphi, PowerBuilder, Visual Basic) is used. The prototyping must include appropriate visual components placed on a screen with design time component attributes and options set as necessary. NO coding beyond that generated by the design tool is required.

- It is recommended that students participate in an Interface Design experiment which gathers data comparing different software design solutions. This data can then be used as the basis for the exercises outlined in 4.