

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

PRESCRIPTION: DT500 DATA ORGANISATION

AIM OF MODULE:	Students will gain an understanding of the techniques used to represent data, of fundamental data types and data organisation, and how data is manipulated, stored and accessed in typical data processing systems.
CREDITS:	7
STUDENT LEARNING HOURS:	70
CONTENT REVISED:	2010
PRESCRIPTION EXPIRY DATE:	November 2013
NOTE:	THIS IS A COMPULSORY DIPICT L5 MODULE

Level and Assessment Schedule

TOPICS	Highest Skill Level				Suggested Assessment Percentage
	R	C	A	P	
1. Number Systems			*		35
2. Coding Systems			*		20
3. Data Characteristics		*			15
4. Data Structures		*			10
5. Data Organisation		*			20
					<hr/> <hr/> 100 <hr/> <hr/>

LEARNING OUTCOMES

The student will:

- | | | |
|---|---|--|
| A | 1 | Use appropriate (manual) mathematical techniques to convert between different number systems, perform calculations and describe the concepts of error propagation and will utilise techniques that ensure that errors are minimised. |
| A | 2 | Describe different coding systems and design an appropriate classification structure for a given business situation. |
| C | 3 | Define the term “data” and identify appropriate data types for a variety of uses. |
| C | 4 | Describe a variety of the most common internal data structures and the operations that may be performed on them. |
| C | 5 | Describe a variety of file and database structures, the operations which may be applied to them and describe file and database management and identify any differences. |

CONTENT

It is expected that the terminology discussed during this module will be adjusted as needed to conform to the current ICT environment.

1 NUMBER SYSTEMS

- Basic number systems such as binary, octal, decimal, hexadecimal.
- Conversion between number systems.
- Addition and subtraction in base number systems other than decimal, including an explanation about complementary arithmetic.
- Different methods of storing and performing arithmetic on numbers, including whole numbers, fractions and negative numbers; e.g. integer, packed decimal, floating point, and fixed point

2 CODING SYSTEMS

- Characteristics of coding systems including collation sequence and special characters. Systems such as ASCII, EBCDIC, and Unicode should be referred to.
- Code development process including structure, check-digits, and choice of numeric vs alphanumeric, sequential vs meaningful. Examples of current coding systems for reference could include cheque account numbers, hotel rooms, telephone numbers, bar codes.
- Efficiency of coding systems for human use, computer use, and data capture.

3 DATA CHARACTERISTICS

- Data types available in commonly used programming languages and databases; e.g. integer, single, alphanumeric, date, char, boolean, comp-3, currency (include types which may be encountered during student's study of other DiplCT modules).
- Common terms for data storage and manipulation, such as digit, character, field, primary key, record, file, attribute, row, column, cell, tuple, table, database, class object, Object ID, method, add, change value, amend, edit, format, insert, delete, rename, display, print, protect, alter structure, data model, and data dictionary.

4 DATA STRUCTURES

- Structures should include those available in commonly used programming languages; e.g. variable, array, stack, queue, list, tree, with operations such as deletion, insertion, and retrieval.

5 DATA ORGANISATION

- File structures such as sequential, relative, random, indexed; database structures such as hierarchical, network, relational, and object oriented.
- Operations such as insert, amend, delete. Sequential and direct access methods.

LEARNING RESOURCES:

Discovering Computers 2011: Complete (First Edition) by Gary B. Shelly & Misty E. Vermaat. ISBN 13: 978-1439079263 (Published by Course Technology; (February 25, 2010)

Web Links:

UPC-A Symbology <http://www.barcodeisland.com/ean13.phtml> (Accessed August 2010)