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

PRESCRIPTION: PP490 PROGRAMMING CONCEPTS AND TOOLS

AIM OF MODULE:	To introduce students to the process of solving simple programming tasks through logic methods, problem decomposition and translation into a programming language.
CREDITS:	7
RESTRICTION:	THIS MODULE CAN NOT BE CREDITED IN ADDITION TO PD500 OR PP400
STUDENT LEARNING HOURS:	70
CONTENT REVISED:	2002
PRESCRIPTION EXPIRY DATE:	November 2013
NOTE:	THIS IS A COMPULSORY DipICT L5 MODULE Students may omit this compulsory module if they have achieved passes in both PD500 and PP400.

Level and Assessment Schedule

TOPICS	Highest Skill Level R	C	A	P	Suggested Assessment Percentage
1. Problem Decomposition and Documentation of Logic			*		10
2. Design of structured logic solutions using sequences, selections and repetition			*		30
3. Desk checks			*		10
4. Translation of logic solutions into a selected programming language			*		45
5. Simple program documentation			*		5
					100

LEARNING OUTCOMES

The student will:

A	1	Apply the techniques of problem decomposition and apply a number of recognised ways to document the logic.
A	2	Demonstrate appropriate use of sequence, selection and iteration to design well structured programs for solving simple tasks.
A	3	Desk check the design using test data.
A	4	Translate simple logic solutions from an appropriate logic diagram into the selected programming language. Compile, resolve syntax errors, test the programs, and modify the programs as required to meet the original design objectives.
A	5	Document source programs to basic level.

CONTENT

NOTE

- It is expected that a depiction method related to the programming language taught in this module will be covered to a greater depth.

1 Two suitable logic depiction methods such as structure diagrams, structured English, and UML may be used.

- Programs need not relate to business data processing but the selection of tasks should introduce design techniques that will be required for typical data processing problems.

- A *maximum* of one level of nesting of selection/iteration is recommended.

- Examples of problems to indicate the level of difficulty:

  - Calculate sum, product, average of series of numbers
  - Conversion of temperatures from Celsius to Fahrenheit
  - Input values and output results with simple calculations

2 Problem solution should be based on whole programs not sub-programs, functions or procedures.

3 Desk checks should be taught as part of the logic depiction method and performed before program code is written.

4 Programming features such as input, output, operations (eg. arithmetic) on data, data storage (not files) should be included.

- The action of individual items of syntax in the selected programming language should be explained. This includes information about any data elements it works with, produces or changes.

- The subset will include logic control, assignment and comparison operators that are required to write programs for this module.

- Examples of suitable languages:

  - Visual Basic
  - Pascal
  - Java
  - Jade

- An integrated programming environment using either a procedural or object oriented language is recommended.

- The student should write the program from the selected logic depiction method and ensure that all original design objectives are met.

5 The source program should be documented with such simple comments as program name, date written, author, purpose of program

NOTES AND COMMENTS

- The intention of this module is to get the student to implement simple problem solutions that they have completed in the logic section of this module, not to produce commercial programs.

- The module requires students to acquire skills in taking the fundamental building blocks of program design (selection, iteration and sequence) and applying these to simple problems. The vehicle for testing the resulting procedures will be the selected programming language. Equal assessment is to be given to both program design and the ability to translate that design into the selected language.

- The training provider should ensure that the appropriate mix of theory and practical application is maintained throughout the teaching of this module. Theory should be re-enforced with practical, **not** treated as a separate topic.