Level 4 Certificate in Computer Fundamentals (105)
115 Credits

Unit: Introduction to Programming **Paper No.:** 2	**Guided Learning Hours:** 200 **Number of Credits:** 20
Prerequisites: Basic computing knowledge.	**Corequisites:** A pass or higher in Certificate in Information Systems or equivalence.
Aim: This unit give learners an overview of the different components of the computer, different numbering systems, conversions and problem-solving strategies. Learners learn about the different programming languages in the market, how programs are written and evaluated. The unit examines the flowchart diagram presentation, basic issues related to program design and implementation. Major topics include logic\looping (endless loops, loops repeated a certain number of times, conditional loops); control structures (the IF statement, variations of IF statements and programming syntax. Other topics include mathematical expressions, conditional expressions, syntax, run-time and logical errors.	
Required Materials: Recommended Learning Resources.	**Supplementary Materials:** Lecture notes and tutor extra reading recommendations.
Special Requirements: The unit requires a combination of lectures, demonstrations, discussions, and hands-on labs.	
Intended Learning Outcomes:	**Assessment Criteria:**
1 Computer organisation and the role of general purpose computers.	1.1 Describe computers components 1.2 Describe computers startup process 1.3 Describe how computers are organised internally 1.4 Describe the iteration of CPU, memory and storage.
2 Bits, data representation techniques and computer arithmetic algorithms.	2.1 Describe data types 2.2 Describe the different numbering systems (decimal, binary, octal and hexadecimal) 2.3 Explain binary addition, subtraction and addition 2.4 Discuss the limitations of integer representation 2.5 Define real/floating point numbers 2.6 Define pure text (ASCII) representation
3 Programming steps, syntax, terminology and the different types of programming languages.	3.1 Discuss the meaning of programming 3.2 Explain high and low level programming languages 3.3 Define variables and data types 3.4 Describe the purpose of business programming languages 3.5 Analyse the functions of a programmer.
4 Understand programming design layout, problem solving and debugging process.	4.1 Describe sequential control structures 4.2 Illustrate how to implement conditional control structures 4.3 Describe iteration control structures. 4.4 Demonstrate looping and exiting the loop 4.5 Demonstration selection control structures

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5 Problem solving, flowcharting symbols, diagramming techniques and pseudocode structured algorithms.	5.1 Describe control structures 5.2 Demonstrate creating control structure flowchart diagram format 5.3 Use flowchart diagrams to illustrate iteration and selection 5.4 Demonstrate how to dry run flowchart diagrams
6 Understand how to creating and running simple computer programs in QBasic.	6.1 Demonstrate how to perform simple arithmetic operations 6.2 Formulate dependencies between quantities using variable expressions 6.3 Demonstrate how to turn mathematical expressions into programs 6.4 Describe program syntax errors 6.5 Describe program run-time errors 6.6 Describe program logical errors 6.7 Demonstrate programming development steps
7 Understand the varies components of a computer program including the native data types, instructions, registers, addressing modes, memory architecture.	7.1 Define a function 7.2 Illustrate the compositions of a function 7.3 Describe the scope of a variable 7.4 Describe interrupt and exception handling 7.5 Explain external I/O
8 Conditional expressions, evaluation rules in test and Boolean operations.	8.1 Describe Boolean operations 8.2 Demonstrate how to test conditions 8.3 Demonstrate conditional expressions
Methods of Evaluation: A 2-hour written examination paper with Section A and Section B. Section A has 40 multiple choice questions. Section B has three essay questions, each carrying 20 marks. Candidates are required to answer all questions. Candidates also undertake project/coursework in Introduction to Programming with a weighting of 100%.	

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Recommended Learning Resources: Introduction to Programming

Text Books	• How to Design Programs: An Introduction to Programming and Computing by M Felleisen. ISBN-10: 0262062186 • You Can Do It: A Beginner's Introduction to Computer Programming by Francis Glassborow. ISBN-10: 0470863986 • Absolute Beginner's Guide to Programming by Greg Perry. ISBN-10: 0789729059
Study Manuals 	BCE produced study packs
CD ROM 	Power-point slides
Software 	None