LONDON CAPITAL COMPUTER COLLEGE

Diploma in Programming (601) – C Programming

Prerequisites: Basic programming skills or basic knowledge of computer use.	**Corequisites:** A pass or higher in Diploma in System Design or equivalence.
Aim: The course illustrates the basic element of C Programming language. Interactive programming exercises are used in class to enable candidates understand the components of the C Program and the syntax of C commands. Candidates must be able to write portable C programs and understand how C programs use memory to store data; describe the syntax rules governing expressions and statements in C and how to use expressions and statements. Candidates must be able to implement facilities from the standard library.	
Required Materials: Student study materials	**Supplementary Materials:** Recommended textbooks and lecture notes.
Special Requirements: This is a hands-on course, hence practical use of computers is essential. Requires intensive lab work outside of class time.	
Intended Learning Outcomes:	**Assessment Criteria:**
1. Describe C programming basics, preprocessor directives, comments, main, printf and scanf functions. Identify different types of variables.	1.1 Demonstrate how to write simple computer programs in C 1.2 Describe how to use simple input and output statements 1.3 Familiarise with fundamental data types 1.4 Illustrate computer memory concepts 1.5 Demonstrate how to use arithmetic operators 1.6 Describe the precedence of arithmetic operators 1.7 Demonstrate how to write simple decision making statements
2. Identify the order in which computer programs are executed. Define selection statements.	2.1 Describe basic problem solving techniques 2.2 Develop algorithms through the process of top-down, stepwise refinement 2.3 Use the `if` selection statement and `if...else` selection statement to select actions 2.4 Use the `while` repetition statement to execute statements in a program repeatedly 2.5 Describe the counter-controlled repetition and sentinel-controlled repetition 2.6 Describe structured programming; 2.7 Describe how to use the increment, decrement and assignment operators.
3. A loop is a set of instructions the computer executes repeatedly until some terminating condition is satisfied. Analyse the different ways of programming repetition statements.	3.1 Demonstrate how to use the `for` and `do...while` repetition statements 3.2 Describe multiple selection using the `switch` selection statement 3.3 Identify how to use the `break` and `continue` program control statements 3.4 Describe how to use the logical operators.

4. Discuss functions. Define how to invoke and call a function.	4.1 Describe how to construct programs modularly from functions 4.2 Outline the common math functions available in the C standard library 4.3 Illustrate how to create new functions 4.4 Describe the mechanisms used to pass information between functions 4.5 Describe simulation techniques using random number generation 4.6 Illustrate how to write and use functions that call themselves.
5. Define an array. Differentiate variables and arrays.	5.1 Describe the array data structure 5.2 Describe the use of arrays to store, sort and search lists and tables of values. 5.3 Demonstrate how to define an array, initialise an array and refer to individual elements of an array 5.4 Demonstrate how to pass arrays to functions 5.5 Describe basic sorting techniques 5.6 Define and manipulate multiple subscript arrays
6. Define pointers. Describe the values that can be initialised to a pointer.	6.1 Describe how to use pointers 6.2 Describe how to use pointers to pass arguments to functions using call by reference 6.3 Describe the close relationships among pointers, arrays and strings 6.4 Describe the use of pointers to functions 6.5 Define and use arrays of strings.
7. Define file processing. Understand the sequential-access file system in C.	7.1 Describe how create, read, write and update files; 7.2 Familiarise with sequential access file processing 7.3 Familiarise with random-access file processing

Recommended Learning Resources: C Programming

Text Books	• The C Programming Language by Brian W. Kernighan and Dennis Ritchie. ISBN-10: 0131103628 • Absolute Beginner's Guide to C by Greg Perry. ISBN-10: 0672305100 • C Programming by KN King. ISBN-10: 0393979504
Study Manuals 	BCE produced study packs
CD ROM 	Power-point slides
Software 	C Programming Language