Revised: 06/2021

COURSE STRUCTURE

Name of Course: PROGRAMMING FUNDAMENTALS

Course Code: DCS1101

Credit Hours: 4

Prerequisite/co-requisite: None

Summary:

This course aims to introduce students to the concepts of structured programming, using C++ language. Students will learn the basic features of programming such as program control structures, functions, arrays, sorting and searching, file and structures. Students will also be exposed to the problem solving process and writing C++ programs to solve problems using a C++ compiler tool.

Course Learning Outcomes:

Upon completing this course, the students will be able to:
CLO1: Build a computer programme using basic logic and operation principles. (P3, PLO6)
CLO2: Assess computer programme solutions based on structured programming concepts. (C3, PLO2)
CLO3: Demonstrate information management and lifelong learning skills in developing new computer programmes. (A3, PLO9)

Course Format:

Total Student Learning Time (SLT) (L = Lecture; T = Tutorial; P = Practical; EL= E-Learning) :					
Learning Hours				**Independent Learning (hr)**	**Total Student Learning Time (hr)**
L	T	P	EL		
28	0	26	14	92	160

Teaching and Delivery Methods/ Teaching Methodology:

Lectures, Tutorial and Practical/Laboratory work delivered in a combination of blended & independent learning

E-Learning provided by INTI makes learning more accessible and convenient for the students. The blended model utilized by INTI is the integration of E-learning via INTI's Learning Management System and the conventional lecturer-led classroom activities. INTI students are required to access to the online learning materials (additional notes, reading materials, online assessments, discussion forums and etc.), so as to acquire a complete learning process. This also promotes self-directed learning in encouraging INTI students to be independent learners.

Syllabus:

	Course Content Outline	**CLO***
1-2	Introduction to C++ programming Concept - Nature of a Computer Program, Categories of Programming Languages, Program Development Life Cycle, Good Programming Practices.	1, 2, 3
3-4	Introduction to Problem Solving and Writing Algorithms - Steps for effective problem solving process, Describing the solutions to problem solving using algorithms such as flowcharts and pseudocodes.	1, 2, 4
5-6	Introduction to C++ programming - C++ environment, structure of C++ program, compile and execute a sample of C++ programs	1, 2, 3
7-8	Basic constructs of C++ - Importance of data types and variables, the primitive data types in C++, the rules in naming variables in C++, the assignment and initialization statement, Boolean, relational, and arithmetic operators, operators precedence	1, 2, 3
9-10	Program Control structure – Sequential structure - simple I/O in C++: cin, cout, cin.getline and getline function	1, 2, 3
11-12	Program Control structure - Selection Structure - Three control structures: Selection structure using if, if-else, nested if-else and switch statements, develop programs using conditional operator	1, 2, 3
13-14	Program Control structure – Looping structure - repetitive structures: while, do-while and for loop; the use of break and continue statement in looping structure	1, 2, 3
15-16	Program Control structure – Looping structure - solve problem using sentinel and counter-controlled program	1, 2, 3
17-18	Modular programming – Functions - Built-in functions: mathematical, characters and strings, the syntax of built-in functions; develop program using built-in functions	1, 2, 3
19-20	Modular programming – Functions - Concept of modular program in C++, types and concept of functions, a programmer-defined functions in C++;	1, 2, 3
21-22	Introduction to Arrays - meaning of array and types of array, declaring and using arrays, accessing arrays elements, pass arrays to functions	1, 2, 3
23-24	Introduction to Searching and Sorting methods - meaning of searching and sorting, types of sorting methods: selection and bubble sort, types of searching techniques: linear and binary search	1, 2, 3
25-26	Introduction to Structures - Meaning of structures, abstract data types, declaring struct types and variables, concept of arrays of structures, passing structure to function	1, 2, 3
27-28	File processing – text file: read and write - Concept of file processing, the syntax of using file processing in C++ ; Opening and closing files, Write file: ofstream, Read file: ifstream, passing file to functions	1, 2, 3

Student Evaluation:

Continuous Assessment		Percentage (%)	CLO
1	Lab Assessment (LA)	20	1
2	Test (T)	10	2
3	Assignment (A)	30	2,3
Total		**60%**	
Final Assessment		**Percentage (%)**	
Final Examination		40	2

Final exam format:
Duration: 2 hours

Students are required to answer FOUR Structured questions. All questions carry equal marks.

Grading Scale:
A+ (90-100), A (80-89), A- (75-79), B+ (70-74), B (65-69), B- (60-64), C+ (55-59), C (50-54), C- (45-49), D (40-44), F (0-39), Resit Pass, RP (50-100), Resit Fail, RF (0-49)

IMPORTANT NOTE:
Students are required to "**PASS**" BOTH continuous and final assessment in order to pass the subject.

Additional Information: COMPUTER LAB, VISUAL STUDIO 2017 OR BLOODSHED DEV-C++

Main Reference(s) Supporting Course:

1. G. Tony (2019). Starting Out with C++ from Control Structures to Objects, 9th edition, Pearson, ISBN: 9780135188651

Additional References:

1. Bjarne Stroustrup (2018). A Tour of C++, Addison-Wesley Professional 2nd Edition, ISBN-13: 978-0134997834
2. Joel Murach(2018). C++ programming,Mike Murach & Associates Inc, ISBN: 9781943872275

LABORATORY WORK:

Lab	Practical Work
1	How to Compile and Run and debug a program. Program Input and output
2	Arithmetic Calculations, Relational, and Logical Operators, Sequential Structure
3	Decision Structures
4-6	Loop Structures
7	File-processing
8-10	Functions
11-12	Arrays
13	Structures