Punjab University College of Information Technology (PUCIT), University of the Punjab

Programming Fundamentals – Spring 2021

(BS-IT-F20 Morning & Afternoon)

Course code	CMP-140
Credit hours	3
Prerequisite	None
Course Instructor	Muhammad Farooq Email: *mfarooq@pucit.edu.pk* Office hours: TBA

Course Objectives

This course is designed as a rigorous introduction to structured programming in C++. The course starts with algorithm designing and problem solving concepts, and then moves on to discuss various programming concepts (i.e. sequence, selection, repetition, functions, arrays, file handling, pointers, structures) in the language C++.

Textbook

- Tony Gaddis, *Starting out with C++: From Control Structures through Objects*, 9th Edition, Pearson, 2018.

Reference Books

- D.S. Malik, *C++ Programming: From Problem Analysis to Program Design*, 5th Edition, Course Technology, 2011.
- P.J. Deitel, H.M. Deitel, *C++ How to Program*, 8th Edition, Prentice Hall, 2012.
- H. Schildt, *C++ from the Ground Up*, 3rd Edition, McGraw-Hill, 2003.
- H. Schildt, *C++: The Complete Reference*, 4th Edition, McGraw-Hill, 2002.

Grading Scheme *(Tentative)*

Quizzes	4-6	17%
Assignments	3-5	8%
Midterm	1	35%
Final	1	40%

Passing Criteria

- Minimum requirement to pass this course is to get overall 50% marks.

Tentative Course Outline and Lecture Plan

Topics	No. of Lectures	Text Book's Chapter #
Introduction, Algorithms and Problem solving	1	1
Algorithms (Selection)	2	
Algorithms (Repetition)	2	
Introduction to C++: cout, insertion operator, Escape sequences, Variables, Identifiers, Data types, ASCII codes, Assignment & initialization, Scope, Arithmetic operators, cin, c-strings, Comments, Named constants	3	2
Arithmetic expressions, Operator precedence and associativity, Type coercion, Type casting, Compound operators, Formatted output, Formatted input: cin.get, cin.getline, cin.ignore, Using library functions	3	3
Selection: Relational operators & expressions, Truth values, if, if-else, nested if, if-else-if, Logical operators, Input validation, Scope, Comparing strings (strcmp), Conditional operator, switch statement	2	4
Repetition: while, do-while, for, Input validation, Sentinel-controlled loops, break, continue, Nested loops	3	5
Midterm Exam		
Functions: Motivation, Defining, Calling, Function prototype, Passing data into functions, Value returning functions, Local and global variables, Static variables, Default arguments, Function overloading, Stubs and drivers	3	6
Arrays: Declaration, Input/output, Bounds checking, Initialization, Processing, Partially filled arrays, Array comparison, Parallel arrays, Arrays as function arguments, Two-D arrays, Arrays of strings, Linear search	4	7, 8
Filing: Text files, Writing data to files, Reading data from files	2	5, 12
Pointers: Introduction, Pointers and arrays, Pointer arithmetic, Pointer comparison, Pointers as function parameters, Pointer and const,	2	9
Pointers: Dynamic memory allocation, Dangling pointers, Memory leak, Dynamic allocation of One-D and Two-D arrays, Returning pointers	2	9
String processing: c-strings, Library functions, string class and its functions	2	10
Structures: Declaration, Accessing and using structure members	1	11
Final Exam		

Important Notes

- **Academic integrity is expected of all students. Plagiarism or cheating in any assessment will result in at least an "F" grade in the course, and possibly more severe penalties.**
- **You bear all the responsibility for protecting your assignments from plagiarism. If anyone else submits your assignment or uses your code in his/her assignment, you will be considered equally responsible and will be punished equally.**
- The instructor reserves the right to modify the grading scheme/marks division and course outline during the semester.
- You are required to use **Microsoft Visual Studio** for writing your code.
- All quizzes will be announced. There is **NO makeup** for a missed quiz, assignment, or homework.