Course Title	Programming Fundamentals	**Course Code**	CS1002
Department	Department of Electrical Engineering	**Campus**	Lahore
Knowledge Profile	Mathematics & Computing (WK2)	**Credit Hrs.**	3+1
Knowledge Area	Computer Science (KA02)	**Grading Scheme**	To be announced by instructor
HEC Knowledge Area	Computing	**Applicable from**	Spring 2023
Pre-requisite(s)	-		

Course Objective	The course is designed as an introductory course on programming, using the imperative core of C++ programming language. The students will learn basic problem solving and algorithm development skills and use them to implement basic C++ programs.

No.	Assigned Program Learning Outcome (PLO)
01	An ability to apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
05	An ability to create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling, to complex engineering activities, with an understanding of the limitations.

I = Introduction, R = Reinforcement, E = Evaluation, A = Assignment, Q = Quiz, M = Midterm, F=Final, L=Lab, P=Project, W=Written Report.

No.	Course Learning Outcome (CLO) Statements	Assessment Tools	Taxonomy Levels	PLO
01	Express a simple algorithm in C++ syntax using basic elements and I/O	Q1, M1	C2	1
02	Practice conditional and/or repetitive control structures to choose among alternative actions and/or execute statements repeatedly.	M1, Q2, A1	C3	5
04	Construct programs modularly from functions	M2, A2	C5	5
05	Use static arrays to represent a uniform collection of data	F, A3	C3	5

Text Book(s)	**Title**	C++ Programming: From Problem Analysis to Program Design, 8th Edition
	Author	D.S. Malik
	Publisher	Cengage Learning
Ref. Book(s)	**Title**	C++ How to Program, 8th Edition
	Author	Dietel and Dietel

Week	Course Contents/Topics	Chapter	CLO
01	**Introduction to Computers** ● History of Computers ● Elements of a Computer System ● The Language of a computer and evolution of Languages ● Processing C++ Program ● Programming with Problem Analysis	1	1
02	**Basic Elements of C++** ● Comments, Special Symbols, Reserved Words, Identifiers, Whitespaces ● Data Types (Simple + Floating Point) ● Arithmetic Operators (including increment and decrement operators), Order of precedence, Expressions, Mixed expressions	2	1
03 - 04	**Variables** ● Allocation memory with constants and variables ● Assignment statement **Input/ Output** ● Insertion and Extraction operator ● Predefined functions for input and output ● Basic file Input and Output	2, 3	1
05 - 06	**Conditional Control Structure** ● Simple if-else ● Relational Operator and simple Data Types ● Boolean expressions ● Order of precedence ● Compound statements ● Multiple selections: Nested if ● Switch structure	4	2
07 - 08	**Repetitive Control Structure** ● While loop structure ● For Loop structure ● Nested Loops	5	2
09 - 11	**Functions** ● Predefined functions ● Simple Functions (no parameters and void return type) ● Value returning function ● Value Parameters ● Reference Parameters	6	3

12 – 14	**Arrays** ● Accessing Array components ● Processing one dimensional arrays ● Array index out of bounds ● Arrays as parameters to functions ● Pointers & Arrays ● Two Dimensional Arrays	8	4
15-16	**C-Strings** ● Declaration ● Reading and writing strings ● Processing C-strings	8	4

*Reference book chapters are given in brackets

Assessment Tools	Weightage
Quizzes (3), Assignments (3)	20%
Sessional Exams (I+II)	30%
Final Exam	50%