Sheikh Zayed Islamic C   entre

University of the Punjab, Lahore
Course Outline

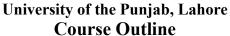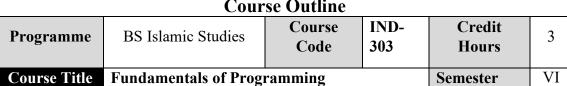| Programme	BS Islamic Studies	Course Code	IND-303	Credit Hours	3
Course Title	**Fundamentals of Programming**			**Semester**	VI

Course Introduction

The objective of this course is to introduce a disciplined approach to Problem-solving methods and algorithm development. The aim is to teach the syntax and vocabulary of a modern programming language like C++. The significant philosophies and logical programming, including models for I/O, processing, and all related terminology will be taught. Simple programs will be constructed, using several different logical, calculations and algorithms.

Learning Outcomes

By the end of the semester, students will have concepts of programming including:

1. Students will develop a strong understanding of the C++ programming language, including its syntax, data types, and control structures. They will be able to write, compile, and debug C++ programs independently.
2. Students will gain the ability to analyze complex problems, design efficient algorithms, and implement solutions using C++. They will learn how to break down problems into smaller, manageable parts and develop algorithmic solutions.
3. By the end of the course, students will have a solid foundation in programming concepts, including variables, data structures (such as arrays and pointers), functions, and control structures. They will be able to design, code, and document software solutions that adhere to best practices in the field of computer programming.

Course Content

Week 1: Introduction to Computer Programs and C++

- Introduction to computer programs, source code, and executable programs
- The compiler

Week 2: History of Programming Languages and C++ Basics

- History of programming languages
- Introduction to C++ language
- Basics of C++ programming language

Week 3: Variables and Operators in C++

- The concept of variable

• Operators and expressions
Week 4: Arithmetic Operators and Expressions   • Arithmetic operators   • Arithmetic operations
Week 5: Comparison Operators and Logical Operators   • Comparison operators   • Logical operators   • Order of precedence
Week 6: Conditional Statements in C++   • The IF statement   • The If-else statement
Week 7: More Control Statements   • Nested if   • The SWITCH statement   • The iteration; FOR Statement
Week 8:   **Mid Term Exam**
Week 9: Iteration with WHILE and DO-WHILE Loops   • The WHILE Statement   • The DO-WHILE Statement   • BREAK & CONTINUE   • Defining an array   • Single-dimensional Arrays in C++   • Using arrays to store data
Week 10: Multi-dimensional Arrays and String Handling   • Multi-dimensional arrays   • String Handling: Basic String Handling Functions   • Character conversions
Week 11: Functions in C++   • Using the Functions: Defining a Function   • Accessing a Function   • Function Prototypes   • Passing Arguments to Function   • Functions & Arrays   • Pass by reference   • Pass by value
Week 12: Pointers and Structures   • Working with Pointers & Structures: What is a Pointer?

• Use of Pointer • Pointers & Functions • Pointers & Arrays
Week 13: Arrays of Pointers • Multidimensional arrays & pointers • Static Initialization of Pointer Arrays • Pointers & Structures • Programs involving text files
Week 14: **Revision**
Week 15: **Presentation**
Week 16: **Final Term Exam**
Textbooks/ Reading Material
1. C++ How to Programme by Dietel and Dietel 2. Behrouz A. Forouzan, "A Structured Programming Approach Using C++".

Teaching Learning Strategies
Throughout the courses, lectures and cooperative learning methods will be used. Students will work in small groups, discuss class readings, emphasize interaction with ideas, and come up with questions that will lead the discussion toward deeper understanding of the readings.
Assignment Types and Numbers
Class Participation, Minor and Major Assignments **Major Assignments:** 1. Analysis of Articles Based on Academic Writing Standards Discussed in the Classroom. 2. Research Proposal Writing

3. Book/Article Review			
Assessment and Examination			
Sr. No.	**Elements**	**Weightage**	**Details**
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Continuous assessment includes Classroom participation, assignments, presentations, viva voce, attitude and behavior, direct activities, short tests, projects, practical, reflections, readings, quizzes etc.
3.	Final Assessment	40%	Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.