National University of Computer & Emerging Sciences, Karachi
Spring2022 CS-Department
CS 1004 – Object-oriented Programming

Course Outline

Week	Topic	Lab Topic
1	Introduction to OO paradigm	Introduction to IDE, skeleton of C++ program, pointers, array, basic I/O in C++
	Comparison from sequential & procedural paradigms	
	Data Abstraction	
2	Encapsulation	C++ data types, functions, struct revisited
	Introductionto Objects in real world	
3	Introduction to classes and objects	Declaring classes &creating objects
	Access Control	
	Constructors & its types	
4	Destructor	Working with classes and constructors (initializing class data members)
	Implicit and explicit casting	
	Member initialization list & constants	
5	Static data and member functions	Access modifiers with data and functions
	Inline functions	
Mid I Exam		
6	Inheritance	Working with constants and member initialization list
	Types of inheritance	
	Data and code hiding	
7	Polymorphism in OOP	Working with static variables and functions
	Function overloading	
	Function overriding	
8	Friend function	Inheritance
	Operator overloading	
9	Multiple inheritance & its issues (Diamond Problem)	Function overloading and overriding
	Virtual inheritance	
	Virtual functions	
10	Abstract class	Friend function, operator overloading
	Interfaces (in C#)	
11	Introduction to filing	Multiple inheritance, virtual keyword, abstract class
Mid II Exam		
12	Generics	Filing and I/O stream
	Introduction to exception handling	
13	Introduction to C#	Working with template functions and template classes
	Properties in C#	
	GUI	
14	Linking window forms	Final lab exam
15	Filing in C#	Project demo
	Exception handling in C#	
Final Exam		

Books:

1- "Problem Solving with C++", 9e Global Edition, Walter Savitch, ISBN-13:9781292018249, Addison-Wesley, 2015.
2- C++ How to program By Deitel&Deitel.

Reference Books:

1- The C++ Programming Language by Bjarne Stroustrup.
2- Object Oriented Software Engineering by Jacobson.
3- C# 4.0: The Complete Reference by Herbert Schildt

Marks Distribution

For Theory:

Assignments	10%
Quizzes	5%
Course Project	10%
Mid Exam	30% (15% each)
Final Exam	45%
Total	**100**

Lab Activities	20%
Lab Mid exam	20%
Course Project	10% (including viva exam & report)
Lab Final Exam	50%
Total	**100**