



National University of Computer & Emerging Sciences, Karachi
Spring 2021 CS-Department
CS 217 – Object-oriented Programming



Course Learning Outcomes (CLOs):

- CLO 1:** Acquire knowledge of underlying concepts of object oriented paradigm like abstraction, encapsulation, polymorphism, inheritance etc.
- CLO 2:** Interpret real world problems in terms of objects rather than procedure.
- CLO 3:** Develop an understanding of Object-Oriented design artifacts and their mapping to Object-Oriented Programming using C++.
- CLO 4:** Apply object-oriented programming principles to implement small and medium scale C++ / C# programs.
- CLO 5:** Implement Generic Programming Concepts and exception handling.

Course Outline:

Wee k	Topic	Lab Topic	Assessment	
1	Introduction to OO paradigm	Introduction to IDE, skeleton of C++ program, pointers, array, basic I/O in C++	Announce project proposals in 2nd week and submissions in 3rd week	
	Comparison from sequential & procedural paradigms			
	Data Abstraction			
2	Encapsulation	C++ data types, functions, struct revisited		
	Introduction to Objects in real world			
3	Introduction to classes and objects	Classes & Objects		
	Access Control			
	Constructors & its types			
4	Destructor	Working with classes and constructors	At least 2 Assignment	
	Implicit and explicit casting			
	Member initialization list & constants			
5	Static data and member functions	Working with access modifiers, static and constant keywords, some examples to revise concepts of classes and objects, constructors & destructors (before Mid 1)		
	Inline functions			
Mid I Exam				
6	Inheritance	Working with Static functions, constants, constant function and member initialization list		
	Types of inheritance			
	Data and code hiding			
7	Polymorphism in OOP	Inheritance		
	Function overloading			
	Function overriding			

8	Friend function	Polymorphism, Function overloading and overriding	At least 2 assignments
	Operator overloading		
9	Multiple inheritance & its issues (Diamond Problem)	Friend classes, Friend functions, operator overloading	
	Virtual inheritance		
	Virtual functions		
10	Abstract classes & Interfaces	Abstract Classes and virtual functions	
11	Introduction to filing	Multiple inheritance, virtual keyword, abstract class	
Mid II Exam			
12	Generics	Project Submission & Project demo	Project Submission in 12 th LAB
	Introduction to exception handling		
13	Introduction to C#	Filing and I/O stream Working with template functions and template classes	
	Properties in C#		
	GUI		
14	Linking window forms & Exception handling in C#	Final lab exam	
15	Revision		Finalized Sessional Marks for both Theory and Labs
Final Exam			

Course Coordinator:

Dr. Abdul Aziz

Course Instructor:

Mr. Syed Zain-ul-Hassan, Mr. Basit Jasani, Mr. Behraj Khan,
Ms. Nida Munnawar, Mr. Qaiser Abbas

Lab Instructor:

Mr. Sohail Afzal, Mr. Qaiser Abbas, Mr. Ali Fatmi, Mr. M. Fahim,
Ms. Romesha, Ms. Nida Munawwar, Ms. Abeer Gouhar

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%
Course Project	10%
Mid Exam	30% (15% each)
Final Exam	50%
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Total	100

For Lab:

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