CS112 Object-Oriented Programming (3 CH)

Pre-Requisite: CS101

Instructor: **Prof. Dr. Zahid Halim**
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Office Hours: 11:00am ~ 12:00 pm

Course Introduction

As a second course on programming, the emphasis would be that students should be able to write a program of reasonable size and complexity. Devising a solution to a problem will be encouraged and converting a design into a computer program would be stressed including the software reuse. The primary aspect of the course is to introduce students with the object-oriented programming skills. This course will provide in-depth coverage of object-oriented programming principles and techniques using C++ 20. Topics include classes, overloading, data abstraction, information hiding, encapsulation, inheritance, polymorphism, file processing, templates, exceptions, container classes, and low-level language features.

Course Contents

Broadly, this course will cover following: Introduction to Classes and Objects, Control Structures, Methods, Arrays, Pointers, Classes Inheritance, Polymorphism, Templates, Exceptions, Files, STL, Operator Overloading, and GUI programming.

Mapping of CLOs and PLOs

Sr. No	Course Learning Outcomes	PLOs*	Bloom's Taxonomy level (Cognitive domain)
CLO 1	Be familiar with and utilize the basic techniques of an object-oriented programming language.	PLO 1	C 2 (Understanding)
CLO 2	Apply programming structures to design solutions for the given problems.	PLO 1	C 3 (Applying)
CLO 3	Apply the major object-oriented concepts to implement programs in C++ using encapsulation, inheritance, and polymorphism	PLO 3	C3 (Applying)
	+Please add the prefix "Upon successful completion of this course, the student will be able to"		

CLO Assessment Mechanism

Assessment tools	CLO_1	CLO_2	CLO_3
Quizzes	30%	20%	20%
Assignments	5%	20%	20%
Midterm Exam	35%	30%	30%
Final Exam	30%	30%	30%

Overall Grading Policy

Assessment Items	Percentage
Quizzes	10%
Project	15%
Assignments	15%
Midterm Exam	20%
Final Exam	40%

Text and Reference Books

Text books:

- Paul J. Deitel and Harvey M. Dietel, " C++20 for Programmers ", 9th Edition, Deitel & Associates, Inc. (2022)

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Administrative Instruction

- According to institute policy, 100% attendance is *mandatory* to appear in the final examination.
- Assignments must be submitted as per instructions mentioned on the assignments.
- In any case, there will be no retake of (scheduled/surprise) quizzes.

- For queries, kindly observe the office hours to avoid any inconvenience.

Computer Usage/Software Tool

- Students are encouraged to solve some assigned homework problems using the available programming software, such as DevC, Visual Studio (using C/C++)

Lecture Breakdown

Week	Contents/Topics
Week 1	User defined data types, Structures, Unions and Enumerations
Week 2	Recursion, Preprocessing in C++
Week 3	Bit Manipulation, Strings, Pointers
Week 4	Reference and Dynamic memory allocation
Week 5	Function Pointers, ADTs and C++ Classes-I
Week 6	C++ Classes-II Constructor, Destructor, Copy Constructor
Week 7	Inheritance, Virtual Functions and Polymorphism
Week 8	Operator Overloading, Function and class templates
Week 9	Exception Handling
Week 10	I/O Streams and File Handling
Week 11	Graphics
Week 12	GUI Programming
Week 13	Introduction to Standard Template Library (STL)
Week 14	Project and case studies
Week 15	STL