CS112	Object-Oriented Programming and Design (3 CH)	Knowledge Profile: WK2	Focus: CCP	All

Pre-Requisite: CS101

Instructor: **Prof. Dr. Zahid Halim**
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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++. 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, and Operator Overloading.

Mapping of CLOs and PLOs

Sr. No	Course Learning Outcomes[+]	WA PLOs[*]	SA 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	Academic Education	C 2 (Understanding)
CLO 2	Apply programming structures to design solutions for the given problems.	PLO 1	Academic Education	C 3 (Applying)
CLO 3	Apply the major object-oriented concepts to implement programs in C++ using encapsulation, inheritance, and polymorphism	PLO 3	Design/ Development of Solutions	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:

- C++20 for Programmers: An Objects-Natural Approach (Deitel Developer Series) 3rd Edition by Paul Deitel, Harvey Deitel. Publication date: April 16, 2022, ISBN: 978-0136905691
- C++ Primer, Stanley B. Lippman, Josée Lajoie, and Barbara E. Moo, 2012, ISBN-10: 9780321714114.

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	GUI Programming
Week 12	GUI Programming
Week 13	Introduction to Standard Template Library (STL)
Week 14	Project and case studies
Week 15	STL