

OBJECT ORIENTED PROGRAMMING THROUGH C++
(Common to CSE & IT)

Course Code	20IT3303	Year	II	Semester	I
Course Category	PC	Branch	IT	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Programming for Problem Solving
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks	100

COURSE OUTCOMES

Upon successful completion of the course, Student will be able to

CO1	Understand the principles of OOP and the key features of C++.	L2
CO2	Apply object oriented concepts to develop solution for the given problem.	L3
CO3	Apply functions as per the problem requirement.	L3
CO4	Analyze the given scenario and use appropriate generic programming aspects / exception handling mechanisms to solve the problem.	L4

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (H:High, M: Medium, L:Low)

	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO1	PSO2
CO1	3												3	3
CO2	3								3	3		3	3	3
CO3	3								3	3		3	3	3
CO4		3							3	3		3	3	3

SYLLABUS

Unit No.	CONTENTS	Mapped CO
I	Introduction: Difference between C and C++, Evolution of C++, Programming Paradigms, Key concepts of OOP, Advantages of OOP, Usage of OOP. I/O in C++: Pre-defined streams, stream classes, Scope access operator, Name space, memory management operators. Functions: Introduction, Parts of a function, Passing arguments, Return by reference, Returning more values by reference, Default arguments, const arguments, Inline functions, Function overloading.	CO1, CO3
II	Classes and Objects : classes in C++, Declaring objects, Access specifiers and their scope, Defining Member Functions, Characteristics of member functions, Outside member function as inline, rules for Inline functions, static member	CO1, CO2, CO3

	<p>variables, static member functions, static objects, object as function arguments, Friend Function.</p> <p>Constructors and Destructors: Constructors and Destructors, characteristics of constructors and destructors, Applications with constructors, Parameterized constructors, Multiple constructors, copy constructors, destructors, calling constructors and destructors.</p> <p>Operator Overloading: The keyword operator, Overloading Unary Operators, Overloading binary operators, Rules for Overloading operators, Overloading Friend function.</p>	
III	<p>Inheritance: Access specifiers and simple inheritance, protected data with private inheritance, Types of Inheritance: Single, Multilevel, Multiple, Hierarchical, Hybrid and Multipath, Virtual Base Classes.</p> <p>Pointers: void pointer, wild pointer, this pointer.</p> <p>Binding, Polymorphism, and Virtual Functions: Binding in C++, Pointer to Base and Derived class, Virtual Function, Rules for Virtual functions, Pure Virtual Functions, Abstract Class.</p>	CO1, CO2, CO3
IV	<p>Files: Introduction, File stream classes, Steps for file operations, Checking for errors, Finding end of file, File opening modes, File pointers and manipulators.</p> <p>Exception Handling: Principles of Exception Handling, The Keywords try, throw and catch, Guidelines for Exception Handling, Multiple catch statements, Catching Multiple Exceptions, Re-Throwing Exceptions, Specifying Exceptions.</p>	CO1, CO2, CO3, CO4
V	<p>Generic Programming with Templates: Need for Templates, Definition of class Templates, Function Template, Working of Function Templates, Class Template with more parameters, Function Template with more parameters.</p> <p>Standard Template Library: Introduction to STL, STL Programming model, containers, sequence container: vector, list; Associative containers: set, map; Algorithms: sort, search, find; Iterators.</p>	CO1, CO2, CO3, CO4

Learning Resources

Text Books

1. *Programming in C++*, Ashok N. Kamthane, 2nd Edition, 2013, Pearson.

References

1. *The C++ Programming Language*, Bjarne Stroustrup, 4th Edition, 2013, Addison-Wesley.
2. *Object-Oriented Programming Using C++ Paperback*, Joyce Farrell, 4th Edition, 2013, Cengage.

e-Resources and other Digital Material

1. <https://www.learncpp.com/>
2. https://onlinecourses.nptel.ac.in/noc21_cs02/preview
3. <https://www.educative.io/courses/learn-object-oriented-programming-in-cpp>
4. <https://www.youtube.com/watch?v=wN0x9eZLix4> (Learn Object Oriented Programming in C++, Beau Carnes, February 2021)
5. <https://www.geeksforgeeks.org/the-c-standard-template-library-stl/>