17CS41O3 - C++ PROGRAMMING (CPP)

(Common to ECE, EEE, CE and ME)

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| **Course Category:** | Open Elective | | **Credits:** | 3 |
| **Course Type:** | Theory | | **Lecture – Tutorial – Practical:** | 2-2-0 |
| **Prerequisite:** | Basics of mathematics and Logic with programming knowledge in C or any Language as optional. | | **Sessional Evaluation:**  **Univ. Exam Evaluation:**  **Total Marks:** | 40  60  100 |
| **Objectives** | * Understanding the basics of C++ features. * Getting awareness of how to create Classes, Object and their implementation. * Learning fundamental ideas about core concepts of Object Oriented Programming. | | | |
| **Course Outcomes** | Upon the successful completion of the course, the students will be able to: | | | | |
| CO1 | Understand the basic terminology and key concepts used in C++. | | | |
| CO2 | Gets the basic idea of how to implement and use of Classes and Objects. | | | |
| CO3 | Acquire the knowledge to identify the importance of Reusability based on inheritance and overloading. | | | |
| CO4 | Ready to use variousforms of Binding and Polymorphism. | | | |
| CO5 | Explore the basic idea and utilization of Generic Programming templates. | | | |
| CO6 | Gain the basic knowledge in core concepts of Standard Template Library. | | | |
| **Course Content** | **UNIT – I**  **Introduction to C++:**Difference between C and C++, Evolution of C++, The Object Oriented Technology, Disadvantage of Conventional Programming, Key Concepts of Object Oriented Programming, Advantage of OOP, Object Oriented Language.  **UNIT – II**  **Classes and Objects:**Classes in C++, Declaring Objects, Access Specifies and their Scope, Defining Member Function, Overloading Member Function, Nested class.  **Constructors and Destructor:**Introduction to Constructors and Destructor, Characteristics of Constructor and Destructor, Application with Constructor, Constructor with Arguments.  **UNIT – III**  **Operator Overloading:** Introduction to Operator Overloading , Rules for Overloading Operators, Overloading Unary Operator ,Overloading Assignment Operator (=).  **Inheritance:**Introduction to Inheritance, Reusability,Types ofInheritance, Advantages of Inheritance,Disadvantages of Inheritance.  **UNIT – IV**  **Binding, Polymorphisms and Virtual Functions:**Introduction to Binding in C++, Static Binding, Dynamic Binding,Introduction to Polymorphisms, Types of Polymorphisms,Introduction to Virtual Functions, Rules for Virtual Function- Virtual Destructor.  **UNIT – V**  **Generic Programming with Templates:**Generic Programming with Templates, Need for Templates, Definition of class Templates, Normal Function Templates, Over Loading of Template Function.  **Exception Handling:**Principles of Exception Handling, Implementation of try, throw and catch,Multiple Catch Statements,Specifying Exceptions.  **UNIT – VI**  **Overview of Standard Template Library:**Overview of Standard Template Library, STL Programming Model, Containers, Sequence Containers, Associative Containers, Algorithms, Iterators, Vectors,Lists, Maps. | | | | |
| **Text Books and References** | **Text Book(s):**  **1.** The Complete Reference C++, Herbert Schildt, TMH.  **Reference Books:**  1.A First Book of C++, Gary Bronson, Cengage Learning.  2.Programming in C++, Ashok N Kamathane, Pearson 2nd Edition. | | | | |
| **E-Resources** | 1. <https://nptel.ac.in/courses> 2. <https://freevideolectures.com/university/iitm> | | | | |