II Year-I Semester		T	P	C
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OBJECT-ORIENTED PROGRAMMING THROUGH C++ (RT21051)

PrerequisiteCourse:

Computer Programming in C

Course Description and Objectives:

Expertise in object oriented principles and their implementation in C++

Course Outcomes:

Upon completion of the course,the student will be able to achieve the following outcomes.

Cos	Course Outcomes	POs
1	Compare C& C++ and explain Object Oriented & I/O streams in C++concepts .	3
2	Describe Operators, Control Structures and functions concepts.	3
3	Discuss classes, Objects and member functions and apply them in C++ programs.	5
4	Apply constructors, destructors, operator overloading and type conversions concepts	4
5	Demonstrate various types of inheritance, polymorphism and virtual functions.	4
6	Explain Files templates and exception handling mechanisms.	5

Syllabus:

UNIT I:

Objective:Exposure to basics of object oriented mode,C++ programming and I/O in C++

INTRODUCTION: Differences Between C And C++, The Object Oriented Technology , Disadvantage of Conventional Programming, Concepts of Object Oriented Programming,Advantages of Oop. Structure of A C++ Program, Header Files and Libraries
INPUT AND OUTPUT IN C++ :Introduction, Streams In C++ And Stream Classes, Pre-Defined Streams, Stream Classes, Formatted And Unformatted Data,Unformatted Console I/O Operations, Member Functions Of Istream Class, Formatted Console I/O Operations, Bit Fields, Flags Without Bit Field, Manipulators,User Defined Manipulators

UNIT II:

Objective: Focus on Basic concept in C++ programming,Operators, control structures , functions, overloading,recursion

Tokens In C++, Variable Declaration and Initialization, Data Types, Operators In C and C++, Scope Access Operator,Namespace, Memory Management Operators, Comma Operator, Revision of Decision Statements, Control Loop Statements
FUNCTIONS IN C++ : Introduction, Structure of Function,Passing Arguments, Lvalues and Rvalues, Retrun By Reference, Returning More Values By Reference, Default Arguments, Const Arguments, Inputting Default Arguments,Inline Functions, Function Overloading,Principles of Function Overloading, Recursion

UNIT III:

Objective: Acquaintance with classes, objects and member functions

CLASSES AND OBJECTS : Introduction, Classes In C++,Declaring Objects, Access Specifiers and Their Scope,Member Functions, Outside Member Function as Inline, Data Hiding or Encapsulation, Classes, Objects and Memory, Static Member Variables, Static Member Functions Static Object,Array of Objects, Objects as Function Arguments, Friend Functions, The Const Member Functions, The Volatile Member Function, Recursive Member Function, Local Classes, Empty, Static And Const Classes, Member Function And Non- Member Function, Overloading Member Functions,Nested Class

UNIT IV:

Objective: Focus on constructors, destructors, variants in them, operator verloading, type onversions

CONSTRUCTORS AND DESTRUCTORS : Introduction,Characteristic of Constructors & Destructors, Applications With Constructors, Parameterized Constructor, Overloading Constructors (Multiple Constructors), Array of Objects Using Constructors, Constructors With Default Arguments, Copy Constructors, The Const Objects, Destructors, Calling Constructors and Destructors, Qualifier And Nested Classes,Anonymous Objects, Private Constructors and Destructors,Dynamic Initialization Using Constructrs, Dynamic Operators and Constructors, Recursive Constructor, Constructor And Destructor With Static Members, Local Vs. Global Object

OPERATOR OVERLOADING AND TYPE CONVERSION : Introduction, Overloading Unary Operators, Constraint on Increment and Decrement Operators,Overloading Binary Operators, Overloading With Friend Function, Overloading Assignment Operator (=), Type Conversion, Rules for Overloading Operators, One Argument Constructor and Operator Function, Overloading Stream Operators

UNIT V:

Objectives: Concentration on inheritance, types of inheritance, polymorphism, virtual functions

INHERITANCE : Introduction, Reusability, Access Specifiers and Simple Inheritance, Protected Data With Private Inheritance, Types of Inheritances(Single Inheritance,
Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Multipath Inheritance),Virtual Base Classes, Constructors, Destructors, and Inheritance, Object as a Class Member, Abstract Classes,Qualifier Classes And Inheritance, Constructor in Derived
Class, Pointers and Inheritance, Overloading MemberFunction, Advantages of Inheritance, Disadvantages of Inheritance.

BINDING, POLYMORPHISM AND VIRTUAL FUNCTIONS: Introduction, Binding In C++, Static (Early) Binding, Dynamic (Late) Binding, Pointer to Base and Derived Class Objects, Virtual Functions, Rules For Virtual Functions, Array of Pointers, Pure Virtual Functions, Abstract Classes, Working of Virtual Functions, Virtual Functions in Derived Classes, Object Slicing, Constructors and Virtual Functions, Virtual Destructors, Destructor and Virtual Functions.

UNIT VI:

Objectives: Focus on Files, File operations, generic programming, templates, function templates, Exception handling

APPLICATIONS WITH FILES: Introduction, File Stream Classes, File Opening Modes, File Pointers and Manipulators,Manipulators With Arguments, Sequential Access Files,
Binary and Ascii Files random Access Operation.

GENERIC PROGRAMMING WITH TEMPLATES : Introduction, Need of Template, Definition of Class Template, Normal Function Template, Working of Function Templates, Class Template With More Parameters, Functions Templates With More Arguments, Overloading of Template Functions, Member Function Templates,Recursion With Template Function, Class Template With Overloaded Operators, Class Template Revisited, Class Templates and Inheritance, Container Classes , Types of Containers,Container Adaptors, Iterators

EXCEPTION HANDLING : Introduction, Principles of Exception Handling,The Keywords Try, Throw and Catch ,Exception Handling Mechanism, Multiple Catch Statements,Catching Multiple Exceptions, Re-Throwing Exception,Specifying Exception, Exceptions In Constructor and Destructors, Controlling Uncaught Exceptions, Class Template With Exception Handling.

TEXT BOOKS:

1. Programming In C++ , Ashok N Kamthane. Pearson 2nd Edition.
2. Object Oriented Programming C++ , Joyce Farrell, Cengage
3. Mastering C ++, Venugopal, Rajkumar, Ravi kumar TMH
4. Object Oriented Programming with C++, 2nd ed, Sourav Sahay, OXFORD

REFERENCE BOOKS:

1. The Complete Reference, C++, 4ed, Herbert Schildt, TMH