Branch: BCA	Semester-II
Subject Code: 2102	Lecture: 04 Credit: 04
Course Opted	Core Course -4
Subject Title	PROGRAMMING METHODOLOGY AND C++

Course Objectives:

- To understand how C++ improves C with object-oriented features.
- To learn how to design C++ classes for code reuse.
- To learn how to implement copy constructors and class member functions.
- To understand the concept of data abstraction and encapsulation.
- To learn how to overload functions and operators in C++.
- To learn how inheritance and virtual functions implement dynamic binding with polymorphism.
- To learn how to design and implement generic classes with C++ templates.

Course Outcomes:

- Students will be able to
- Describe the object-oriented programming approach in connection with C++
- Apply the concepts of object oriented programming
- Analyze a problem and construct a C++ program that solves it
- Discover errors in a C++ program and describe how to fix them
- Illustrate the process of data file manipulations using C++

Module	Sr. No.	Topic and Details	No. of Lectures Assigned	Marks Weightage
UNIT- I	1.	**Evolution of OOP:** Advantages and disadvantages of OOP over its predecessor paradigms. Characteristics of Object Oriented Programming: Abstraction, Encapsulation, Data hiding, Inheritance, Polymorphism, Code Extensibility and Reusability, User defined Data Types. C++Program Structure, Simple Input/ Output Program, Program Comments, Identifiers, Literals, String, Character, Integer, Floating Point, Constants, Keywords, Data Types **Operators in C++, Control Structures in C++**	3	6
	2.	**Advanced Language Constructs:** Arrays, Multi dimensional arrays, Pointers, Structures	3	6
UNIT- II	3.	**Object and Classes :** Core object concepts, Encapsulation, Abstraction, Polymorphism, Classes, Messages Association, Interfaces, Implementation of class in C++, C++ Objects as physical object, C++ object as data types constructor Object as function arguments. **Functions and Variables:** Functions: Declaration and Definition, Variables: Definition,	4	8

		Declaration, and Scope, Dynamic Creation and Derived Data, Arrays and Strings in C++		
	4.	**Inheritance:** Concept of inheritance, Derived class and based class, Types of inheritance, Classes within classes, Functions and Friend Functions **Constructors:** Multiple Constructors and Initialization, Using Destructors to Destroy Instances	8	16
UNIT - III	5.	**Polymorphism:** Syntax for Operator overloading, Overloading unary operations, Overloading binary operators, Data conversion, Pitfalls of operators overloading and conversion keywords.	8	16
	6.	**Memory management:** New and Delete, Pointers to objects, Debugging pointers.	8	16
UNIT-IV	7.	**Files and streams:** iostream hierarchy , Standard Input/output Stream Library, Programming using Streams, Basic Stream Concepts. **File input and output:** Reading a File, Managing I/O Streams, Opening a File – Different Methods, Checking for Failure with File Commands, Checking the I/O Status Flags, Dealing with Binary Files	8	16
	8.	**Class templates:** Implementing a class template, Implementing class template member functions, Using a class template, Function templates, Class template specialization, Template parameters, Static members and variables **Exception Handling:** Try, throw and catch constructs, rethrowing an exception, Catch all Handlers.	8	16
		TOTAL	**50**	**100**

Text Books:

1. E. Balguruswamy, 'Object Oriented Programming with C++', Tata McGraw – Hill Education, 2008
2. K.R Venugopal 'Mastering C++', Tata McGraw-Hill Education, 1997

References:

1. B.Stroustroup 'C++ Programming Language' (3rd Edition). Addison Wesley, 1997
2. B.chandraNarosa 'A Treatise On Object Oriented programming using C++'- Publications, 1998
3. Herbert Schildt, "The Complete Reference CN", Tata McGraw-Hili, 2001