Devi Ahilya University, Indore, India **Institute of Engineering & Technology**				**BE I Year (Common to all branches)** **(Part-Time)**			
Subject Code & Name	**Instructions** **Hours per Week**			**Credits**			
COP2C4:	**L**	**T**	**P**	**L**	**T**	**P**	**Total**
Computer Programming in C++	**2**	**1**	**1**	**2**	**1**	**1**	**4**
Duration of Theory Paper: 3 Hours							

Course Objectives: To provide introduction to problem solving with computers using a modern language C++, Perform object oriented programming and to demonstrate relevance of object oriented programming in developing solutions to engineering problems demonstrating usage of data abstraction, encapsulation, and inheritance, To learn exception handling techniques.

Prerequisites: Nil.

COURSE OF CONTENTS

UNIT-I

Introduction to flowcharts and problem solving. Types of programming languages, Programming with C++:- C++ Data Types:-auto, bool, int, char, float, double, void. Variables and Constants, Operators, Arithmetic and Logical Expressions, Assignment Statements and Type Casting. Control structures- Iteration statements, Jump Statements and Selective statements. Common C++ Header files, Generation of Random numbers in C++.

UNIT-II

Functions: Introduction - Call by Value and Call by Reference – return values – recursion – Arrays - Introduction to Arrays - Initialization of Array - Multi dimensional Arrays - passing arrays to functions – Strings - Arrays of Strings - Standard Library String Functions.

Structures: Structure elements, Nested Structures, Array of Structures, Array within structures and passing structures to functions.

UNIT- III

Pointers:-Declaration and Initialization of Pointers, Dynamic Memory allocation/deallocation operators:- new and delete. Pointers and Arrays:-Array of Pointers, Pointer to an array, Function returning a pointer, Reference variables and use of alias. Invoking functions by passing pointers. Files – Introduction – File Structure - File handling functions - File Types - Error Handling.

UNIT-IV

Object Oriented Programming Paradigm - Basic Concepts of OOP - Benefits of OOP. Class and object fundamentals and various visibility modes in class, Object as function arguments-pass by value and pass by reference. Constructor:-Special Characteristics, Declaration and Definition of a Constructor, Default Constructor, Overloaded Constructor, Copy Constructor and Constructor with default arguments.

Function Overloading:-Need and restrictions of overloaded functions, Steps involved in finding the best match, Default arguments versus overloading.

Destructor:- Special Characteristics, Declaration and Definition of a Destructor. Friend function and its characteristics and friend class.

UNIT-V

Introduction to Operator overloading - Rules for Operator overloading – overloading of binary and unary operators - Introduction to inheritance – Types of inheritance - Abstract Classes - new Operator and delete Operator - Pointers to Objects – this Pointer - Virtual Functions - Pure Virtual Functions - Introduction to Class Templates - Function Templates - Member Function Templates - Basics of Exception Handling - Types of exceptions - Exception Handling Mechanism - Throwing and Catching Mechanism - Rethrowing an Exception - Specifying Exceptions.

BOOKS RECOMMENDED:

[1] Coohoon and Davidson, C++ Program Design: An introduction to Programming and Object- Oriented Design (3rd edition), Tata McGraw Hill, New Delhi, 2003.
[2] Herbert Schildt, the Complete Reference, Tata McGraw Hill.
[3] E Balagurusamy, Object Oriented Programming with C++, McGraw Hill Education.
[4] Ravichandran, Programming With C++, Tata McGraw Hill.
[5] Dromey G, How to solve it by Computer, Prentice Halll – 1978.