# Syllabus

## Object Oriented Programming using C++
## BCA – 16- 204

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**Time Duration : 3 Hrs.**

**External Marks : 65**
**Internal Marks : 10**
**Number of Lectures : 60**

**Objectives :** *By the end of the course, students will be able to write C++ programs using the more esoteric language features, utilize Object Oriented techniques to design C++ programs, use the standard C++ library, and exploit advanced C++ techniques.*

**Note :**

*(i) The Question Paper will consist of Four Sections.*

*(ii) Examiner will set total of NINE questions comprising TWO questions from each Section and ONE compulsory question of short answer type covering whole syllabi.*

*(iii) The students are required to attempt **ONE** question from each Section and the Compulsory question.*

*(iv) All questions carry equal marks unless specified.*

### SECTION–A

**Principles of Object Oriented Programming (OOP):** Introduction to OOP, Difference between OOP and Procedure Oriented Programming; Concepts: Object, Class, Encapsulation, Abstraction, Polymorphism and

Inheritance, Applications of OOP. Special operators: scope resolution operator, Member Dereferencing operators, Memory management operators, Manipulators and Type cast operator

**Structure of a C++ Program and Classes and Objects :** Class Declaration : Data Members, Member Functions, Private and Public members, Creating Objects, Accessing class data members, Accessing member functions; Class Function Definition: Member Function definition inside the class declaration and outside the class declaration.

## SECTION–B

Friend function, inline function, Static members, Function Overloading, Arrays within a class. Arrays of Objects; Objects as function arguments: Pass by value, Pass by reference, Pointers to Objects.

**Constructors:** Declaration and Definition, Types of Constructors, (Default, Parameterized, Copy Constructors). Destructors: Definition and use.

**Operator Overloading & Type Conversion:** Conversion from basic type to user defined type, User defined to basic type and one user defined conversion to another user defined type.

## SECTION–C

**Inheritance:** Extending Classes Concept of inheritance, Base class, Defining derived classes, Visibility modes : Public, Private, Protected ; Types of Inheritance: Single inheritance : Privately derived, Publicly derived; Making a protected member inheritable, multilevel inheritance, multiple Inheritance and ambiguity of multiple inheritance, Hierarchal Inheritance, Hybrid, Nesting of classes.

**Polymorphism:** Definition, Application and demonstration of Data Abstraction, Encapsulation and Polymorphism. Early Binding, Polymorphism with pointers, Virtual Functions, Late binding, pure virtual functions.

## SECTION–D

**Exception Handling:** Definition, Exception Handling Mechanism : Throwing mechanism and Catching Mechanism, Rethrowing and Exception

**File Processing :** Opening and closing of file, Binary file operations, structures and file operations, classes and file operations, Random file processing.