COURSE STRUCTURE

Course Code	BCA20080				
Course Category	Program Major				
Course Title	Object Oriented Programming using C++				
Teaching Scheme	Lectures	Tutorials	Laboratory/Practical	Project	Total
Weekly Load Hrs.	2	-	2		4
Credits	2	-	1	-	3
Assessment Schema Code	TL4				

Course Objectives:

Programming in C++ course for students aims to equip them with object oriented programming fundamentals, problem-solving skills, and practical experience using one of the most popular and versatile programming languages.

Course Outcomes:

After completion of this course students will be able to

- Analyze the strengths of object oriented programming
- Design and apply OOP principles for effective programming
- Develop programming application using object oriented programming language C++

Course Contents:

Unit 1: Principles of Object-Oriented Programming[1]

- A Look at Procedure-Oriented programming,
- Object-Oriented Programming Paradigm
- Basic Concepts of Object-Oriented Programming
- Benefits of Object-Oriented Programming
- Object-Oriented Language
- Applications of OOP

Unit 2: Beginning with C++[1]

- What is C++
- Applications of C++
- A Simple C++ Program
- More C++ Statements
- An Example with Class
- Structure of C++ Program
- Creating the Source File
- Compiling and Linking

Unit 3: Tokens, Expressions and Control Structures[1]

- Introduction
- Tokens
- Keywords

- Identifiers and Constants
- Basic data Types
- User-Defined Data Types
- Symbolic Constants
- Type Compatibility
- Declaration Initialization of Variables
- Reference Variables
- Dynamic Initialization of Variable
- Operations in C++
- Operator Overloading
- Operator Precedence
- Control Structures

Unit 4: Functions in C++[2]

- Introduction
- The Main Function
- Function Prototyping
- Call by reference
- Return by Reference
- Inline Function
- Default Arguments
- const Arguments
- Function Overloading
- Friend and Virtual Functions
- Math Library Functions.

Unit 5: Classes and Objects[5]

- Introduction
- Specifying a Class
- Defining Member Functions
- A C++ Program with Class
- Making an Outside Function Inline
- Nesting Member Functions
- Private Member Functions
- Array within a Class
- Memory Allocation for Objects
- Statics Data Members
- Array of Objects
- Objects as Function Arguments
- Friendly Functions
- Returning Objects
- const Member Functions
- Pointers to Members

Unit 6: Constructors and Destructors[5]

- Introduction

- Constructors
- Parameterized Constructors
- Multiple Constructors in a Class
- Constructors with Default Arguments
- Dynamic Initialization of Objects
- Copy Constructor
- Dynamic Constructors
- Construction Two-dimensional Arrays
- Destructors

Unit 7: Operator overloading[5]

- Introduction
- Defining Operator Overloading
- Overloading Unary operators,
- Overloading Binary Operators
- Overloading Binary operators Using Friends
- String manipulation using operators
- Rules for overloading operators

Unit 8: Inheritance[5]

- Introduction
- Defining Derived Classes
- Types of Inheritance:-Single,Multiple,Multilevel,Hierarchical Inheritance,Hybrid Inheritance
- Virtual Base Classes
- Abstract Classes
- Constructors in Derived Classes

Unit 9: Pointers, Virtual Functions and Polymorphism[5]

- Introduction
- Pointers to Objects
- this Pointer
- Pointers to Derived Classes
- Virtual Functions
- Pure Virtual Functions

Learning Resources:

Text Books/Reference Books::

Text Book:

- Let us C++ by – Yashwant Kanetkar
- Object Oriented Programming with C++ by E. Balagurusamy

Reference Books:

- Object Oriented Programming with C++ by Robert Lafore
- Object Oriented Modeling and Design by James Rambough

- The Complete Reference C++ by Herbert Schildt

Web Resources
Weblinks:
https://www.geeksforgeeks.org/cpp-tutorial/

Pedagogy:
- Participative Learning,
- Discussion
- Demonstrations
- Practical

Assignments

Laboratory Experiments / Software based Practical

Sr. No.	Practicals to be conducted on
1	Tokens, Expressions and Control Structures
2	Functions in C++
3	Classes and Objects,array of objects
4	Constructors and Destructors(prgs on different types of constructors,dynamic initialization of constructor
5	Operator overloading(overloading unary ,binary operators with and without using friend function)
6	Inheritance(programs based on different types of inheritance,creating virtual base class)
7	Pointers to Objects,virtual functions,pure virtual functions