Chapter One: Introduction to Object Oriented Programming [4 hours]

- A Look at Procedure-Oriented Programming
- Concept of Object Oriented Paradigm
- Features of OOP
- Benefits of OOP
- Application of OOP

Chapter Two: Introducing C++ [4 hours]

- Introduction
    - Keywords, Identifiers and constants
    - Basic data types
    - User-defined data types
    - Operators in C++
- A Sample of C++ Program
- Reference Variables
- Functions in C++
- Inline Functions
- Function Overloading
- Comparison between C and C++

Chapter Three: Classes and Objects [6 hours]

- C structures Revisited
- Introduction to classes and objects
    - Specifying a class
    - Simple Class Example
    - Creating Objects
    - Initializing an Object
    - Accessing Class Members
- Defining a class with member function
    - Outside the class definition
    - Inside the class definition

    - A C++ Program with Class
    - Arrays within a Class
- Nesting of Member Functions
- Private Member Functions
- Objects in C++
    - Arrays of Objects
    - Objects as Function Arguments
    - Returning Objects
- Static Data Members
- Static Member Functions

Chapter Four: Object Constructions and Destructions [5 hours]

- Introduction to Constructor
- Parameterized Constructor
- Multiple Constructor in a class
- Constructor with Default arguments
- Copy Constructor
- Constructing two-dimensional arrays
- Destructor

Chapter Five: Operator Overloading [6 hours]

- Introduction
- Defining Operating Overloading
- Overloading Unary Operators
- Overloading Binary Operators
- Overloading Binary Operators using Friend Functions
- Manipulation of Strings Using Operators
- Rules for Overloading Operators

Chapter Six: Inheritance [6 hours]

- Introduction
- Base Classes and Derived Classes

- Single Inheritance and Multiple Inheritance
- Making a Private Member Inheritable
- Multilevel Inheritance
- Protected Members
- Virtual Base class and Abstract Classes
- Constructors and Destructors in Derived Classes
- Member Classes: Nesting of Classes

Chapter Seven: Polymorphism [6 hours]

- Introduction
    - Pointers
    - Declaring and Initializing Pointers
    - Manipulation of Pointers
    - Array of Pointers
    - Pointers to Functions
    - Pointers and String
- Pointers to Objects
- Pointers to Derived Classes
- Virtual Functions
- Pure Virtual Functions

Chapter Eight: Template [4 hours]

- Introduction
- Class Templates
    - Class templates with multiple parameters
- Function Templates
    - Function templates with multiple parameters
- Overloading of Template functions
- Member Function Templates
- Non-template arguments

Chapter Nine: Exception Handling [4 hours]

- Introduction
- Basics of Exception Handling
- Basics of Handling Mechanism
- Throwing and Catching Exceptions
- Re-throwing an Exception

Text Books

1. John R. Hubbard, “Theory and Problems of Programming with C++, 2/e”, McGraw-Hill.
2. H. M. Deitel, “C++ How to Program” D and D.
3. Friedman and Koffman, “Problem Solving, Abstraction and Design using C++ , 5/e”, Addison-Wesley.
4. E. Balagurusamy, “Object Oriented Programming in C++, 6/e” Tata McGraw-Hill Education

Grading

- Internal = 13
- Quiz 1 = 3
- Quiz 2 = 3
- Quiz 3 = 3
- Quiz 4 = 3
- Assignment = 5
- Lab Report = 5
- Lab Exam (End of the semester) = 10
- Viva (End of the semester) = 5