OBJECT ORIENTED PROGRAMMING
BEG 176CO

Year: I Semester: II

Teaching Schedule Hours/Week			Examination Scheme				
			Final		Internal Assessment		Total
L	P	T	Theory	Practical	Theory	Practical	
3	3	-	80	-	20	50	150

Duration: 3 Hours

Course Details:

1. **Overview** (3 Hrs)
   - 1.1 Comparing Procedural Programming & Object oriented Programming paradigm.
   - 1.2 Characteristics of Object-Oriented Languages
     - 1.2.1 Objects
     - 1.2.2 Classes
     - 1.2.3 Inheritance
     - 1.2.4 Reusability
     - 1.2.5 Creating new data types
     - 1.2.6 Polymorphism and Overloading
   - 1.3 Application & benefits of using OOP

2. **C++ language basic syntax.** (2 Hrs)
   - 2.1 Derived Types
   - 2.2 Standard conversions and promotions
   - 2.3 New and Delete operators
   - 2.4 Arrays and pointer in C++
   - 2.5 Const
   - 2.6 Enumeration
   - 2.7 Comments

3. **Functions in C++** (3 Hrs)
   - 3.1 Functions overloading
   - 3.2 Default arguments
   - 3.3 Inline function

4. **Classes and Objects** (7 Hrs)
   - 4.1 Introduction
   - 4.2 Class Specification: data encapsulation (public, protected, private modifiers)
   - 4.3 Class Objects
   - 4.4 Accessing class members
   - 4.5 Defining member function
     - 4.5.1 Member function Inside the Class Body
     - 4.5.2 Member function Outside the Class Body
   - 4.6 'this' pointer
   - 4.7 Static of class member functions
   - 4.8 Pointers within a class
   - 4.9 Passing objects as arguments
   - 4.10 Returning objects from functions
   - 4.11 Friend function & Friend classes

5. **Constructors and Destructors** (5 Hrs)
   - 5.1 Functions of constructors and destructors
   - 5.2 Syntax of constructors & destructors
   - 5.3 Types of Constructors

6. **Operator Overloading** (5 Hrs)
   - 6.1 Introduction
   - 6.2 Operator Overloading Restrictions
   - 6.3 Overloading Unary and Binary Operators
   - 6.4 Operator Overloading Using a friend function
   - 6.5 Data Conversion
     - 6.5.1 Conversion between basic types
     - 6.5.2 Conversions between objects and basic types
     - 6.5.3 Conversion between objects of different classes

7. **Inheritance** (5 Hrs)
   - 7.1 Introduction
   - 7.2 Types of Inheritance
   - 7.3 Inheritance: Base classes & Derived classes
   - 7.4 Type Casting: Base class pointers to Derived class pointers
   - 7.5 Using constructors and Destructors in Derived Classes
   - 7.6 Benefits and cost of Inheritance

8. **Virtual functions and Polymorphism** (5 Hrs)
   - 8.1 Introduction
   - 8.2 Virtual functions
   - 8.3 Pure virtual functions and abstract classes
   - 8.4 Using virtual functions
   - 8.5 Early vs Late Binding

9. **Input/Output** (5 Hrs)
   - 9.1 Stream based input/output
   - 9.2 Input/Output class hierarchy
   - 9.3 File Input/Output

10. **Advanced C++ topics** (5 Hrs)
    - 10.1 Templates
      - 10.1.1 Introduction to Templates
      - 10.1.2 Function Templates
      - 10.1.3 Class Templates
      - 10.1.4 Standard Template Library
    - 10.2 Namespaces
      - 10.2.1 Introduction
      - 10.2.2 Declaring a Namespace
    - 10.3 Exceptions
      - 10.3.1 Introduction to Exceptions
      - 10.3.2 Exception Handling model
      - 10.3.3 Exception Handling Construct: try, throw, catch
    - 10.4 Creating Header files

Laboratories:

There shall be 15 lab exercises covering features of Object-Oriented Programming.

Reference Books:

1. Robert Lafore, "Object-Oriented Programming in C++", Galgotia Publication, India
2. Deitel & Deitel, "C++ How to Program", 3rd Edotion, Prentice Hall
3. Navajyoti Barkakati, "Object-Oriented Programming in C++", Prentice Hall of India
4. Venugopal, Rajkumar & Ravishankar, "Mastering C++", Tata McGraw Hill Publication, India
5. E. Balagurusamy, "Object Oriented Programming in C++", Tata McGraw Hill, 2nd Edition