COMP 116: Object Oriented Programming [3 Credit]

Objectives

This course introduces the fundamental concepts of object-oriented programming Constructs in C++. Topics include classes, objects, inheritance, polymorphism and template etc.

Contents:

1. Introduction to Object Oriented Programming
   - 1.1. Concept of Object Oriented Paradigm
   - 1.2. Features of OOP
   - 1.3. Benefits of OOP

2. Introducing C++
   - 2.1. Introduction
   - 2.2. A Sample C++ program
   - 2.3. Reference Variables
   - 2.4. Inline functions
   - 2.5. Function Overloading
   - 2.6. Comparison between C and C++

3. Classes and Objects
   - 3.1. Introduction to Classes and Objects
   - 3.2. Defining a class with member function
   - 3.3. Private member functions
   - 3.4. Initializing an object
   - 3.5. Static data member
   - 3.6. Static member functions

4. Object Constructions and Destructions
   - 4.1. Introduction to Constructor
   - 4.2. Parameterized Constructors
   - 4.3. Copy constructor
   - 4.4. Destructor

5. Operator Overloading
   - 5.1. Introduction
   - 5.2. Defining Operator Overloading
   - 5.3. Overloading Unary Operators
   - 5.4. Overloading Binary Operators
   - 5.5. Overloading Binary Operators using Friend Functions

6. Inheritance
   - 6.1. Introduction
   - 6.2. Base Classes and Derived Classes
   - 6.3. Single Inheritance and Multiple Inheritance
   - 6.4. Protected Members
   - 6.5. Virtual Base Classes and Abstract Classes
   - 6.6. Constructor and Destructor in Derived Classes

7. Polymorphism
   - 7.1. Introduction
   - 7.2. Pointers to Objects
   - 7.3. Pointers to Derived Classes
   - 7.4. Virtual Functions
   - 7.5. Pure Virtual Functions

8. Template
   - 8.1. Introduction
   - 8.2. Class Templates
   - 8.3. Function Templates

9. Exception Handling
   - 9.1. Introduction
   - 9.2. Basic Exception Handling
   - 9.3. Exception Handling Mechanism
   - 9.4. Throwing and Catching Exception
   - 9.5. Re-throwing and Exception

Text Books:
N/A

References:
John R. Hubbard, "Theory and Problems of Programming with C++, 2/e", McGraw-Hill.
H. M. Deitel, "C++ How to Program" D&D.
Friedman and Koffman, "Problem Solving, Abstraction and Design using C++ , 5/e", Addison-Wesley.

Evaluation:
Internal = 50
Final = 50