

Course Brochure

'C++' with Data Structures

Overview

•C++ Language is one of the approaches to provide object-oriented functionality with C-like syntax. C++ adds greater typing strength, scoping and other tools useful in object-oriented programming and permits generic programming via templates. It is regarded as a middle-level language, as it comprises a combination of both high-level and low-level language features. Some of its application domains include systems software, device drivers, embedded software, high-performance server and client applications, and entertainment software such as video games

Pre-requisites

•Knowledge of any Operating System & 'C' Language preferable.

Applications

COURSE CONTENTS

Basics in C++

- ❖ Procedure Oriented Programming
- ❖ Principle of Object Oriented Programming
- ❖ Software evaluation
- ❖ Oop paradigm
- ❖ Basic concept of Oop
- ❖ Benefit of Oop
- ❖ Application of Oop
- ❖ Programming Methods
- ❖ Introduction to C++
- ❖ Tokens
- ❖ Keywords
- ❖ Identifiers
- ❖ Constants
- ❖ Operators
- ❖ Scope Resolution operator(::)
- ❖ Memory Management Operators
- ❖ Manipulators

Control Structures

- ❖ Sequential Control Structure
- ❖ Selective Control Structure
 - If, if...else, if...else if, nested if
 - Switch case statement
 - Nested Switch
- ❖ Repetitive Control Structure
 - For Loop
 - While Loop
 - Do while Loop
 - Continue and break
 - Nested loop

Arrays and Strings

- ❖ Single dimensional array
- ❖ Two dimensional array
- ❖ Multi-dimensional array
- ❖ What are strings?
- ❖ String Manipulation Functions

Functions

- ❖ Introduction
- ❖ Defining a function
- ❖ Function Prototypes
- ❖ Return type in main Prototype
- ❖ Call by value and call by Reference
- ❖ Return by Reference
- ❖ Inline Function
- ❖ Friend Function
- ❖ Functions with default arguments
- ❖ Function Overloading
- ❖ Default arguments
- ❖ Actual and Formal Parameter
- ❖ Function overloading

Basic concepts of Object Oriented Programming

- ❖ Object
- ❖ Class
- ❖ Inheritance
- ❖ Polymorphism
- ❖ Data Abstraction
- ❖ Data Encapsulation
- ❖ Dynamic Binding
- ❖ Message Passing

Classes and Objects

- ❖ Introduction
- ❖ C structure Revisited
- ❖ Defining Classes in C++
- ❖ Class declaration
- ❖ Access specifiers
- ❖ Classes and Encapsulation
- ❖ Member Functions
- ❖ Instantiating and Using Classes
- ❖ Objects as arguments
- ❖ Difference between Class and Structure
- ❖ Returning objects
- ❖ Static member Data and Static Member Function
- ❖ Friend Functions and Friend classes

COURSE CONTENTS

Constructors and Destructors

- ❖ Introduction
- ❖ Defining constructor
- ❖ Using Constructors
- ❖ Multiple Constructors and Initialization Lists
- ❖ Constructor overloading
- ❖ Default constructor
- ❖ Copy constructor
- ❖ Destructor
- ❖ Defining Destructor
- ❖ Using Destructors to Destroy Instances

Inheritance

- ❖ Overview of Inheritance
- ❖ What is Inheritance?
- ❖ Features or Advantages of Inheritance
- ❖ Private, Public, Protected Members
- ❖ Types of inheritance
- ❖ Single inheritance
- ❖ Multiple inheritance
- ❖ Multi-level inheritance
- ❖ Hierarchical Inheritance
- ❖ Hyrid Inheritance
- ❖ Defining Base and Derived Classes
- ❖ Constructor and Destructor Calls
- ❖ Inheritance scope

Pointers

- ❖ Reference Pointer(&)
- ❖ Dereference Pointer(*)
- ❖ Declaring variables of pointer types
- ❖ Pointer Initialization
- ❖ Pointers and Arrays
- ❖ Pointer Arithmetic
- ❖ Pointers to Functions
- ❖ Pointers to pointers
- ❖ This pointer
- ❖ Void pointer
- ❖ Null pointer
- ❖ Dynamic memory allocation
- ❖ New, delete operator

Operator Overloading

- ❖ Need of overloading
- ❖ Defining operator overloading
- ❖ Overloading unary operators
- ❖ Overloading binary operators
- ❖ Overloading binary operators using friend function
- ❖ Rules for operator overloading
- ❖ Overloading other operators

Polymorphism and Virtual function

- ❖ Types of polymorphism
- ❖ Early binding
- ❖ Dynamic binding
- ❖ Virtual Functions
- ❖ Pure Virtual function
- ❖ Null virtual function

Templates

- ❖ Introduction
- ❖ Templates
- ❖ Function Templates
- ❖ Class Templates
- ❖ Member function Templates
- ❖ Template Arguments

Exception Handling

- ❖ Introduction
- ❖ Syntax of Exception Handling Code
- ❖ Exception handling mechanism
- ❖ Try, catch, throw keywords

File Handling

- ❖ Introduction
- ❖ Classes for File Stream Operations
- ❖ Opening and closing a file
- ❖ Ifstream, Ofstream, Fstream
- ❖ Detecting End of file
- ❖ Sequential Access files
- ❖ Random Access files
- ❖ Binary Files
- ❖ Command line arguments

COURSE CONTENTS

DATA STRUCTURES

Linear Data Structures

Linked List

- ❖ Single Linked List
- ❖ Double Linked List
- ❖ Single circular Linked list
- ❖ Double Circular Linked list

Stack

- ❖ Stack ADT using an Array
- ❖ Stack ADT using a single linked list

Queues

- ❖ Queue ADT using an Array
- ❖ Queue ADT using a single linked list
- ❖ Circular Queues
- ❖ De Queues

Non Linear Data Structures

- ❖ Binary Tree ADT using linked list
- ❖ Binary tree traversla methods
- ❖ Preorder, In-order, Post-ordered traversal
- ❖ Operation of Binary trees
- ❖ Insert, Delete & modify
- ❖ Binary Search Trees

Device Driver Programming

FAQ