



**C++**





# About Course

C++ is a powerful general-purpose programming language. It can be used to develop operating systems, browsers, games, and so on. C++ supports different ways of programming like procedural, object-oriented, functional, and so on. This makes C++ powerful as well as flexible.

C++ is an object-oriented programming (OOP) language that is viewed by many as the best language for creating large-scale applications. C++ is a superset of the C language. A related programming language, Java, is based on C++ but optimized for the distribution of program objects in a network such as the Internet.



# C++ PROGRAMMING LANGUAGE

## CURRICULUM

### ① C++ Programming Contents :

Introduction to C++ Language

Difference and similarities between C and C++

Role of Compilers and Assemblers

Introduction to C++ Basic

Flow Control Statement

Jump Statements

Conditional Statements

Iteration Statements

### ② Arrays :

Introduction to Arrays

Several examples of Arrays like insert, delete, counter occurrence of items etc.

Searching

Sorting

2D Array

Several examples of 2D Arrays

Multidimensional Arrays



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## Strings

Introduction to Strings

Strings handling built in functions

Several examples of Strings

Array of Strings

Searching in Array of Strings

Sorting in Array of Strings

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## Pointers

Introduction to Pointers

Pointer expressions

Types of pointers

Void Pointer

Null Pointer

Wild Pointer

Dangling Pointer

Various examples of Pointers

Pointer Arithmetic's

Array using Pointers

Array of Pointer

Changing Pointer

String using Pointers

Pointers in Functions



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## **FUNCTIONS**

**Introduction to functions**

**Types of functions**

**Nesting of functions**

**Various examples of functions**

**Strings passing in functions**

**Array Passing in Functions**

**Pointer passing in functions**

**Function Returning Address**

**Function returning address**

**Recursion**

**Various Examples and Interview Questions**

**on Recursion and Function Storage classes**

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## **STRUCTURE**

**Introduction to structure**

**Advantages of structure**

**Array of structure**

**Structure using pointer**

**Structure with functions**

**Applications of structure**

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## **DYNAMIC MEMORY ALLOCATION**

**Introduction to dynamic memory allocation**



Advantage of dynamic memory allocation

New and delete operators

Array implementation using dynamic memory allocation

## 8 Oops Introduction

Oops vs. Procedural Programming Approach

Oops Implementation

Accessing class members

Array of objects

Types of members of class

Instance members

Static members

Scope resolution Operator (::)

Oops Approaches

Encapsulation

Nesting of Class(i.e. Outer Class,  
Inner Class, Local Class)

Polymorphism

Function Overloading

Constructor & Destructor

Deep Copy

Shallow Copy



# Operator Overloading Function Overriding

Reference variable  
Pointers

Class object using pointer  
Array of objects using pointer  
This pointer Etc.

Inheritance

Single Inheritance  
Multiple Inheritance  
Multilevel Inheritance  
Hierarchical inheritance  
Hybrid Inheritance  
Need of Virtual

Friend Function and Friend Class  
Function Overriding

Binding Types  
Static Binding and Dynamic Binding  
Up casting and Down casting  
Virtual Function

Abstraction

Data Abstraction  
Abstract Class



## Pure Virtual Function

Inline Functions

Composition and Aggregation

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## Exception Handling

Introduction to Exception Handling

Need of Exception Handling

try, throw, catch

Multiple catch blocks

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## FILE MANAGEMENT

Introduction to file management

File opening modes

Opening and closing a file

Input output operations on file

Error handling

Applications of file management

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## Multithreading:

Thread introduction

Thread Synchronization

Life cycle of thread

Deal Lock situation



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## **Templates (Generic Programming):**

**Introduction to Templates and Generic Programming**

**Advantages of template**

**Template function and Template class**

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## **Standard Templates Library**

**Container**

**Class**

**Functions**

**Iterators**

**List class**

**Stack class**

**Queue Class**

**De Queue Etc.**

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## **Introduction To Data Structure And Algorithms**

**What is data structure**

**Benefits of data structure**

**Types of data structure**

**Introduction to algorithms**

**Types of Algorithms**

**Time and Space Complexity**

**Interview Questions**



# LINEAR DATA STRUCTURE

Array

String

Link list

Introduction to link list

Array vs. link lists

Types of link lists

Implementation of link list

Singly link list

Insertion(at first position, last position and at used specific position), deletion(at first position, last position and at used specific position), traversing operations in Singly linked list

Doubly link list

Insertion (at first position, last position and at used specific position), deletion(at first position, last position and at used specific position), traversing operations in Doubly linked list

Circular link list

Insertion(at first position, last position and at used specific position), deletion(at first position,





last position and at used specific position),  
traversing operations in Circular linked list

Application of link list  
Interview Questions

## Stack

Introduction to stack  
Stack using array  
Stack using linked list  
Applications of stack  
Reverse Polish Notations (Infix to Postfix and  
Infix to Prefix)  
Interview Questions

## Queue

Introduction to queue  
Queue using array  
Queue using linked list  
Applications of queue  
Introduction to circular queue  
Application of Circular queue  
Introduction to DeQueue(Double Ended Queue)  
Application of Dequeue  
Priority Queue  
Interview Questions



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## Non-linear data structure

### Tree

Introduction to trees

Types of trees

Implementation of trees

Binary tree

Binary search tree

AVL tree

Threaded binary tree

M way tree

M way search tree

B tree

Heap

Various operations on trees

Application of trees

Interview Questions

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## Searching and sorting

Searching in arrays

Searching in strings

Linear Search

Binary Search

Sorting

Various sorting techniques



**Selection sort**  
**Bubble sort**  
**Insertion sort**  
**Quick sort**  
**Heap sort**  
**Merge sort**  
**Radix Sort**

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## **Graph**

**Introduction of graph**

**Types of graphs**

**Implementation of graph using Adj. Matrix and Adj. list**

**Various operations on graphs**

**Shortest path search in graph**

**Floyd Warshall Algorithm**

**Dijkstra Algorithm**

**Minimum spanning tree**

**Kruskal's Algorithm**

**Prims Algorithm**

**Applications of graphs**

**Interview Questions**



# Hashing

Introduction of hashing

Hash table

Applications of hashing




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