

# C++ PROGRAMMING – A COMPLETE COURSE

## 1. Introduction

- Introduction to Programming
- Introduction to C++
- Let's start

## 2. First look at a C++ Program

- Basic structure of a C++ program
- Let's program

## 3. Some basic fundamental concepts of C++

- Tokens/Character set
- Operators
- Data types
- Some other important helpers ( cin>>.,cout<<,statements,expressions..)

## 4. Flow of Control

- Introduction, Flowcharts
- Sequence
- Selection
  - ❖ Switch-case
  - ❖ If-else
- Iteration
  - ❖ For construct
  - ❖ Do-while construct
  - ❖ While-do construct
- Jump statements

## 5. Derived data types

- Introduction
- Types
- Arrays
- Functions
- Pointers
- References
- Constants

## 6. Arrays

- Types
- Strings
- Initialization
- Functions + Arrays
- Applications

## 7. Functions

- Introduction and Parts
- Types
- Void and Return
- Default arguments v/s constant arguments
- Call by value v/s Call by reference
- Scope rules

- Built-in functions

## 8. User defined data types

- Introduction
- Types
- Class
- Structure
- Union
- Enumeration

## 9. Structures

- Elements
- Nested Structures
- Structures + Arrays
- Structures + Functions

## 10. Basic OOPs concept

- Data abstraction
- Encapsulation
- Modularity
- Inheritance
- Polymorphism

## 11. Function Overloading

- Need for function overloading
- Declaration and definition
- Calling overloaded functions
- Function overloading v/s default arguments

## 12. Classes and Objects

- All about Classes
- Data hiding and encapsulation
- Functions in a class
- Using Objects
- Static class members

## 13. Constructors and Destructors

- Constructors
  - ❖ Need
  - ❖ Declaration and definition
  - ❖ Default v/s parameterized constructors
  - ❖ Invocation of constructors
  - ❖ Copy constructor
  - ❖ Constructor overloading
- Destructors
  - ❖ Need
  - ❖ Declaration and definition

## 14. Inheritance

- introduction
- Different forms
- Derived and Base classes
  - ❖ Single inheritance
  - ❖ Multiple inheritance

- ❖ Visibility modes
- Inheritance and access control
- Virtual base class
- Nesting of classes

### 15. Data File Handling

- Introduction
- The fstream.h header file
- Data files
- Opening and closing of files
- Steps to process a file in your program
- Changing the behaviour of streams
- Sequential I/O with files
  - ❖ The get() , getline() and put() functions
  - ❖ The read() and write() functions
- Detecting EOF
- File pointers and random access
- Basic operations on Binary files

### 16. Pointers

- Introduction
- C++ memory map and free store
- Declaration and initialization of pointers
- Dynamic allocation operators
- Pointers and..
  - ❖ Arrays
  - ❖ Const
  - ❖ Functions
  - ❖ Objects

### 17. Data Structures

- Elementary data representation
- Different data structures
  - ❖ Arrays
  - ❖ Structure
  - ❖ Stacks
  - ❖ Queues
  - ❖ Linked lists
  - ❖ Trees
- Operations on data structures
- Types of arrays
  - ❖ Operations on One-dimensional arrays
  - ❖ Operations on two-dimensional arrays

### 18. Stacks

- Introduction and use

### 19. Queues

- Introduction and use

### 20. Linked Lists

- Introduction and use

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