

## The 'C' Language

### Course Highlights

This C training course is intended for students without any programming background. It covers most C syntax elements, concentrating on fundamental and universally useful elements, while providing an overview of many more advanced elements.

#### Module 1 - A 'C' program structure

- Components of a program
- The main () function
- Adding comments
- Preprocessor of a program
- New line character
- Program compilation and execution

#### Module 2 - Data types, variables and constant

- Data Types
- Variables
- Constant
- 'C' operators

#### Module 3 - Input/Output

- The print() function
- Escape sequence
- Automatic type conversation
- Format Description
- Type conversion
- Explicit type conversion

#### Module 4 - Control flow structure

- Sequential control structure
- The if-else statement
- Ternary operator
- The switch-case statement
- Iterative control structure
- The break statement
- The continue statement
- The go to statement

#### Module 5- Arrays and string function

- 1D Arrays
- 2D Arrays
- Multi-D Array
- String and strings functions

#### Module 6- Pointer

- Introduction Pointer
- Pointer and arrays
- Pointer and two-dimensional arrays
- Pointer arithmetic

#### Module 7 - Function

- User defined functions
- Passing values to functions
- Storage classes
- Type conversion

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**Bhanwarkuan Centre:** 18- Professor Colony, Wadhvani Chambers, Bhanwarkuan square, Indore. Ph 0731- 4289083/ 84

Email: [info@ssiedu.in](mailto:info@ssiedu.in)

- Return value
- Function with arrays

#### Module 8- Structures

- User defined data types
- Nested structure
- Structure declaration
- Structure and functions unions

#### Module 9 - File handing and file

- Introductions to files
- File handing
- Opening a file (f open)
- Character I/O from files
- Binary I/O from files
- Random access
- Writing records onto files
- Elementary Database

#### Module10- Data structures

- Introduction to data structures
- Linked list
- Doubly linked lists
- Linked list operations

#### Module 11 - Stacks, Queues, and Binary Trees

- Introduction to stacks and queues
- Representing stacks in C
- Queues
- Representing queues in C
- Binary trees
- Representing binary trees in C

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Email: [info@ssiedu.in](mailto:info@ssiedu.in)

## The C++ Language

### Course Highlights

This C++ training course is intended for students without an extensive programming background. It covers most C++ syntax elements, concentrating on fundamental and universally useful elements, while providing an overview of many more advanced elements. It also covers oops concept with C++.

#### Module 1 - Introduction to C++

- Introduction
- Getting acquainted with C++
- using cin and cout
- Data types
- User defined keywords
- Variables
- Const type qualifier
- Operator & programming constructs
- Arithmetic operators

#### Module 2 - Arrays, pointers & functions

- Arrays fundamentals
- Two-dimensional arrays
- Using pointers
- Data abstraction
- Encapsulation
- Dynamic memory manipulation
- The New and Delete operator
- Constructors & destructors
- The this pointer
- Inline functions

#### Module 3 - Inheritance

- What is inheritance?
- Type of inheritance
- Qualifiers
- Scope resolution operator
- Multi path inheritance
- Uses of Inheritance

#### Module 4 - Polymorphism

- Overloading
- Overloaded member function
- Qualifiers
- Overloaded constructors
- Overloaded functions in a class
- Operator overloading

#### Module 5 - Polymorphism

- Introduction to classes & objects
- Pure virtual function
- Null virtual functions
- Abstract classes
- Early and late binding
- Method overloading and overriding

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Email: [info@ssiedu.in](mailto:info@ssiedu.in)

**Module 6 - File handling**

- File input & output
- Reading & writing text
- Binary input & output
- Random access to a file
- Error handling
- Elementary Database application

**Module 7- Templates and exception**

- Templates
- Generic functions
- Class with generic data types
- Generic data type with function

**Module 8- Dynamic polymorphism**

- Linked lists
- Types of linked lists
- Advantages of linked lists over
- Memory management

**Module 9- Binary tree**

- Representing a binary tree
- Traversing a binary tree

**Module 10- Exception**

- Exception handling fundamental
- Using multiple catch statement
- Exception handling options
- Nested Try Catch

**Module 11- Data structure**

- Data structure in C++
- Limitations of array
- Stack
- Queue

**Module 12 – Graphics with C++**

- Basics of Graphics and Technologies Used
- Drawing Shapes
- Moving Shapes
- How to detect pixels
- Painting Shapes

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