



C & C++ Course Content

C Basics

- History of C
- Characteristics of C
- C Program Structure
- Variables
 - Defining Global Variables
 - Printing Out and Inputting Variables
- Constants
- Arithmetic Operations
- Comparison Operations
- Logical Operators
- Order of Precedence

Conditionals

- Conditionals
- The if statement
- The? Operator
- The switch Statement

Looping and Iteration

- The for statement
- The while statement
- The do-while statement
- Break and continue

Arrays and Strings

- Defining, initializing and using arrays
- Single and Multi-dimensional Arrays
- Arrays of Characters and Strings
- Arrays and pointers
- Strings

Functions

- Role of Functions
- Passing arguments to functions
- Returning values from functions



- Recursive functions
- Call back functions
- Implications on Stack
- Pass by value / reference
- Passing Arrays to functions

String Handling :

- Basic String handling functions
- String Searching
- Character Conversions and testing : <type .h>
- Memory Operations: <memory .h>

Structures and Unions

- Structures
- Nested Structures
- Array of Structures
- Allocation of memory and holes
- Unions

Advanced Pointer Topics

- The purpose of pointers
- Defining pointers
- The & and * Operators
- Pointer Assignment
- Pointers with functions
- Pointer Arithmetic
- Advanced pointer types
- Pointers to functions
- Pointers to String
- Pointers and Dynamic memory
- Pointers and Structures
- Common Pointer Pitfalls
 - Not assigning a pointer to memory address before using it
 - Illegal indirection

Storage Classes

- Scope
- Internal
- External
- Automatic
- Static
- Scope and extent of parameters



Low Level Operators and Bit Fields

- Bitwise Operators
- Bit Fields
 - Bit Fields: Practical Example
 - A note of Caution: Portability

The C Processor

- #define
- #undef
- #include
- #if – conditional inclusion
- Preprocessor Compiler Control
- Other Preprocessor Commands

Integer Functions, Random Number

- String Conversion
- Arithmetic Functions
- Random Numbers
- String Conversion

C++ Object Oriented

Object Oriented Paradigm

- OOPS...!
- Structured versus Object Oriented Development
- Elements of Object Oriented Programming
- Objects
- Classes
- Encapsulation
- Data Abstraction
- Inheritance
- Polymorphism
- Templates
- Exception Handling

Moving from C to C++

- Scope resolution Operator
- Variables aliases(reference variables)
- Parameters passing by References
- Inline functions
- Function Overloading



- Default Arguments

Classes and Objects

- Introduction
- Structures and Classes
- Class specification
- Class objects
- Class, Objects and memory resources
- Accessing class members
- Defining Member Functions
- Outside member functions as inline
- Accessing member functions with in class
- Data Hiding
- Passing Objects as arguments

Classes and Objects

- Friend Classes
- Static data members
- Static Functions

Constructors and Destructors

- Introduction
- Need of the Constructor
- Parameterized constructor
- Constructor overloading
- Constructor with default arguments
- Name less objects
- Copy constructors
- New and delete operators
- Dynamic initialization through constructors

Operator Overloading

- Introduction
- Over loadable operators
- Unary operator overloading
- Operator return values
- Name less Temporary Objects
- Limitations of Increment and Decrement Operators
- Binary Operator Overloading
- Overloading New and Delete Operator
- Comparison Operators
- Data Conversion
- Conversion between Data types



- Conversion between basic and Objects
- Conversion between Objects of different classes
- Assignment operator overloading
- Overloading with friend functions

Inheritance

- Introduction
- Derived class declaration
- Forms of inheritance
- Member Accessibility
- Constructors in derived classes
- Overloaded Member functions
- Abstract classes
- Multilevel Inheritance
- Multiple Inheritances
- Hierarchical Inheritance
- Multipath Inheritance
- Virtual Base Class
- Hybrid Inheritance

Virtual Functions & Polymorphism

- Introduction
- Need for virtual functions
- Pointers of derived class objects
- Definitions of Virtual Functions
- Pure Virtual Functions
- Dynamic Binding
- Rules For virtual functions

Templates

- Introduction
- Function Templates
- Overloaded Function Templates
- Multiple Argument Function Templates
- Class Templates
- Class Templates with overloaded operators

Exception Handling

- Introduction
- Error Handling
- Exception Handling
- Try, throw, catch
- List of Exceptions



- Specified, Unspecified exceptions
- Handling Uncaught Exceptions

Streams Computation With console

- What are streams?
- Console Streams
- Unformatted, Formatted Console O/P

Manipulating Strings

- Creating(string) objects
- Manipulating String Objects
- Relational Operations
- String Characteristics

Object-Oriented Systems Development

- Procedure-Oriented Development Tools
- Object-Oriented Notations and Graphs
- Steps in Object-Oriented Analysis
- Steps in Object-Oriented Design
- Implementation