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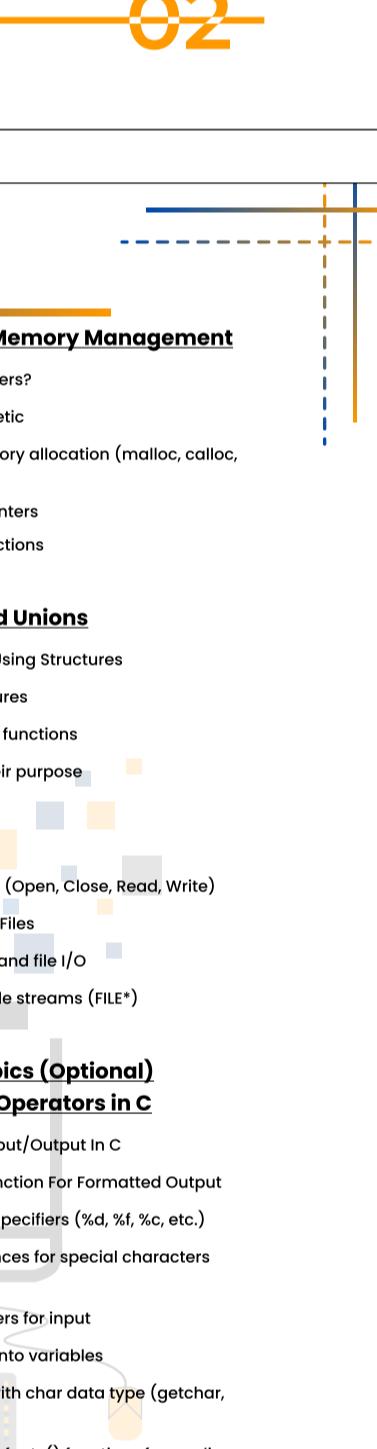
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## C/ C++ Syllabus

### COURSE CONTENTS

- Introduction to C Programming
- Operators and Expressions
- Data Types and Input/Output Operators
- Control Statements and Decision Making
- Pointers
- Structures and Unions
- Functions
- Arrays and Strings
- C++ Syllabus
- Data Structure Syllabus



## C / C++ Syllabus

### Introduction to C Programming

- What Is Computer Programming
- Features Of C And Its Basic Structure
- Simple C Programs, Constants
- Integer Constants, Real Constants, Character Constants, String Constants
- Backslash Character Constants
- Keywords In C
- Concept of an Integer and Variable
- Rules for naming Variables and assigning values to variables
- Hello World Program Using C

### Control Statements and Decision Making

- The Go To Statement

- The If Statement

- The if-else Statement

- Nesting of if Statements

- The Conditional Expression

- The Switch Statement

- The While loop The do...While Loop, The For Loop

- The nesting of for loops

- The Break statement and continue statement.

### Operators and Expressions

- Arithmetic Operators
- Unary Operators
- Relational and Logical Operators
- The Conditional Operator
- Library Functions
- Bitwise Operators
- The Increment and Decrement Operators
- The Size of Operator

### Pointers

- Basics Of Pointers
- Pointers And One-Dimensional Arrays
- Pointer Arithmetic
- Pointer Subtraction and Comparison
- Null Pointers
- Pointers and Strings
- Pointers and two-dimensional arrays
- Arrays of Pointers

### Data Types and Input/Output Operators

- Floating-Point Numbers
- Converting Integers To Floating-Point And Vice-Versa
- The Type cast Operator
- The Type Char Keywords
- Character Input and Output
- Formatted Input and Output
- The Gets () and Puts () functions

### Structures and Unions

- Basics Of Structures
- Structures
- Unions

### Functions

- Function Basics
- Function Prototypes
- Passing Parameters: Passing Parameter by Value and Passing Parameter by Reference
- Passing String to Function
- Passing String to Function
- Functions Recursion

### Arrays and Strings

- One Dimensional Arrays
- Multidimensional Arrays
- Strings

### C++ Syllabus

- Introduction To C++ Programming
- Operators And Expressions In C++
- Data Types and Input/Output in C++
- Flow Control Statements and Decision Making in C++
- Functions in C++
- Arrays and Strings
- Pointers in C++
- Structures and Unions in C++
- Object Oriented Programming in C++
- Constructors & Destructors in C++
- Inheritance in C++
- Polymorphism And Virtual Functions in C++
- Exception Handling in C++
- Files Handling in C++

### Data Structure Syllabus

- Prerequisites
- Arrays
- Linked List
- Stack
- Queue
- Trees
- Tree Traversal Techniques
- Graphs

### Control Statements and Decision Making

- The Go To Statement
- The If Statement
- The if-else Statement
- Nesting of if Statements
- The Conditional Expression
- The Switch Statement
- The While loop The do...While Loop, The For Loop
- The nesting of for loops
- The Break statement and continue statement.

### Pointers and Memory Management

- What Are Pointers?
- Pointer Arithmetic
- Dynamic memory allocation (malloc, calloc, realloc, free)
- Arrays and pointers
- Pointers to functions

### Structures and Unions

- Creating And Using Structures
- Nesting Structures
- Structures and functions
- Unions and their purpose

### File Handling

- File Operations (Open, Close, Read, Write)

- Text Vs. Binary Files

- Error handling and file I/O

- Working with file streams (FILE\*)

### Advanced Topics (Optional)

#### Input/Output Operators in C

- Overview of Input/Output in C
- The Printf() Function For Formatted Output
- Use of format specifiers (%d, %f, %c, etc.)
- Escape sequences for special characters (\n, \t, etc.)
- Format specifiers for input
- Reading data into variables
- Input/output with char data type (getchar, putchar)
- The gets() and fgets() functions for reading strings
- String input limitations and buffer overflow risks
- Writing and reading to/from files using printf() and fscanf()

### Arrays and Strings

- Declaring And Initializing Arrays

- Accessing Array Elements

- Multidimensional arrays

- String handling functions

- Character arrays vs. strings

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### Control Flow

- Conditional Statements (If, Else If, Else)

- Switch Case Statements

- Loops (for, while, do-while)

- Break and continue statements

- Logical operators: && (AND), || (OR), ! (NOT)

### Functions and Modular Programming

- What Are Functions?

- Function Declaration And Definition

- Function parameters and return values

- Scope and lifetime of variables

- Function prototypes

- Recursion

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