

C LANGUAGE SYLLABUS

Module 1: Introduction to C

- History and Features of C
- Structure of a C Program
- Installation & Setup (Compiler, IDE)
- Writing and Executing First Program
- Keywords, Identifiers, Variables
- Data Types & Constants

Module 2: Operators & Expressions

- Arithmetic Operators
- Relational & Logical Operators
- Assignment Operators
- Increment & Decrement Operators
- Operator Precedence & Associativity
- Expressions and Evaluation

Module 3: Input & Output

- Input Functions (scanf)
- Output Functions (printf)
- Format Specifiers
- Escape Sequences
- Basic User Input Programs

Module 4: Control Statements

- if, if-else, nested if
- switch statement
- Conditional (ternary) operator

- Decision-making programs

Module 5: Loops

- while loop
- do-while loop
- for loop
- Nested loops
- Break & Continue statements

Module 6: Functions

- Introduction to Functions
- Function Declaration & Definition
- Types of Functions
- Parameter Passing (Call by Value)
- Recursion
- Return Values

Module 7: Arrays

- Introduction to Arrays
- One-dimensional Arrays
- Two-dimensional Arrays
- Array Operations (search, sort)
- Passing Arrays to Functions

Module 8: Strings

- Introduction to Strings
- String Functions (strlen, strcpy, strcat, strcmp)
- String Input/Output
- String Manipulation Programs

Module 9: Pointers

- Introduction to Pointers
- Pointer Arithmetic
- Pointers and Arrays
- Pointers and Functions
- Dynamic Memory Allocation (malloc, calloc, free)

Module 10: Structures & Unions

- Introduction to Structures
- Accessing Structure Members
- Arrays of Structures
- Nested Structures
- Unions and Differences

Module 11: File Handling

- Introduction to Files
- File Modes (r, w, a)
- File Operations (fopen, fclose, fread, fwrite)
- Reading/Writing Files
- File Handling Programs

Module 12: Preprocessor & Header Files

- Preprocessor Directives (#include, #define)
- Macros
- Conditional Compilation
- Header Files

Module 13: Advanced Concepts

- Storage Classes (auto, static, extern, register)
- Bitwise Operators

- Typedef
- Enum

Module 14: Debugging & Best Practices

- Common Errors (Syntax, Runtime, Logical)
- Debugging Techniques
- Code Optimization
- Writing Clean Code

Module 15: Mini Projects

- Calculator Program
- Student Management System
- File-based Data Storage
- Pattern Printing Programs