Brainware Computer Academy
Programming With C
(Specially Designed for WBCHSE, CBSE, ICSE & ISC)

Duration: 24 Sessions / 48 Hours / 8 Weeks

Class logistics: 3 Sessions (6 Classes) a week.

(6 Hours each week. A "Session" comprises of 1 theory class & 1 p ractical class of 1 hour each)

Session-wise Syllabus:

Session 1: Programming Logic and Techniques (2 Hours Theory Only)
Introduction to Programming
Needs of Programming
Low-level Language
High Level Language
Compiler, Interpreter
Source code, Object code
Procedural Language
Object Oriented Programming
Algorithm
Expressing an Algorithm
- Pseudocode
- Flow Chart

Demonstrate the examples of Pseudocode and Flow Chart from PLT handout

C Programming

Session 2: Introduction to C Programming Language
History of 'C'
Describe 'C' program structure
Sample program to display 'Hello World'
Data types, Constants, Variable & Keywords

Session 3: Operators
Arithmetic Operator and Expression
Hierarchy of arithmetic operations
'printf' statements with escape sequences (\n, \t) and 'scanf' statements
Pre and post increment operators

Session 4: Operators and Control Statements Contd…
Decision making with IF statement
Multiple statements within IF
Relational operators, logical operators
IF-ELSE statement

Session 5: Control Statements Contd…
Nested IF-ELSE
Switch-case with break

Session 6: Loop in 'C'

Concepts of Loop
- While statement
- Do while loops
- For statement

Session 7: Loop in 'C' continued
Multiple initializations in FOR loop
'break' and 'continue' statements
Nesting of loops

Session 8: I/O statements revisited
I/O revisited with several escape sequences
- Formatted I/O using format specifications strings with examples getchar(), putchar()

Session 9: Array in 'C'
Concept of array
Array declaration, initialization & Accessing Array Elements

Session 10: Array in 'C' continued
Two-dimensional array declaration, initialization, manipulation
Concept of string (character array)
- Declaring and initializing string variables
- Reading strings from terminal
- Writing string to screen

Session 11: Pointer in 'C'
Introduction to pointer
- Declaration, Initialization
- Accessing address of a variable
- Accessing variable through its pointer

Session 12: Pointer in 'C' continued
Dynamic memory allocation with pointers (malloc, calloc)
Pointer arithmetic
Comparison between Array and Pointer

Session 13: Pointer in 'C' continued
Using array and Pointer interchangeably
Manipulation of 2 dimensional array using pointer

Session 14: Function
Function: Need of functions
Declaring functions prototype
Defining a function
Calling a function - Without arguments
Scope of variables (Local, Global)
Use of 'extern'

Session 15: Function Continued
Calling a function - With arguments
- Call by value
- Call by reference

Session 16: Function Continued

Passing array to functions
Functions returning values
Functions returning address

Session 17: String Revisited
String Manipulation functions (strcpy, strlen, strcat, gets, puts etc.)
User Defined String Manipulation Functions

Session 18: Structure
Defining a structure
Accessing structure elements
Uses of structure
Type casting
Structure within structure

Session 19: Structure Continued
Array of structure
Pointer to a structure
Passing structures to functions

Session 20: Structure Continued
Introduction to Data Structure
Programming Linked Lists

Session 21: Unions and other User Defined Data types
Unions
Enum
Typedef
Macro and preprocessor directives

Session 22: File Handling in 'C'
File Handling using 'C'
Defining, Opening and Closing a files
Concepts of file pointer, fopen, fclose, feof
Input/Output operation of files using putc, getc

Session 23: File handling in 'C' continued
Input/Output operation of files using fprintf, fscanf
Command line arguments - argc, argv

Session 24: File Handling in 'C' contuinued
Block reading and block writing: fread, fwrite, fseek, feof etc.