TECHNOLOGY LEARNING CENTER

..Finishing School for Engineer's

Course Brochure

C' with Data Structures

Overview

In computing, **C** is a general-purpose computer programming language originally developed in 1972 by Dennis Ritchie at the Bell Telephone Laboratories for use with the Unix operating system. Although C was designed for implementing system software, it is also used for developing application software. It is widely used on a great many different software platforms and computer architectures, and several popular compilers exist. C has greatly influenced many other popular programming languages.

Pre-requisites

Knowledge of any Operating System preferable.

Applications

COURSE CONTENTS

Introduction to Computers & Programming

- ❖ Hardware &and Software.
- ❖ What is a Program?
- ❖ What is programming language?
- ❖ Steps in Programming
- ❖ Operating System
- ❖ Skills needed to do programming
- ❖ Block Diagram & I/O Devices
- ❖ Different Programming Techniques
- ❖ Computer Generations
- ❖ Procedural Programming
- ❖ Modular Programming
- ❖ Getting started with compiler

Introduction to Computers & Programming

- ❖ History of C and Features
- ❖ Algorithms
- ❖ Flowcharts
- ❖ Language and Generation of Languages

Basics in 'C'

- ❖ Character Set
- ❖ Identifiers
- ❖ Variables
- ❖ Constants
- ❖ Keywords
- ❖ Basic Data types in 'C'
- ❖ Declaration of Variables
- ❖ C program structure
- ❖ Execution of 'C' program under Linux/Unix

C Operators:

- ❖ Operators- introduction
- ❖ Classification
  - ▪ Unary
  - ▪ Binary
  - ▪ Ternary
  - ▪ Special Operators
- ❖ Order of Evaluation

Control Statements

- ❖ If
- ❖ If-else
- ❖ If-else-If
- ❖ Nested if-else
- ❖ Switch case statement

Loop Control Instructions

- ❖ For loop
- ❖ While loop
- ❖ Do ... while loop
- ❖ Break and continue statement

String Manipulation

- ❖ What are strings?
- ❖ String I/O
- ❖ String Formatted Specifiers
- ❖ String Manipulation Functions
- ❖ gets() and puts()

Arrays:

- ❖ What is an array?
- ❖ Rules of using array
- ❖ Array Declaration
- ❖ Array Initialization
- ❖ Accessing individual elements of an array
- ❖ Types of Arrays
  - ▪ Single Dimensional Arrays
  - ▪ Two Dimensional Arrays
  - ▪ Multi Dimensional Arrays

Pointers

- ❖ What is a pointer?
- ❖ Declaring a pointer Variable
- ❖ Initializing a pointer Variable
- ❖ Using pointer Variables
- ❖ Pointer Arithmetic
- ❖ Why use pointers

COURSE CONTENTS

- ❖ Array of Pointers & pointer to array
- ❖ Passing an entire array to a function
- ❖ Functions returning a Pointer Variable
- ❖ Pointers to pointers
- ❖ Call by value and call by reference
- ❖ Pointer with Structures
- ❖ Dynamic memory allocation

Structures and Unions

- ❖ Introduction to Structures
- ❖ Arrays of Structures
- ❖ Nested Structure
- ❖ Structures and functions
- ❖ Pointers with Structures
- ❖ Introduction to Union
- ❖ Declaring Union
- ❖ Difference between Structure and Union
- ❖ Type def
- ❖ Preprocessor and Macro
- ❖ Enumerations

Functions

- ❖ Why use Functions
- ❖ Components of Function
  - ▪ Name of a function
  - ▪ Body of a function
  - ▪ Calling a function
- ❖ Local variables of a function
- ❖ Parameters or Arguments to a function
- ❖ Function with arrays
- ❖ Return Values
- ❖ Function with Strings
- ❖ Rules of using a function
- ❖ Recursive Functions
- ❖ What is Header File?
- ❖ How to create User defined header files

Storage Classes

- ❖ Automatic
- ❖ Register
- ❖ Static
- ❖ Etern

File Handling

- ❖ Introduction to files
- ❖ File Pointer
- ❖ Opening a File
- ❖ Closing a File
- ❖ Types of files
- ❖ File input, Output Operators
- ❖ Seeking in a file
- ❖ Sequential Files
- ❖ Random access files
- ❖ Command Line Arguments
- ❖ File Handling errors

DATA STRUCTURES:

Linear Data Structures

Stacks

- ❖ Using Arrays
- ❖ Using structures & Pointers
- ❖ Conversions from Infix to postfix & prefix expressions

Queues

- ❖ Linear Queue
  - ▪ Using Arrays
  - ▪ Using structures and pointers
- ❖ Circular Queues
- ❖ De Queues
- ❖ Priority Queues

Linked List

- ❖ Single or singly Linked List
- ❖ Dlouble or Doubly Linked List
- ❖ Circular Linked List
- ❖ Header Linked List
- ❖ Stacks using Linked List
- ❖ Queues using Linked List

COURSE CONTENTS