

20HS005 PROGRAMMING IN C

Hours Per Week :

| L | T | P | C |
|---|---|---|---|
| 4 | - | - | 4 |

COURSE DESCRIPTION AND OBJECTIVES:

This course is aimed at offering fundamental concepts of programming language to the students. It starts with the basics of C-programming and deals with the structure and various attributes required for writing a 'C' program. It also introduces various operators and control statements used in programming. Then it switches to functions and arrays. It goes on with strings, pointers, files and the user defined data types. As a first-level course in computer science, it forms the basis to understand usage of various attributes in writing a program.

COURSE OUTCOMES:

The student will be able to:

| COs | Course Outcomes | POs |
|-----|---|-----|
| 1 | Understanding of how to write simple, but complete C programs. | |
| 2 | Identification of suitable data types for operands and design of expressions having right precedence. | |
| 3 | Application of decision making and iterative features of C Programming language effectively. | |
| 4 | Design and development of problem specific data structures and accessing methods to build large modular programs. | |
| 5 | Development of C programs that are understandable, debuggable, maintainable and more likely to work correctly in the first attempt. | |

UNIT I

Introduction to Algorithms and Programming Languages: Algorithm – Key features of Algorithms – Some more Algorithms – Flow Charts – Pseudo code – Programming Languages – Generation of Programming Languages – Structured Programming Language.

Introduction to C: Introduction – Structure of C Program – Writing the first C Program – File used in C Program – Compiling and Executing C Programs – Using Comments – Keywords – Identifiers – Basic Data Types in C – Variables – Constants – I/O Statements in C – Operators in C – Programming Examples – Type Conversion and Type Casting

UNIT II

Decision Control and Looping Statements: Introduction to Decision Control Statements – Conditional Branching Statements – Iterative Statements – Nested Loops – Break and Continue Statement – goto Statement

Functions: Introduction – using functions – Function declaration/ prototype – Function definition – function call – return statement – Passing parameters – Scope of variables – Storage Classes – Recursive functions – Type of recursion – Recursion vs Iteration

UNIT III

Arrays: Introduction – Declaration of Arrays – Accessing elements of the Array – Storing Values in Array – Calculating the length of the Array – Operations on Array – one dimensional array for inter-function communication – Two dimensional Arrays – Operations on Two Dimensional Arrays - Two Dimensional Arrays for inter-function communication – Multidimensional Arrays – Sparse Matrices

Strings: Introduction – Suppressive Input – String Taxonomy – String Operations – Miscellaneous String and Character functions.

UNIT IV

Pointers: Understanding Computer Memory – Introduction to Pointers – declaring Pointer Variables – Pointer Expressions and Pointer Arithmetic – Null Pointers – Generic Pointers – Passing Arguments to Functions using Pointer – Pointer and Arrays – Passing Array to Function

– Difference between Array Name and Pointer – Pointers and Strings – Array of pointers – Pointer and 2D Arrays – Pointer and 3D Arrays – Pointers to Pointers – Memory Allocation in C Programs – Memory Usage – Dynamic Memory Allocation – Drawbacks of Pointers

UNIT V

Structure, Union, and Enumerated Data Types: Introduction – Nested Structures – Arrays of Structures – Structures and Functions – Self referential Structures – Union – Arrays of Unions Variables – Unions inside Structures – Enumerated Data Types

Files: Introduction to Files – Using Files in C – Reading Data from Files – Writing Data from Files – Detecting the End-of-file – Error Handling during File Operations – Accepting Command Line Arguments – Functions for Selecting a Record Randomly - Remove() – Renaming a File – Creating a Temporary File

TEXT BOOK:

1. A. Mittal, "Programming in C - A Practical Approach", Pearson Education, India, 2015

REFERENCE BOOKS:

1. R. Thareja, "Introduction to C Programming", 2nd edition, Oxford University, Press India, 2015.
2. C. H. Schildt, "The Complete Reference", 4th edition, Tata McGraw-Hill, 2000.
3. E. Balagurusamy, "Programming in ANSI C", 4th edition, Tata McGraw-Hill, 2008.