ANURAGENGINEERINGCOLLEGE

(AnAutonomousInstitution)

(CS103ES)PROGRAMMINGFORPROBLEMSOLVING

I Year B.Tech. IT- I Sem **L-T-P-C**

3-0-0-3

Course Objectives:

The objectives of this course is to provide:

- To understand the various steps in program development.
- To learn the syntax and semantics of the C programming language.
- To learn the usage of structured programming approaches in solving problems.
- Develop Skills for analyzing solutions.
- To introduce various techniques for representation of the data in the real world

Unit-I:IntroductiontoProgramming

Compilers, compiling and executing a program.

Representation of Algorithm - Algorithms for finding roots of a quadratic equations, finding minimum and maximum numbers of a given set, finding if a number is prime number Flowchart/Pseudocode with examples, Program design and structured programming

Introduction to C Programming Language: variables (with data types and space requirements), Syntax and Logical Errors in compilation, object and executable code, Operators, expressions and precedence, Expression evaluation, Storage classes (auto, extern, static and register), type conversion,The main method and command line arguments Bitwise operations: Bitwise AND, OR, XOR and NOT operators

Conditional Branching and Loops: Writing and evaluation of conditionals and consequent branching with if, if-else, switch-case, ternary operator, go to, Iteration with for, while, do- while loops

I/O: Simple input and output with scanf and printf, formatted I/O, Introduction to stdin, stdout and stderr. Command line arguments

Unit-II: Arrays, Strings, Structures and Pointers:

Arrays: one and two dimensional arrays, creating, accessing and manipulating elements of arrays Strings: Introduction to strings, handling strings as array of characters, basic string functions available in C (strlen, strcat, strcpy, strstr etc.), arrays of strings

Structures: Defining structures, initializing structures, unions, Array of structures

Pointers: Idea of pointers, Defining pointers, Pointers to Arrays and Structures, Use of Pointers in self- referential structures, usage of self-referential structures in linked list (no implementation) Enumeration data type

Unit–III: Preprocessor and File handlingin C:

Preprocessor: Commonly used Preprocessor commands like include, define, undef, if, ifdef, ifndef Files: Text and Binary files, Creating andReading and writing text and binary files, appending data to existing files, Writing and reading structures using binary files, Random access using fseek, ftell and rewind functions

Unit-IV: Function and Dynamic Memory Allocation:

Functions: Designing structured programs, declaring a function, Signature of a function, Parameters and return type of a function, passing parameters to functions, call by value, Passing arrays to functions, passing pointers to functions, idea of call by reference, Some C standard functions and libraries

Recursion: Simple programs, such as Finding Factorial, Fibonacci series etc., Limitations of Recursive functions Dynamic memory allocation: Allocating and freeing memory, Allocating memory for arrays of different data types

Unit –V:

Searching and Sorting:

Basic searching in an array of elements (linear and binary search techniques), Basic algorithms to sort array of elements (Bubble, Insertion and Selection sort algorithms), Basic concept of order of complexity through the example programs

Text Books:

1. Jeri R. Hanly and Elliot B.Koffman, Problem solving and Program Design in C

7th Edition, Pearson

2. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition)

Reference Books:

1. Brian W.KernighanandDennis M.Ritchie, TheC ProgrammingLanguage,PrenticeHall of India
2. E.Balagurusamy,ComputerfundamentalsandC,2ndEdition,McGraw-Hill
3. YashavantKanetkar,LetUsC,18thEdition,BPB
4. R.G.Dromey,Howto solveitbyComputer, Pearson(16thImpression)
5. ProgramminginC,StephenG.Kochan,FourthEdition,PearsonEducation.
6. HerbertSchildt,C:TheCompleteReference,McGrawHill,4thEdition
7. ByronGottfried,Schaum'sOutlineofProgrammingwithC,McGraw-Hill

Course Outcomes:

After the completion of the course, the student will be able to

1. Design algorithms,flow charts and programs involving decision and iteration structures.
2. Analyze the concepts of arrays,strings and structures for real world problems.
3. Apply various file handling techniques for better data management.
4. Apply the concept code reusability using Functions.
5. Implement various searching and sorting Techniques.

CO-PO-PSO Mapping:

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	M	M	L	L									H	L	
CO-2	L	M	M	H									H	L	
CO-3	L	M	M	H									M	L	
CO-4	L	M	M	M									M	L	
CO-5	L	M	H	H									M	L	

H-HIGH **M**-MODERATE **L**-LOW