CSE101:COMPUTER PROGRAMMING

L:2 T:0 P:2 Credits:3

Course Outcomes: Through this course students should be able to

- discuss problem solving through programming in C language
- write their own programs using standard language conventions irrespective of the underlying compilation environment
- discuss the mechanism of code reusability by creating their own libraries of functions
- complete use pointers with functions and implementation of basic data structures
- relate the theoretical knowledge and insights gained to formulate working code
- validate the logic building and code formulation by designing code capable of passing various test cases

Unit I

Basics and introduction to C : Program development in C, structured programming using algorithm and flow chart, The C character set, Identifiers and keywords, Data types, Constants and variables, Expressions, Arithmetic operators, Unary, Relational, Logical, Assignment and conditional operators, Bitwise operators

Unit II

Control structures and Input/Output functions : If, If else, Switch case statements, While, For, Do-while loops, Break and continue statements, Goto, Return, Type conversion and type modifiers, Designing structured programs in C, Formatted and unformatted Input/Output functions like printf(), Scanf(), Puts(), Gets() etc,

Unit III

User defined functions,Storage classes and clean coding : Function prototypes, Function definition, Function call including passing arguments by value and passing arguments by reference, Math library functions, Recursive functions, Scope rules (local and global scope), Storage classes in C namely auto, Extern, Register, Static storage classes, clean coding for better programming(need, benefits and principles of clean coding)

Unit IV

Arrays in C : Declaring and initializing arrays in C, Defining and processing 1D and 2D arrays, Array applications, Passing arrays to functions, inserting and deleting elements of an array, Searching including linear and binary search methods, Sorting of array using bubble sort

Unit V

Pointers, Dynamic memory allocation and Strings : Pointer declaration and initialization, Types of pointers - dangling , wild, null, generic (void), Pointer expressions and arithmetic, Pointer operators, Operations on pointers, Passing pointer to a function, Pointer and one dimensional array, Dynamic memory management functions (malloc, calloc, realloc and free), Defining and initializing strings, Reading and writing a string, Processing of string, Character arithmetic, String manipulation functions and library functions of string

Unit VI

Derived types including structures and unions, SOLID for better software development : Declaration of a structure, Definition and initialization of structures, Accessing structures, Structures and pointers, Nested structures, Declaration of a union, Definition and initialization of unions, Principles of SOLID(SRP,OCP,LSP,ISP,DIP)

Text Books:

1. PROGRAMMING IN C by ASHOK N. KAMTHANE, PEARSON

References:

1. PROGRAMMING IN ANSI C by E. BALAGURUSAMY, MCGRAW HILL EDUCATION

2. C HOW TO PROGRAM by PAUL DEITEL AND HARVEY DEITEL, PRENTICE HALL