1/4 B.Tech - FIRST SEMESTER

EC1T5 **C Programming** **Credits: 4**

Lecture : 4 periods/week **Internal assessment: 30 marks**
Tutorial: 1 period /week **Semester end examination: 70 marks**

Course Objectives:

- Learn preprogramming steps like writing algorithms, drawing flowcharts.
- Understand the structure, and learn the syntax and semantics of C programming.
- Learn variable declaration with different data types and using operators.
- Learn different control structures like decision control, loop control and special cases.
- Learn the concepts and advantages of using functions.
- Understand the limitations of basic data types and learn the concepts of derived data types and user defined data types.
- Learn how to perform various FILE I/O.

Learning Outcomes:

- To obtain the knowledge about the number systems this will be very useful for bitwise operations.
- To develop programs using the basic elements like control statements, Arrays and Strings.
- To solve the memory access problems by using pointers
- To understand about the dynamic memory allocation using pointers which is essential for utilizing memory?
- To understand about the code reusability with the help of user defined functions and pointers.
- To develop advanced applications using enumerated data types, function pointers and nested structures.
- To learn the basics of file handling mechanism that is essential for understanding the concepts in database management systems.
- To develop programs using command line arguments.
- To understand the uses of preprocessors and various memory models.

UNIT –I:

Basics and Introduction to C: Basics of Computer, Introduction to C, About ANSI C Standard, Machine, Assembly and High-level Language, Assembler, Compiler and Interpreter, Structure of a C program, Programming Rules, Executing the C Program, Standard Directories, Advantages of C, Header Files, Flow Chart, Algorithm, Analyzing Algorithm, Classification Algorithms.

The C Declarations: The C-Character set, Delimiters, Types of Tokens, The C keywords, Identifiers, Constants, Variables, C Data types, dynamic initialiasation, type modifiers, type conversions, constant and volatile variables.

UNIT-II:

Operators and expressions: Properties of Operators, Operator Priority ,comma and conditional operators, arithmetic, relational, assignment operators and expressions, logical , bitwise operators.

Input and output in c: Formatted and Unformatted functions, Library functions.

UNIT-III:

Decision statements: The if statement, it-else, nested if else, if-else-if ladder, break, continue, goto, Switch statement, nested switch case, Switch case and nested ifs.

Loop control: for loop, nested for loop, while, do-while, do-while statement with while loop.

UNIT-IV:

Arrays: Array initialization, array terminology, characteristics of an array, 1-D array and its operations, predefined streams, 2-D arrays and operations, Multi -dimensional arrays.

Strings: Declaration and initialization of string, string standard functions, string conversion functions, memory functions, application of strings.

UNIT-V:

Pointers: Features of pointers, pointers and address, pointer declaration, void pointers, arithmetic operations with pointers, pointers and arrays, array of pointers, pointers to pointers, pointers and strings.Dynamic memory allocation, memory models, memory allocation functions.

UNIT-VI:

Functions: Basics, function definition, return statement, types of functions, call by value ,call by reference, function as an argument, Functions with operators, Function and Decision Statements, Functions and loop Statements, Functions with arrays and Pointers, Recursion-Types of Recursion, Rules for Recursive Function, Recursion versus Iterations, Advantages and Disadvantages of Recursion, Efficiency of Recursion, Library Function.

Storage Class: Variable Lifetime,Automatic Variables, External Variables, Static Variables, Register Variables.

UNIT-VII:

Preprocessor Directives: The #define Directive, Undefining a Macro, Token Pasting and Stringizing Operators, The #include Directive, Conditional Compilation, The #ifndef Directive, The #error Directive, The #line Directive, The #pragma Directive, The #pragma inline Directive, The #pragma Directive, The Predefined Macros in ANSI and Turbo-C,Standard I/O Predefined Streams in stdio.h, The Predefined Macros in ctype.h, Assertions,

Structure and Union: Features of Structures, Declaration and initialization of Structures, Structure within Structure, Arrays of Structure, Pointer to Structure, Structure and functions,typedef,Bit fields, Enumerated Data Type, Union, Union of Structures.

UNIT-VIII

Files: Streams and File Types, Steps for File Operations, FILE I/O,Structures Read and Write, Other file function, Command line Arguments, Application of command line arguments, Environment variables,

Learning Resources

Text Books:

1. Programming in C ,Ashok N.Kamthane Pearson Publications,2nd Edition, 2011

References:

1. Programming in ANSI C, E.Balaguruswamy, Tata McGraw-Hill, 5th Edition, 2010.
2. A first book of ANSI C, Gray J.Bronson, Cengage Learning India Pvt.Ltd., 3rd edition, 2005
3. Problem Solving with C, M.T Somashekara, PHI Learning, 2009
4. C Programming Language, Brain W.Kernighan & Dennis Ritchie, PHI, 2nd ed., 1988.