1/4 B.Tech. SECOND SEMESTER

EE2T6 C PROGRAMMING Credits: 3

Lecture: 3 periods/week Internal assessment: 30 marks

Tutorial: 1 period /week Semester end examination: 70 marks

Course Objectives:

- Learn the structure, syntax and semantics of C programming.
- Learn different control structures like decision control, loop control and arrays.
- Learn the modular programming concepts and storage classes.
- Learn the limitations of basic data types and learn the concepts of derived data types and user defined data types.
- Learn how to perform various FILEI/O.

Course Outcomes:

After completion of this course the student would be able to:

1. Understand the fundamentals of C programming.
2. Choose the decision making statements, loops and arrays to solve the problem.
3. Use functions to solve the given problem.
4. Allocate dynamic memory using pointers.
5. Apply the structures, unions and files Operations in a specific need.

UNIT I

TOPIC LEVEL OBJECTIVE: Notion of Computer Languages, algorithm, computational procedure, editing and executing programs and C Declarations.

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 initialization, type modifiers, type conversions, constant and volatile variables. 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.

UNIT II

Topic Level Objective: Understanding branching, iteration, data representation using arrays and strings.

DECISION STATEMENTS:

The if statement, if-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.

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 III

Topic Level Objective: Modular programming and recursive solution formulation and storage classes.

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 Functions.

STORAGE CLASS: Variable Lifetime, Automatic Variables, External Variables, Static Variables, Register Variables.

UNIT IV

Topic Level Objective: Understanding pointers, dynamic memory allocation and Preprocessor Directives.

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.

PREPROCESSOR DIRECTIVES:

The #define Directive, Undefining a Macro, Token Pasting and Stringizing Operators, The #include Directive, Conditional Compilation, The Predefined Macros in ANSI and Turbo-C,Standard I/O Predefined Streams in stdio.h, The Predefined Macros in ctype.h.

UNIT V

Topic Level Objective: Understanding derived data types of C and basic of file operations.

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.

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 Book:

Programming in C, by Ashok N.Kamthane, (2nd edition), Pearson publications, 2011.

Reference Books:

1. Programming in ANSI C (5th Edition) by E.Balaguruswamy, McGraw-Hill publications.
2. "A first book of ANSI C", 3rd edition, by Gray J.Brosin, cengagedelmar Learning India P.ltd publications.
3. Problem Solving with C by M.T Somashekara PHI publications.
4. C Programming Language", (2nd edition) by Brain W.Kernighan & Dennis Ritchie, ", PHI publication.

Web Resources:

1. http://nptel.ac.in/courses.php
2. http://jntuk-coeerd.in/