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| **B. TECH 1st SEMESTER** | **L** | **T** | **P** | **C** |
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| **16CS1T01: Fundamentals of Computers and C Programming**  |

**Prerequisites**

Basic Mathematical Problems and their Solutions

**COURSE OBJECTIVES**

* 1. To enable the student to learn about the major components of a computer system.
	2. To introduce the basic structure of the Algorithm and Flowchart.
	3. To know the concepts of conditional & loop statements.
	4. To implement the different user defined and pre-defined functions.
	5. To know the pointers, structures and unions concept used in various areas.
	6. To provide practical, hands-on training in C programming.

**COURSE OUTCOMES**

**The student will be proficient in the following:**

* 1. Identification and Usage of each part of a computer system.
	2. The Evolution and Purpose of Programming.
	3. Mastering in basic programming concepts and logic implementations.
	4. Knowledge in file I/O operations (i.e. open, close, read, write, seek)
	5. Ability to identify and implement appropriate Solution for a given Problem.
	6. Know the terms "Structured Programming", “Algorithm” ,”Flowchart” ,"Data Types", “Control Statements”, “Arrays”, “Functions” , “Pointers”, “Structures”, “Unions”, ” File I/O” and where they are applicable.

**Syllabus**

**UNIT-I COMPUTER FUNDAMENTALS**

**Computer System:**definition, block diagram,**Hardware:**components, mother board layout,block diagram of mother board,**Software:**definition,types of software, **Algorithm:** definition, properties of algorithm, algorithms on basic problems,**Flowchart:** definition, symbols used in flow charts, flow charts for basic problems,types of computer Languages, bits, bytes,binary system.

**UNIT-II FUNDAMENTALS OF C LANGUAGE**

Character Set, Tokens, Identifiers,Constants,Basic Data Types and Sizes,Arithmetic Operators, Relational Operators, Logical Operators, Conditional Operator, Increment and Decrement Operators, Assignment Operators, Bit-wise Operators, Special Operators, Expressions, Operator Precedence and Order of Evaluation, Evaluation of Expressions, Type Conversions: Implicit and Explicit, Structure of C Program.

**UNIT-III CONTROL STRUCTURES**

**Selection Statements**: Simple if, if-else Statement, Nested ifStatement, else-ifLadder, switch Statement.

**Iterative Statements**: while, do-while and for loops, break and continue statements, goto statement.

**Arrays**

Array definition, declaration, initialization and accessing array elements of 1-D and2-D arrays.

**STRINGS**

String definition, declaration, initialization and accessing, string handling functions in **string.h**

**UNIT-IV FUNCTIONS**

Introduction to Function, Types of Functions, Return Statement,Declaration, Definition and Calling a Function, Parameter Passing Techniques,Storage Classes, Passing 1-D Array to Functions.

**Recursion**: Types of recursion, rules of recursion, recursive solutions for factorial of a number, Fibonacci Series and GCD of two numbers.

**C Preprocessors**: File Inclusion and Macro Substitution.

**UNIT-V POINTERS**

Pointer Definition, Declaration, Initialization and Accessing a Pointer, void pointer, null pointer, Pointer Arithmetic, Pointer to Pointer, Dynamic Memory Management Functions.

**STRUCTURES AND UNIONS**

Definition, Declaration and Initialization of Structures, Accessing Structures, Nested structures, Array of Structures, Pointer to structures

Definition, Declaration and Initialization of Unions, difference between structures and unions

**UNIT-VI FILES**

Introduction to Files, File I/O functions, File opening modes, sequential and random accessing files, file operations.

**Text Books**

1. Programming in ANSI C E. Balagurusamy TMH

**Reference Books**

1. Programming with ANSI and Turbo C Ashok N. Kamthane Pearson
2. Let us C YashwantKanetkar BPB
3. The C Programming Language Kernighan & Ritchie PHI
4. Programming in C PradipDey&ManasGhosh Oxford