Semester: II **Branch: Computer Science & Engineering**
Subject: Computer Fundamentals & Basic Computing **Code: CSE1201**

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Course Description: This course is designed to introduce the concepts of basic computing and C programming. To provide an overview of computer algorithms and problem solving techniques. Emphasis is given to the processing of command line arguments and environment variables so students will be able to write flexible, user-friendly programs.

Course Objectives:

1. To understand the basic building blocks of computer.
2. To gain an insight about algorithms and flowcharts.
3. To impart knowledge and skill on the need of problem solving techniques.
4. Developing programming skills using the fundamentals of C Language.
5. To introduce 'C' Language that serves as a corner stone for the study of different programming languages.

Course Detail:

Unit-1: Computer Basics 8 Hours

Introduction to Computers: Basic Concepts, Evolution, Computer Organization ,Peripheral Devices, Software – System Software, Application Software, Computer Languages – Low Level, Machine Level and High Level Languages, Compiler and Assembler , Microprocessors, Memory, Technological Trends.

Algorithms and Flow Chart: Algorithm and its characteristics, flowchart, Algorithm involving Decisions and Loops, Problem solving methods. Pseudo code, top down & bottom up approaches of program design

Unit-2: Preliminary Concepts 6 Hours

Introduction to C: History of C, Features of C Language, Structure of a C program, Basic Input Output Execution of C Program- Compiling, Linking, debugging and running a program.

Variables, Constants and Operators: C character set – Tokens , Constants Keywords, identifiers and Variables. Data types – Data type Qualifiers, Declaration of variables, Arithmetic, Logical, Assignment, Relational, Increment and Decrement, Conditional, Bit wise, Special Operator. Precedence and Associativity.

Unit-3: Looping and Functions **08 Hours**

Branching & Looping: Introduction – Simple if statement, if-else, else-if ladder, nested if-else, Switch statement, go to statement. Loops - while, do-while, for loop, nested loops infinite loops

Functions: Introduction to functions – Declaration, definition and calling of function, Function arguments and return value, scope and life time of variables, call by value, call by reference. Storage classes. Recursion. Library functions.

Unit-4: Array & Pointers **10 Hours**

Arrays: Declaration and initialization of one dimensional, two dimensional and character arrays, accessing and manipulating array elements, array applications - matrix operations, searching, sorting. String manipulations.

Pointers: Pointers concepts, pointers and function arguments, pointer arithmetic.

Unit-5: Structures and File Handling **08 Hours**

Structure: structure declaration, definition, initialization and accessing. Structure Assignment, Nested Structure, Structures and Functions, Structures and arrays.

File Handling: Concept of a file – Data Organization, reading, writing, manipulating and troubleshooting, file types, file opening modes.

Course Outcome:

At the end of the course, the student would be able to:-

1. Obtain the knowledge about the number systems this will be very useful for bitwise operations.

2. Write, compile and debug programs in C language.

3. Use different data types in a computer program.

4. Develop programs using various features like control statements, Functions, Arrays

   Strings, File, Pointer, Structure etc.

5. Implement solutions of various practical problems using C Programming.

Text Books

1. Raja Raman V., "Fundamental of Computers" (4th edition.), Prentice Hall of India, New Delhi.
2. “Let us C” by Yashvant Kanetkar, BPB Publications.
3. “C Programming Language” by B. W. Kernighan & D.M. Ritchie.
4. “Programming with C (SCHAUM’s Outlines Series)” by Byron Gottfried.

Reference Books:

1. Norton, Peter, “Introduction to Computers”, Mc-Graw-Hill.
2. “C Programming: A Problem - Solving Approach” by Forouzan, E. V. Prasad, Giliberg, Cengage, 2010.
3. “Programming in C” by Stephen G. Kochan, 3/e Pearson, 2000