Name of Department:- Computer Science and Engineering

1. Subject Code: TCS 101 Course Title: FUNDAMENTALS OF COMPUTERS AND INTRODUCTION TO PROGRAMMING
2. Contact Hours: L: 3 T: - P: -
3. Semester: I

4. Pre-requisite: Basic Knowledge of Mathematics

5. Course Outcomes: After completion of the course students will be able to

1. Learn the concepts of IT and understand the fundamentals of basic building blocks of computer science.
2. Understand basic data types and syntax of C programming. .
3. Propose solution to problem by using tools like algorithm and flowcharts.
4. Analyze and select best possible solution for decision-based problems using decision making skills.
5. Develop the aptitude to solve iterative problems using different types of looping statements.
6. Implement complex problem as a collection of sub problems by applying modularization in applications using functions.

6. Detailed Syllabus

UNIT	CONTENTS	Contact Hrs
Unit - I	Generation of computers, Computer system memory hierarchy, Input/Output, RAM/ROM, Software & Hardware, Understand bit, byte, KB, MB, GB and their relations to each other, Operating System overview, Computer Networks Overview Algorithms and Flow Charts – Examples of Flow charts for loops and conditional statements	**8**
Unit - II	First C program - Hello world, How to open a command prompt on Windows or Linux How to read and print on screen - printf(),scanf(),getchar(), putchar() Variables and Data types - Variables, Identifiers, data types and sizes, type conversions, difference between declaration and definition of a variable, Constants Life of a C program (Preprocessing, Compilation, Assembly, Linking, Loading, Execution), Compiling from the command line, Macros, Operators – equality and assignment, Compound assignment operators, Increment and decrement operators, Performance comparison between pre and post increment/decrement operators, bitwise operators (AND, OR, NOT and XOR), Logical Operators, comma operator, precedence and associativity, Logical operators	**10**

	(AND, OR),	
Unit – III	Conditional statements (if statement, if-else statement, ternary statement or ternary operator, nested if-else statement, switch statement), Difference between performance of if else and switch, Advantages of if else and switch over each other Loops – 'for' loops, 'while' loops, 'do while' loops, entry control and exit control, break and continue, nested loops	**8**
Unit – IV	Arrays –Single and Multi-dimensional arrays, Initializing arrays, computing address of an element in array, row major and column major form of an array, character strings and arrays, segmentation fault, bound checking, Sorting Algorithms – Bubble sort, insertion sort, selection sort	**10**
Unit – V	**Functions** – Function prototype, function return type, signature of a function, function arguments, call by value, Function call stack and Activation Records, Recursion v/s Iteration, passing arrays (single and multi-dimensional) to functions, **Storage classes-** Automatic, Static, Register, External, Static and Dynamic linking implementation, C program memory (show different areas of C program memory and where different type of variables are stored), scope rules	**7**
	Total	**43**

Text Books:

- Peter Prinz, Tony Crawford,"C in a Nutshell", 1stEdition, Oreilly Publishers, 2011.
- Peter Norton, "Introduction to computers", 6thEdition, TMH, 2009.

Reference Books:

- Steve Oualline, "Practical C programming", 3rdEdition, Orielly Publishers, 2011.
- Brian W Kernighan, Dennis M Ritcie,"The C Programming Language", 2ndEdition, Prentice Hall, 1988. R3. Herbert Schildt," C: The Complete Reference", 4thEdition.TMH, 2000.
- E.Balagurusamy,"Programming in ANSI C",6th Edition, McGraw Hill 2015
- YashwantKanetkar,"Let Us C",8th Edition,BPB Publication 2007