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

- Learn the concepts of IT and understand the fundamentals of basic building blocks of computer science.
- Understand basic data types and syntax of C programming.
- Propose solution to problem by using tools like algorithm and flowcharts.
- Analyze and select best possible solution for decision-based problems using decision making skills and develop the aptitude to solve iterative problems using different types of loopingstatements.
- Apply and implement the concept arrays for providing solution to homogenous collection of data types.
- Implement complex problem as a collection of sub problems by applying modularizationin 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, Logical Operators, comma operator, precedence and associativity.	**10**

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-dimensional arrays, initializing arrays, computing address of an element in array, character arrays, segmentation fault, bound checking, Searching and Sorting.	**7**
Unit V –	**Functions:** Function prototype, function return type, signature of a function, function arguments, call by value, Function call stack, Recursion v/s Iteration, passing arrays 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.	
	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