MSC (CA&IT) - Semester: I

(Effective from year 2023-24)

Course Code:	CAIT-101	Course Title:	Introduction to Computer Science and Programming
Course Credits:	02	Hour of Teaching/Week:	02
Internal Assessment Marks:	25	External Exam Marks:	25
Exam Duration	2 Hrs		

Unit	Contents
1.	Computer Science Introduction, The Basic Model of Computation, Algorithms, Flow-charts and Flow charts symbols, Programming Languages, Compilation, Linking and Loading, Testing and Debugging, Documentation. Problem analysis, program design, algorithm construction. Algorithm and flow charts construction for the problems like odd-even number, prime number, Armstrong number, Factorial problem, Fibonacci Series, Linear search, Binary search problems. Introduction to C Programming: Over View of C; History and Features of C; Structure of a C. Program with Examples; Creating and Executing a C Program; Compilation process in C. C Programming Basic Concepts: C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants. Input and output with C: Formatted I/O functions - printf and scanf, control stings and escape sequences, output specifications with printf functions; Unformatted I/O functions to read and display single character and a string - getchar, putchar, gets and puts functions. C Operators & Expressions: Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associatively; Evaluation of arithmetic expressions; Type conversion.
2.	Control Structures: Decision making Statements - Simple if, if_else, nested if_else, else_if ladder, Switch-case, goto, break & continue statements; Looping Statements - Entry controlled and Exit controlled statements, while, do-while, for loops, Nested loops. Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation. Strings: Declaring & Initializing string variables; String handling functions - strlen, strcmp, strcpy and strcat; Character handling functions - toascii, toupper, tolower, isalpha, isnumeric etc. Pointers in C: Understanding pointers - Declaring and initializing pointers, accessing address and value of variables using pointers; Pointers and Arrays; Pointer Arithmetic; Advantages and

disadvantages of using pointers;

User Defined Functions: Need for user defined functions; Format of C user defined functions; Components of user defined functions - return type, name, parameter list, function body, return statement and function call; Categories of user defined functions - With and without parameters and return type.

User defined data types: Structures - Structure Definition, Advantages of Structure, declaring structure variables, accessing structure members, Structure members initialization, comparing structure variables, Array of Structures; Unions - Union definition; difference between Structures and Unions.

Text Books

1. Pradeep K. Sinha and Priti Sinha: Computer Fundamentals (Sixth Edition), BPB Publication

2. E. Balgurusamy: Programming in ANSI C (TMH)

3. Computer fundamentals and programming in c, "Reema Thareja", Oxford University, Second edition, 2017.

4. Brian W. Kernighan and Dennis M. Ritchie, The 'C' Programming Language, Prentice Hall of India.

References

1. Kamthane: Programming with ANSI and TURBO C (Pearson Education)

2. V. Rajaraman: Programming in C (PHI – EEE)

3. Yashwant Kanitkar: Let us C

Online Resources:

1. https://nptel.ac.in/courses/106/105/106105171/ MOOC courses can be adopted for more clarity in understanding the topics and verities of problem solving methods.

External Exam Format : As per Table 1.1, 1.2 and 1.3

MSC (CA&IT) - Semester: I
(Effective from year 2023-24)

Course Code:	CAIT-101-P	Course Title:	Lab: Practical based on CAIT-101
Course Credits:	03	Hour of Teaching/Week:	03
Internal Assessment Marks:	30	External Exam Marks:	70
Exam Duration	3Hrs		

The following activities may be carried out/ discussed in the lab during the initial period of the semester.

1. Basic Computer Proficiency

   a. Familiarization of Computer Hardware Parts

   b. Basic Computer Operations and Maintenance.

   c. Do's and Don'ts, Safety Guidelines in Computer Lab

2. Familiarization of Basic Software – Operating System, Word Processors, Internet Browsers, Integrated Development Environment (IDE) with Examples.

3. Type Program Code, Debug and Compile basic programs covering C Programming fundamentals discussed during theory classes.

List of Sample Programs

1. Write a C Program to read radius of a circle and to find area and circumference

2. Write a C Program to read three numbers and find the biggest of three

3. Write a C Program to demonstrate library functions in math.h

4. Write a C Program to check for prime

5. Write a C Program to generate n primes

6. Write a C Program to read a number, find the sum of the digits, reverse the number and check it for palindrome

7. Write a C Program to read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers

8. Write a C Program to read percentage of marks and to display appropriate message (Demonstration of else-if ladder)

9. Write a C Program to find the roots of quadratic equation (demonstration of switch-case statement)

10. Write a C program to read marks scored by n students and find the average of marks (Demonstration of

single dimensional array)

11. Write a C Program to remove Duplicate Element in a single dimensional Array.

12. Program to perform addition and subtraction of Matrices

13. Write a C Program to find the length of a string without using built in function

14. Write a C Program to demonstrate string functions.

15. Write a C Program to demonstrate pointers in C

16. Write a C Program to check a number for prime by defining isprime( ) function

18. Write a C Program to read, display and to find the trace of a square matrix

19. Write a C Program to read, display and add two m x n matrices using functions

20. Write a C Program to read, display and multiply two m x n matrices using functions

21. Write a C Program to read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters.

22. Write a C Program to Reverse a String using Pointer

23. Write a C Program to Swap Two Numbers using Pointers

24. Write a C Program to demonstrate student structure to read & display records of n students.

25. Write a C Program to demonstrate the difference between structure & union.

External Exam Format : As per Table 1.1, 1.2 and 1.3