



K. S. INSTITUTE OF TECHNOLOGY

An Autonomous Institution under VTU, Approved by AICTE
 Department of Master of Computer Applications
FIRST SEMESTER SYLLABUS

Course: Programming and Problem-Solving in C		Semester	I
Course Code	25MMC101	CIE Marks	50
Teaching Hours/Week (L:P:T)	3:2:0	SEE Marks	50
Total Hours of Pedagogy	40(Theory)+10(Lab)	Total Marks	100
Credits	04	Exam Hours	03
Examination type (SEE)	Theory		

Course Learning objectives:

1. Implement the constructs of C Language.
2. Construct C Programs using basic programming constructs
3. Develop C programs using arrays and strings
4. Organize modular applications in C using functions
5. Integrate pointers and structures in C applications and Execute input/output and file handling in C

Module-1

BASICS OF C PROGRAMMING Introduction to programming paradigms Applications of C Language - Structure of C program - C programming: Data Types - Constants – Enumeration Constants - Keywords Operators: Precedence and Associativity - Expressions – Input / Output statements, Assignment statements Decision making statements - Switch statement - Looping statements – Preprocessor directives - Compilation process

Number of Hours:8

Module-2

ARRAYS AND STRINGS Introduction to Arrays: Declaration, Initialization – One dimensional array Two dimensional arrays - String operations: length, compare, concatenate, copy – Selection sort, linear and binary search.

Number of Hours:8

Module-3

FUNCTIONS AND POINTERS Modular programming - Function prototype, function definition, function call, Built-in functions (string functions, math functions) Recursion, Binary Search using recursive functions –Pointers Pointer operators Pointer arithmetic Arrays and pointers – Array of pointers – Parameter passing: Pass by value, Pass by reference.

Number of Hours:8

Module-4

STRUCTURES AND UNION Structure -Nested structures–Pointer and Structures –Array of Structures Self-referential structures dynamic memory allocation - Singly linked list typedef Union-Storage classes and Visibility

Number of Hours:8

Module-5

FILE PROCESSING Files Types of file processing: Sequential access, Random access Sequential access file - Random access file - Command line arguments.

Number of Hours:8

SL No	Experiments
1	Simulation of a Simple Calculator.
2	An electricity board charges the following rates for the use of electricity: for the first 200 units 80 paise per unit for the next 100 units 90 paise per unit: beyond 300 units Rs 1 per unit. All users are charged a minimum of R 100 as meter charge. If the total amount is more than Rs 400, then an additional surcharge of 15% of total amount is charged. Write a program to read the name of the user, number of units consumed and print out the charges.
3	Implement Binary Search & Linear Search on Integers
4	Sort the given set of N numbers using Bubble sort.
5	Implement Matrix multiplication and validate the rules of multiplication.
6	Write functions to implement string operations such as compare, concatenate, and find string length. Use the parameter passing techniques.
7	Implement using functions to check whether the given number is prime and display appropriate messages. (No built-in math function)
8	Develop a program using pointers to compute the sum, mean and standard deviation of all elements stored in an array of n real numbers
9	Implement structures to read, write and compute average- marks of the students, list the students scoring above and below the average marks for a class of N students.
10	Write a C program to copy a text file to another, read both the input file name and target file name.

Course outcome (Course Skill Set):

At the end of the course the student will be able to:

CO1: Develop simple applications in C using basic constructs

CO2: Design and implement applications using arrays and strings

CO3: Develop and implement modular applications in C using functions and pointers.

CO4: Develop and implement applications in c using structures

CO5: Develop applications in C using files.

Suggested Learning Resources:**TEXT BOOKS:**

1. Reema Thareja, "Programming in C", Oxford University Press, Second Edition, 2016.
2. Kernighan, B.W and Ritchie, D.M, "The C Programming language", Second Edition, Pearson Education, 2015.

REFERENCES:

1. Paul Deitel and Harvey Deitel, "C How to Program with an Introduction to C++", Eight edition Pearson Education, 2018.
2. Yashwant Kanetkar, Let us C, 17th Edition, BPB Publications, 2020.
3. Byron S. Gotfried, "Schaum's Outline of Theory and Problems of Programming with McGraw-Hill Education, 1996.
4. Pradip Dey, Manas Ghosh, "Computer Fundamentals and Programming in C", Second 5. Edition. Oxford University Press, 2013. Pearson Education, 2013
5. Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C", 1st Edition.

Teaching-Learning Process (Innovative Delivery Methods)

The following are sample strategies that educators may adopt to enhance the effectiveness of the teaching- learning process and facilitate the achievement of course outcomes.

1. Lectures with PowerPoint presentations, Interactive discussions and problem-solving sessions, Assignments and quizzes for assessment

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

CIE for the theory component of IPCC

1. Three Tests each of 25 Marks (scaled down to 25)
2. Two assignments each of 10 Marks/One Skill Development Activity of 20 marks (scaled down to 5 marks)
3. Total Marks of three tests and two assignments/one Skill Development Activity added will be CIE for 30 marks.

CIE for the practical component of IPCC

- On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. The 10 marks are for conducting the experiment and preparation of the laboratory record,
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks.
- The Two laboratory test at the end /after completion of all the experiments shall be conducted for 50 marks. The test marks will be scaled down to 10 marks. Sum of Observation and Lab test will be the CIE marks for the laboratory component of IPCC for 20 marks.

SEE for IPCC

- The question paper will be set for 100 marks and marks scored will be scaled down proportionately to 50 marks.
- The question paper will have 2 Parts: Part A and Part B. In part B, each question is set for 16 marks.
- There will be 2 questions from each module in Part A. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.
- The students have to answer 5 full questions in Part B, selecting one full question from each module.

The theory portion of the IPCC shall be for both CIE and SEE, whereas the practical portion will have a CIE component only. Questions mentioned in the SEE paper shall include questions from the practical component).

- The minimum marks to be secured in CIE to appear for SEE shall be the 15 (50% of maximum marks-30) in the theory component and 10 (50% of maximum marks -20) in the practical component. The laboratory component of the IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 04/05 questions to be set from the practical component of IPCC, the total marks of all questions should not be more than the 20 marks.
- SEE will be conducted for 100 marks and students shall secure 40% of the maximum marks to qualify in the SEE. Marks secured will be scaled down to 50. (Student has to secure an aggregate of 50% of maximum marks of the course (CIE+SEE))