FIRST SEMESTER

PROBLEM SOLVING USING COMPUTERS [2 1 0 3] **[Revised Credit System]** **(Effective from the academic year 2022-23)** **FIRST YEAR (COMMON TO ALL BRANCHES)**			
Subject Code	**CSE1051**	**IA Marks**	**50**
Number of Lecture Hours/Week	**03**	**Exam Marks**	**50**
Total Number of Lecture Hours	**36**	**Exam Hours**	**03**
CREDITS – 03			

Course objectives: This course will enable students to,

- Understand the basics of computing and various problem-solving techniques
- Understand and use various programming concepts using C language
- Understand the concepts of modular, pointer and structure programming
- Appreciate the importance of cyber security in the computing world

Module -1	**Teaching Hours**
Introduction to computing 1. Introduction, Computer Organization, early Operating System, Machine, Assembly and High Level language. [1 Hour] 2. History of C, Typical C program development environment. [1 Hour] 3. Problem solving using computers. Idea of Algorithm: steps to solve logical and numerical problems. Representation of Algorithm, Flowchart/Pseudocode with examples. [2 hours] 4. Simple C programs, Syntax and Logical Errors in compilation, object and executable code [1 hour]	**05 Hours**
Module -2	
C language – Types, operators, expressions and control flow 1. Variable names and declarations, Datatypes, sizes and constants. [1 Hour] 2. Arithmetic operators, relational and logical operators, increment and decrement operators and bitwise operators. [1Hour] 3. Type conversion, assignment operators and expression, conditional expressions, precedence and order of evaluation. [2 Hours]	**08 Hours**

4. Statements and blocks, IF-ELSE, ELSE-IF, SWITCH, LOOPS-WHILE, DO-WHILE and FOR, Break and continue statements. [4 Hours]	
Module – 3	
Arrays and Strings 1. 1-D arrays and strings, searching: Linear and binary searching. Comparison between search procedures. Programs on strings and string handling functions. [4 hours] 2. Sorting: Selection, bubble. Comparison between sorting procedures. Sorting with strings. [2 hours] 3. Multidimensional arrays and matrices [2 hours]	**08 Hours**
Module-4	
Modular programming and recursive functions 1. Functions: The prototype declarations. Actual and formal parameters, function definition [3 hours] 2. Function call: Pointer variables, Declaration and dereferencing pointer variables. Passing arguments to a function, by value, by reference. Functions with and without returns, Scope of variables, Recursive programming, as a different way of solving problems [6 hours]	**09 Hours**
Module-5	
More data types in C and others 1. Structures: Defining structures and Array of Structures [3 hours] 2. Pointers: Pointer arithmetic. Pointer to structures [2 hours] 3. Computer and cyber security [1 hour]	**06 Hours**

Course outcomes:

After studying this course, students will be able to:

- 1: Explain basics of computing, use problem solving techniques to solve simple problems using C language.
- 2: Use operators, decision making and looping constructs for solving complex programs.
- 3: Understand and use derived data structures like arrays and strings to solve higher level programs.
- 4: Understand and implement use of modular programming to decompose a problem into functions and synthesize a complete program.
- 5: Describe and use the derived data types like structures and pointers and understand the importance of cyber security.

Reference Books:

1. Dromey.R. G, *How to solve it by computers*, Pearson Education, 2007.
2. Brian W. Kernighan and Dennis M. Ritchie, *The C Programming language (2e)*, Pearson India, 2015.
3. Deital. P and Deitel. H. M, *C: How to program (9e)*, Pearson, 2022.
4. Balagurusamy.E, *Computing fundamentals and C programming (2e)*, MC GRAW HILL INDIA, 2017.

PROBLEM SOLVING USING COMPUTERS LAB [0 0 3 1]

[Revised Credit System]
(Effective from the academic year 2022-23)
FIRST YEAR (COMMON TO ALL BRANCHES)

Subject Code	**CSE1061**	**IA Marks**	**60**
Number of Practical Hours/Week	**03**	**Exam Marks**	**40**
Total Number of Practical Hours	**36**	**Exam Hours**	**02**

CREDITS – 01

Course objectives: This laboratory course enable students to

- Understand the basics of computing and various problem solving techniques
- Understand and use various programming concepts using C language
- Understand the concepts of modular programming and implement some mathematical applications
- Understand and implement Structure, Pointer and Matlab Programming

Descriptions

Implement all the experiments in C Language and MATLAB under Windows environment

L1- Introduction to computing and programming IDE
L2-Simple C programming
L3- Branching control structures
L4- Looping control structures
L5- 1D Array
L6- 2D Array
L7- Strings
L8- Modular programming & Recursive functions
L9- Pointers & Structures
L10 – MATLAB programming -1
L11 – MATLAB programming -2
L12 – MATLAB Simulink

Course outcomes:

On the completion of this laboratory course, the students will be able to:

- 1: Understand the basics of computing and operating systems, formulate simple algorithms for arithmetic and logical problems, translate the algorithms to programs, test and execute the programs and correct syntax and logical errors.
- 2: To use arrays and pointers to formulate algorithms and simple programs. Also apply programming to solve various matrix, searching, sorting problems. Decompose a problem into functions and synthesize a complete program using divide and conquer approach. Implement recursive programming as alternate method.
- 3: Apply the concept of structure and pointer programming and MATLAB.

Conduction of Practical Examination:

1. All laboratory experiments are to be included for practical examination.
2. Marks distribution will be both for write up and execution.
3. Change of experiment is not allowed during final lab examination.

Reference books:

1. Brian W. Kernighan and Dennis M. Ritchie, *The C Programming language (2e)*, Pearson Education, 2015.
2. Deital.P. J and Deitel.H.M, *C: How to program (7e)*, Pearson Education, 2010.
3. Balagurusamy.E, *Computing fundamentals and C programming (1e)*, MC GRAW HILL INDIA, 2017.
4. Delores Etter, Introduction *to MATLAB,* Pearson Education India, 2019.
5. Stormy Attaway, *Matlab: A practical Introduction to Programming and Problem Solving (4e)*, Butterworth-Heinemann, Elsevier, 2017.