SRI KRISHNA INSTITUTE OF TECHNOLOGY

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#29, Chimney Hills, Hesaraghatta Main Road, Chikkabanavara Post, Bangalore- 560090

Department of Computer Science and Engineering

Academic Year: 2021-2022	Semester: 2
Course Name: PROBLEM-SOLVING THROUGH PROGRAMMING	Course Code: 21PSP23/13
Total Contact hours: 50	Credits:3
SEE Marks: ; CIE: 50	Total Marks: 100
Course Plan Author: Mrs Sowmya C V	Date: 3/04/2022

Course Prerequisites: Basic knowledge on computer.

Course Objectives:

1. Elucidate the basic architecture and functionalities of a Computer
2. Apply programming constructs of C language to solve the real-world problems
3. Explore user-defined data structures like arrays, structures and pointers in implementing solutions to problems
4. Design and Develop Solutions to problems using modular programming constructs such as functions and procedures

Course Outcomes:

CO Number	Course Outcome At the end of the course, student should be able to . . .	Blooms' Level
CO1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts	L2
CO2	Apply programming constructs of C language to solve the real world problem	L3
CO3	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting	L2
CO4	Explore user-defined data structures like structures, unions and pointers in implementing solutions	L3
CO5	Design and Develop Solutions to problems using modular programming constructs using functions	L3

Program Outcomes and Program Specific Outcomes

PO, PSO	1.Engineering Knowledge; 2.Problem Analysis; 3.Design / Development of Solutions; 4.Conduct Investigations of Complex Problems; 5.Modern Tool Usage;

	6.The Engineer and Society; 7.Environment and Sustainability; 8.Ethics; 9.Individual and Teamwork; 10.Communication; 11.Project Management and Finance; 12.Life-long Learning; PSO1.:Accomplish The Skills To Design And Develop Computer Applications In Areas Related To Computer And Networking Systems, Artificial Intelligence , Data Processing And Iot Of Varying Complexity PSO2. Dexterity To Apply Modern Computing Languages And Platforms In Creating Career Paths To Be An Entrepreneur And Relish For Higher studies. PSO3: Ability To Use And Enhance Open Ended Programming Environment To Deliver A Quality Product.

CO – PO Mapping

Course Outcomes	Program Outcomes														
	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	2	3										2	
CO2	3	3	2	3		2		2						2	
CO3	3	3	3	2									2	2	
CO4	3	2	3	2		2		2					3	3	
CO5	3	1	3	1	2	2		2					3	3	

Course Content (Syllabus)

Module 1:
Introduction to Computer Hardware and Software: Computer generations, computer types, bits, bytes and words, CPU, Primary memory, Secondary memory, ports and connections, input devices, output devices, Computers in a network, Network hardware, Software basics, software types. Overview of C: Basic structure of C program, executing a C program. Constant, variable and data types, Operators and expressions

Module 2
Managing Input and output operations. Conditional Branching and Loops. Example programs, finding roots of a quadratic equation, computation of binomial coefficients, plotting of Pascal's triangle.

Module 3
Arrays: Arrays (1-D, 2-D), Character arrays and Strings, Basic Algorithms: Searching and Sorting Algorithms (Linear search, Binary search, Bubble sort and Selection sort).

Module 4
User Defined Functions and Recursion. Example programs: Finding Factorial of a positive integer, GCD of two numbers and Fibonacci sequence

Module 5
Structures, Unions and Pointers, Pre-processor Directives and Example Programs like Addition of two complex numbers using structures , compute the sum, mean and standard deviation of all elements stored in an array of N real numbers using pointers.

Schedule of Instruction

Sl.no	Class no	Module	Topic	Reference (Book, Page no.)	Course Outcome	Delivery mode
1	1	**Module1: 1**	Introduction to Computer	T2, 1-5	CO1	L
2	2		Hardware and Software: Computer generations, computer types	T2, 6-10	CO1	L
3	3		bits, bytes and words, CPU, Primary memory, Secondary memory	T2, 11-20	CO1	L/V
4	4		ports and connections, input devices	T2, 21-25	CO1	L/V
5	5		output devices,	T2, 26-27	CO1	L
6	6		Computers in a network	T2, 28-30	CO1	L
7	7		Network hardware, Software basics,	T2, 31-37	CO1	L
8	8		software types.	T2, 38-40	CO1	L

9	9		Overview of C: Basic structure of C program	T1, 1-10	CO1	L
10	10		variable and data types, Operators and expressions	T1, 22-72	CO1	L
11	11	**Module1: 2**	Managing Input and output operations	T1, 81-101	CO2	L/V
12	12		Conditional Branching	T1, 112-133	CO2	L
13	13		Loops	T1, 149-173	CO2	L
14	14		Example programs,	T1, 174	CO2	L
15	15		computation of binomial coefficients	T1, 175	CO2	L
16	16		finding roots of a quadratic equation	T1, 176	CO2	L
17	17		plotting of Pascal's triangle.	T1,177		
18	18	**Module 3:**	**Arrays (1-D, 2-D),**	T1, 189	CO2	L
19	19		Character arrays	T1, 243	CO2	L
20	20		Strings	T1,248	CO2	L
21	21		Basic Algorithms: Searching	T1, 249	CO3	L
22	22		Sorting Algorithms	T1, 250	CO3	L
23	23		Linear search	T1, 251	CO3	L/V
24	24		Binary search	T1, 252	CO3	L
25	25		Bubble sort	T1, 253	CO3	L
26	26		Selection sort	T1, 254	CO3	L
27	27					
28	28	**Module 4:**	User Defined Function	T1, 266	CO4	L
29	29		Recursion	T1, 291	CO4	L/V
30	30		Example programs: Finding Factorial of a positive integer	T1, 292	CO4	L
31	31		GCD of two numbers	T1, 293	CO4	L
32	32		Fibonacci sequence.	T1, 294	CO4	L
33	33		Extra Example programs	Web	CO4	L
34	34		Extra Example programs	Web	CO4	L
35	35		Extra Example programs	Web	CO4	L
36	36		Extra Example programs	Web	CO4	L
37	37	**Module 5:**	Structures, .	T1, 320	CO5	L
38	38		Unions and Pointer	T1, 338	CO5	L

39	39		Pre-processor Directives	T1, 269	CO5	L
40	40		Example Programs like Addition of two complex numbers using structures	T1, 447	CO5	L
41	41		compute the sum	T1, 461	CO5	L
42	42		mean and standard deviation of all elements stored in an array of N real numbers using pointers.	T1, 462	CO5	L

**L – Lecture, V- Videos or any other mode*

Textbooks	
T1	1. E. Balaguruswamy, Programming in ANSI C, 7th Edition, Tata McGraw-Hill
T2	Brian W. Kernighan and Dennis M. Ritchie, The 'C' Programming Language, Prentice Hall of India
T3	
T4	
Reference books	
R1	Reema Thereja , Programming in C , Cengage publication,
R2	
R3	
R4	

	Web links and Video Lectures (e-Resources):
1	Course Website Link prepared by Faculty (mandatory)
2	elearning.vtu.ac.in/econtent/courses/video/BS/15PCD23.html
3	https://nptel.ac.in/courses/106/105/106105171/
4	MOOC courses can be adopted for more clarity in understanding the topics and verities of problem solving methods
5	

Assessment Schedule:						
Sl.No.	**Assessment type**	**Contents**	**CO**	**Duration In Hours**	**Marks**	**Date & Time**
1	**CIE Test 1**	M1 and M2	CO 1, 2	1Hr 15Min	50	
2	**CIE Test 2**	M3 and M4	C0 3,4	1Hr 15Min	50	
	CIE Test 3	M4 nad M5	CO 4,5	1Hr 15Min	50	
3	**Assignment 1**	**M1 and M2**				
4	**Assignment 2**	**M3 and M4**				
5	**Seminar** ***(or any planned activtiy)***	**Seminar on M5**				
6	**Semester End Examination**					

Seminar: Group of 6-8 students
Module 1,2,3,4 & 5

CIE + SEE = 50 + 50 =100marks

Faculty Incharge DAC Chairman