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SARVAJANIK UNIVERSITY

SARVAJANIK COLLEGE OF ENGINEERING AND TECHNOLOGY

BACHELOR OF TECHNOLOGY

B.Tech	1	Semester	1/2	Teaching Scheme				Evaluation Scheme	
Subject Name	Programming for Problem Solving			**L**	**T**	**P**	**Credits**	**CCE**	**SEE**
Subject Code	BTCO22103			2	-	-	2	50	50
Type of course	Engineering Science Course			CCE : Continuous and Comprehensive Evaluation SEE : Semester End Evaluation					
Prerequisite	No prerequisite								
Rationale	To develop an understanding of C programming languages. Introduce and build the required skills for problem-solving through logical thinking. To achieve proficiency in necessary skills for problem solving using C programming language.								

Course Outcomes (COs): At the end of the course, students will be able to		**Marks % Weightage**
CO – 1	Outline algorithm, flowchart, and pseudocode for solving mathematical and logical problems.	10
CO – 2	Describe syntax, semantics, data types, conditional statements, and control structures in 'C' language.	35
CO – 3	Exemplify the concepts of array and strings for solving computational problems.	20
CO – 4	Demonstrate the basic concepts of procedural programming using functions, structures, and unions in writing efficient and maintainable programs.	30
CO - 5	Illustrate the concepts of pointers dealing with memory management and files for effective programming.	05

Course Contents

Unit	**Content**	**Tentative Teaching Hours**	**Tentative Unit % Weightage**
1	**Introduction to Programming and Problem Solving Concepts :** Programming languages - Machine level, Assembly level and High level languages, Problem solving using Algorithm and Flowchart, Introduction to ANSI C, Structure of C program, I/O library functions, Math library functions, How to write and compile a C program, How to run a C program, Sample Programs.	3	10
2	**Variables, constants, operators, and expressions :** Keywords, Identifiers, Data types - primary data types, user defined data types, sizes of data types, Variables - declaration of variables,	4	15

	initialization of variables, assigning values to variables, Constants - declaring constants, defining symbolic constants, expressions, evaluation of expressions, type conversion - implicit and explicit, precedence and associativity, Operators and their types - Arithmetic, Relational, Logical, Assignment, Increment and Decrement, Conditional (Ternary), Bitwise, Comma operator, sizeof operator.		
3	**Control structures - Branching and Looping :** Simple statements, decision-making (Branching) statements - Simple if statement, if-else-if statement, multiple if-else ladder, switch statement, nested if statement. Looping statements - for loop, while loop, do-while loop, nesting of loops, break and continue, goto statement.	6	20
4	**Arrays and Strings:** Introduction to arrays, declaration and initialization of 1D-array, 2D-array, and Multidimensional array, working with integer arrays, Character array (string) - declaration and initialization of strings, string built-in functions - strlen(), strcpy(), strcat(), strrev(), strcmp(), etc..	5	20
5	**Functions :** Introduction, Basics of function - function prototype, function definition, function declaration, function calls, Functions with no argument and no return value, Functions with arguments and no return value, Functions with no argument and return value, Functions with arguments and return value, Recursive functions, Passing arrays to functions, Call by value, Call by reference.	5	20
6	**Structures and Unions :** Basics of structure - definition, declaration, accessing structure members, structure initialization, structures and arrays, nested structures, structure and functions - Passing structure members to functions, Passing structure to functions, typedef, Introduction to union, Difference between structure and union.	3	10
7	**Pointers and File Management:** Basics of pointers - declaration and initialization, Pointer with user-defined function, Pointer and array, memory allocation and deallocation, Pointer and string, Introduction to File: opening and closing files, file opening modes ,basic file operations.	4	5

Suggested Specification table with Marks

% Distribution of Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
20	40	40	0	0	0

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **E:** Evaluate **C:** Create and above Levels **(Revised Bloom's Taxonomy)**

Recommended Reference Books

1 Balagarusamy E, Programming in ANSI C, Tata McGraw-Hill Publishing Company Limited, Eighth edition, 2019

2 Kanetkar Y. P., Let us C, BPB Publication , Fifteenth edition, 2016

3 B. Gottfried , Programming in C, Tata Mc-Graw Hill Publishers, Fourth edition, 2018

4 Kernighan B W and Ritchie D M, C Programming language, Prentice Hall , Second edition, 2015

5 Reema Thareja, Programming in C, Oxford University Press, Second Edition, 2012

6 K R Venugopal and Sudeep R Prasad, Mastering in C, Tata McGraw Hill, Second Edition, 2006

7 Samuel P. Harbison and Guy L. Steele, C: A Reference Manual, Pearson, Fifth Edition, 2002

CO-PO-Mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO – 1	2	1	3	1	2	1	-	-	-	-	1	1
CO – 2	2	-	3	1	1	-	-	-	-	-	1	1
CO – 3	2	2	3	1	2	-	-	-	-	-	1	1
CO – 4	2	2	2	1	2	-	-	-	-	-	1	1
CO – 5	2	1	2	1	2	-	-	-	-	-	-	1

List of Open Source/learning website/Other Details if any:

1. http://ps-iiith.vlabs.ac.in/
2. https://nptel.ac.in/courses/106104128
3. https://www.youtube.com/@problemsolvingthroughprogr8170