Faculty of Engineering and Technology

Bachelor of Technology (Semester II / First year)
In Effect from Academic Year 2026-27

Branch Name:	Computer Engineering / Information Technology / Artificial Intelligence and Data Science / Information and Communication Technology / Mechanical Engineering / Civil Engineering/ Electrical Engineering / Robotics & Automation
Program Code:	ET103 / ET105 / ET108/ET107 / ET101 / ET106 / ET109 / ET113
Course Title:	Problem Solving with Computational Thinking Practical
Course Code:	2ET1000107P
Pre-requisite Course:	This course is designed for anyone who is just beginning programming. No prior programming is needed.

Course Objectives:

1. Explain the approach of problem solving and provide a suitable solution for a given problem.
2. Apply Critical thinking in real world scenarios to provide solutions.
3. Apply Divergent Thinking and Convergent Thinking.
4. Understand decision support systems and are able to build decision trees.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
01	-	-	02	02	-	-	-	-	10	25	10	25	50

Course Contents:

Sr. No	Details	Contact Hours
1	a) Write a C program to find the sum and average of three numbers. b) Write a C program to find the sum of individual digits of a given positive integer. c) Write a C program to generate the first n terms of the Fibonacci sequence.	02
2	a) Write a C program to generate prime numbers between 1 to n. b) Write a C program to Check whether a given number is Armstrong Number or Not. c) Write a C program to evaluate algebraic expression (ax+b)/(ax-b).	02
3	a) Write a C program to check whether a given number is a perfect number or Not. b) Write a C program to check whether a given number is a strong number or not.	02
4	a) Write a C program to find the roots of a quadratic equation. b) Write a C program performing arithmetic operations using switch statements.	02
5	a) Write a C program to find the factorial of a given integer using a non-recursive function. b) Write a C program to find the factorial of a given integer using a recursive function.	02
6	a) Write a C program to find GCD of two integers by using a recursive function. b) Write a C program to find GCD of two integers using non-recursive functions.	02
7	a) Write a C program to find both the largest and smallest number in a list of integers. b) Write a C Program to Sort the Array in an Ascending Order. c) Write a C Program to find whether a given matrix is symmetric or not.	02
8	a) Write a C program to perform addition of two matrices. b) Write a C program that uses functions to perform Multiplication of Two Matrices.	02

9	a) Write a C program to use a function to insert a sub-string into a given main string from a given position. b) Write a C program that uses functions to delete n Characters from a given position in a given string.	02
10	a) Write a C program using user defined functions to determine whether the given string is palindrome or not. b) Write a C program that displays the position or index in the main string S where the sub string T begins, or - 1 if S doesn't contain T.	02
11	a) Write a C program to count the number of lines, words and characters in a given text. b) Write a C program to find the length of the string using Pointer.	02
12	a) Write a C program to Display array elements using calloc( ) function. Write a C Program to Calculate Total and Percentage marks of a student using structure.	02
13	a) Write a C program that uses functions and structures to perform the following operations: i) Reading a complex number ii) Writing a complex number iii) Addition of two complex numbers iv) Multiplication of two complex numbers b) Write a C program to display the contents of a file.	02
14	a) Write a C program to copy the contents of one file to another. b) Write a C program to merge two files into a third file. c) Write a C program to reverse the first n characters in a file.	02

Reference Books:

1. Programming in ANCI C, Seventh edition, by Balagarusamy E, Tata McGraw-Hill Publishing Company Limited
2. Programming with C, Second edition, by Gottfried, Tata McGraw-Hill Publishing Company Limited
3. Star C Programming, Pub: STAR Certification
4. C Programming language, Second edition, by Kernighan B W and Ritchie D M Prentice Hall,
5. Let us C, Fifth edition, by Kanetkar Y. P., BPB Publication
6. Fundamentals of Computing and Programming in C, First Edition, Oxford University Press, 2009 by Pradip Dey, Manas Ghosh,
7. "Computer programming", Pearson Education, 2007 by Ashok N. Kamthane.
8. "How to Solve it by Computer", Pearson Education, Fourth Reprint, 2007 by R.G. Dromey.
9. Programming in C, Reema Theraja, Oxford.

Course Learning Outcomes (CLO): At the end of the course, students will be able to

Course Outcome	Description	Bloom's Taxonomy Level
CLO 1	Formulate algorithm/flowchart for given arithmetic and logical problem	Understanding (2)
CLO 2	Translate algorithm/flowchart into C program using correct syntax and execute it	Applying (3)
CLO 3	Write programs using conditional, branching, iteration, and recursion	Applying (3)
CLO 4	Decompose a problem into function	Applying (3)
CLO 5	Develop an application using the concepts of array, pointer, structure, and file management to solve engineering and/or scientific problems	Applying (3)
CLO 6	Apply the different problem-solving techniques to provide solutions	Applying (3)

Mapping of CLO with PO and PSO:

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1	H	M	M		M											
CLO2	H	M			M							L				
CLO3	H	M	M		M											
CLO4	M	M	M		M							L				
CLO5	M	M										L				
CLO6	M	M										L				

H: High, M: Medium, L: Low