



Shrimathi Devkunvar Nanalal Bhatt Vaishnav College For Women (Autonomous)

Owned and Managed by Cork Industries Charities Trust
Affiliated to University of Madras - Re-Accredited with 'A+' Grade by NAAC - 4th Cycle

COURSE DATA SHEET

SEMESTER	I	BATCH	2026-2029
COURSE NAME	Computational Thinking and C Programming	COURSE CODE	26UCAGE1001
COURSE UNITS	5	COURSE TYPE	Generic Elective(GE) - I
CONTACT HOURS (L-T-P)	4-0-0	CREDITS	4
OFFERED BY	Department of Computer Applications	SHIFT (I / II) Shift I - 8:15 am - 12:50 pm Shift II - 1:00 pm - 5:30 pm	II

COURSE OBJECTIVES

1	To understand the various steps involved in program development.
2	To understand the basic concepts of the C programming language.
3	To develop modular, structured, and readable C programs.
4	To apply computational thinking and structured programming techniques to solve real-world problems using C.
5	To understand the various steps involved in program development.

COURSE OUTCOMES: On completion of the course the students will be able to...

	CO Statement	Cognitive Level
CO1	Demonstrate the basic knowledge of computer hardware and software.	K2
CO2	Formulate simple algorithms for arithmetic and logical problems.	K3



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CO3	Translate algorithms into C programs using structured programming concepts.	K3
CO4	Test, debug and execute C programs by correcting syntax and logical errors.	K4
CO5	Apply logical problem-solving skills to develop programs in C and other programming languages.	K5

SYLLABUS

UNIT	TOPICS	HOURS
1	Computer Systems, Hardware and Software, Computer Languages, Algorithms, Flowcharts, Algorithm Representation, Introduction to C, History, Features, Structure of C Program, Character Set, Tokens, Keywords, Identifiers, Constants, Variables, Data Types, Operators.	10
2	Selection Statements (if, if-else, switch), Iteration Statements (while, do-while, for), Jump Statements (break, continue, goto).	12
3	Functions, Modular Programming, User-defined Functions, Library Functions, Categories of Functions, Parameter Passing, Storage Classes, Recursion.	12
4	One-Dimensional Arrays, Two-Dimensional Arrays, Strings, String Input and Output Functions, String Manipulation Functions.	12
5	Pointers, Pointer Variables, Address Operator, Pointers with Arrays, Structures, Arrays of Structures, Unions.	14

TEXT/REFERENCE BOOKS/E - RESOURCES:

Text Books	1. E. Balagurusamy, Programming in ANSI C, 9th Edition, McGraw Hill Education, 2024. 2. Reema Thareja, Computer Fundamentals and Programming in C, Oxford University Press, Second Edition, 2016. 3. Paul Deitel and Harvey Deitel, C How to Program, 9th Edition, Pearson, 2022.
Books For Reference	1. ashavant Kanetkar, Let Us C, 18th Edition, BPB Publications, 2020. 2. Paul Deitel & Harvey Deitel, C: How to Program, 8th Edition, Pearson, 2016.



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	3. B.A. Forouzan and R.F. Gilberg, Computer Science: A Structured Programming Approach Using C , Third Edition, Cengage Learning.	
E-Learning Resources	1. https://www.geeksforgeeks.org/c/c-programming-language 2. https://www.tutorialspoint.com/cprogramming/index.htm 3. https://www.guru99.com/c-programming-tutorial.html 4. https://www.w3schools.in/c++-tutorial 5. https://www.programiz.com/c++-programming	

PEDAGOGY (TEACHING METHODOLOGY):

- Lecture Method
- Discussion Method
- Flipped Classroom
- Socratic Method
- Blended Learning
- Open Book test

CO-PO AND CO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	1	3	1	1
CO2	2	3	2	1	1	1	3	2	1
CO3	3	2	3	2	1	1	3	2	2
CO4	2	3	3	2	2	1	2	3	3
CO5	3	3	2	2	3	1	2	3	3
Average (Use only filled in cells for calculation)	2.6	2.6	2.2	1.6	1.6	1.0	2.6	2.2	2.0

Correlation Level: 1-Low 2-Moderate 3-Strong



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JUSTIFICATION OF CO-PO/PSO MAPPING			
CO	PO/PSO	Level of correlation	Justification
CO1	PO1	3	Develops strong domain knowledge of computer hardware, software, algorithms, and C programming fundamentals.
	PO2	2	Develops logical thinking and analytical skills through understanding computing concepts.
	PO3	1	Provides a basic understanding of computational methods to solve simple problems.
	PO4	1	Serves as a foundation for advanced programming and computer science courses.
	PO5	1	Introduces basic programming knowledge that supports lifelong learning.
	PO6	1	Promotes responsible and ethical use of computer systems and software.
	PSO1	3	Provides strong foundation in computational thinking and C programming concepts.
	PSO2	1	Introduces basic programming skills required for application development.
	PSO3	1	Creates awareness of programming fundamentals for higher studies and careers.
CO2	PO1	2	Applies programming knowledge to formulate algorithms for problem solving.
	PO2	3	Develops strong logical reasoning and analytical thinking through algorithm design.
	PO3	2	Designs algorithmic solutions for arithmetic and logical problems.
	PO4	1	Supports learning of advanced programming concepts.
	PO5	1	Enhances analytical skills useful for future employment.



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	PO6	1	Encourages systematic and disciplined problem-solving approaches.
	PSO1	3	Strengthens computational thinking and algorithm development skills.
	PSO2	2	Develops problem-solving skills using algorithms.
	PSO3	1	Provides introductory knowledge for software development.
CO3	PO1	3	Demonstrates strong knowledge in translating algorithms into structured C programs.
	PO2	2	Applies logical reasoning while implementing algorithms in C.
	PO3	3	Develops efficient software solutions using structured programming techniques.
	PO4	2	Supports advanced programming and software engineering courses.
	PO5	1	Improves programming competency for career development.
	PO6	1	Encourages disciplined coding practices and professional ethics.
	PSO1	3	Develops strong programming knowledge using C language.
	PSO2	2	Enhances coding and program development skills.
	PSO3	2	Prepares students for software development and higher education.
CO4	PO1	2	Applies programming knowledge to test and debug C programs.
	PO2	3	Develops analytical thinking by identifying and correcting program errors.
	PO3	3	Produces reliable software solutions through testing and debugging.
	PO4	2	Strengthens practical programming skills required for advanced courses.
	PO5	2	Improves employability through debugging and software testing skills.



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	PO6	1	Promotes ethical software development and responsible programming practices.
	PSO1	2	Enhances understanding of software development processes.
	PSO2	3	Develops strong debugging and testing skills.
	PSO3	3	Prepares students for professional software development practices.
CO5	PO1	3	Applies computational thinking and logical reasoning to solve programming problems effectively.
	PO2	3	Demonstrates strong analytical and problem-solving skills through programming.
	PO3	2	Develops practical software solutions using programming concepts.
	PO4	2	Supports progression to advanced programming and higher education.
	PO5	3	Builds programming expertise and lifelong learning skills for employment.
	PO6	1	Encourages ethical and responsible application of programming knowledge.
	PSO1	2	Strengthens domain knowledge in programming and software development.
	PSO2	3	Develops strong programming and computational problem-solving skills.
	PSO3	3	Equips students with the knowledge and skills required for employment and higher studies in computing.