

KUMARAGURU COLLEGE OF TECHNOLOGY,

An autonomous Institution affiliated to Anna University, Chennai

COIMBATORE – 641 049.

B.E. COMPUTER SCIENCE AND ENGINEERING

REGULATION 2024A



I Semester (2026 Batch)

Department of Computer Science and Engineering

A handwritten signature in black ink, appearing to be "Rm", is written over a light blue grid background.

Signature of BOS Chairman-CSE

VISION

To evolve as a center of excellence in Computer Science and Engineering to serve the changing global needs of industry and society.

MISSION

- **Industry Readiness:** Computer Science and Engineering department is committed to bring out career-oriented graduates who are industry ready through innovative practices of teaching-learning process.
- **Professional Development:** To cultivate professional competence, strong ethical values, team spirit, and leadership qualities among graduates by promoting research culture and continuous learning.
- **Nation Building:** To contribute towards techno-economic and social development of the nation through quality human resource and encouraging entrepreneurship among the young graduates.

PROGRAM SPECIFIC OUTCOMES (PSOs)

The Program Specific Outcomes of Computer Science and Engineering Undergraduate Program are:

PSO 1: Proficiency in Software Engineering and System Design

Graduates will be able to design, develop, and optimize software solutions, applying core principles of computer science to build efficient, scalable, and secure systems

PSO 2: Competency in Emerging Technologies

Graduates will develop expertise in emerging technologies and specialized domains enabling them to Innovate and build advanced solutions meeting Industrial and societal needs.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

The Program Educational Objectives of the Undergraduate programme in Computer Science and Engineering are to:

PEO I. Enable graduates to be successful in their chosen careers, by applying their continual learning of Computer Science and Engineering in their work and life situations.



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PEO II. Enable graduates of the program to continue to adopt latest technologies and be critical learners displaying creativity and demonstrate to be leaders.

PEO III. Prepare graduates of the program to be innovative product engineers catering to the requirements of the enterprises and society.

PROGRAM OUTCOMES (POs)

Graduates of the Computer Science and Engineering Undergraduate Program should have the ability to:

PO1: Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization to develop to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development.

PO3: Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required.

PO4: Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions.

PO5: Engineering Tool Usage: Create, select, and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems.

PO6: The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture, and environment.

PO7: Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws.

PO8: Individual and Collaborative Teamwork: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.



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PO9: Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences.

PO10: Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

PO11: Life-Long Learning: Recognize the need for and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change.



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COMPUTER SCIENCE AND ENGINEERING REGULATION 2024 B.E. Computer Science and Engineering - Curriculum 2026 Batch Structure									
Semester I									
S.No	Course code		Course Mode	Course Type	L	T	P	J	C
1	24HSI108	Essential English for Everyday Communication	Embedded	HS	1	0	2	0	2
	24HSI109	Professional Communication for Academic and Workplace	Embedded		1	0	2	0	
	24HSJ110	Project-Based English for Fluency and Impact	Project		0	0	0	4	
2	24MAI118	Linear Algebra and Calculus for Computing	Embedded	BS	3	0	2	0	4
3	24PHI108	Physics of Computing and Emerging Technologies	Embedded	BS	3	0	2	0	4
4	24CSI022	Programming in C	Embedded	ES	1	0	4	0	3
5	24CSI023	Digital Logic Circuits	Embedded	ES	3	0	2	0	4
6	24HST101	Heritage of Tamils	Theory	HS	1	0	0	0	1
7	24INP102	Innovation Practicum - 1	Practical	ES	0	0	2	0	1
8	24HSP111	Holistic Wellness - 1	Practical	HS	0	0	2	0	1
9	24INO101	FCLF- General Stack-1	Practical	OE	0	0	2	0	1
Total Credits									21
Total Contact Hours/week									30
Semester II									
S.No	Course code	Course Title	Course Mode	Course Type	L	T	P	J	C
1	24HSP011	Strategic Conversation Skills	Practical	HS	0	0	2	0	1
2	24MAI128	Multivariate Calculus and Statistical Forecasting	Embedded	BS	3	0	2	0	4
3	24CSI007	Python for Computational Problem Solving	Embedded	ES	1	0	4	0	3
4	24CSI024	Data Structures and Algorithms	Embedded	PC	2	0	4	0	4
5	24ITT203	Computer Organization and Architecture	Theory	PC	3	0	0	0	3
6	24HST102	Tamils and Technology	Theory	HS	1	0	0	0	1
7	24INP103	Innovation Practicum- 2	Practical	ES	0	0	2	0	1
8	24HSP112	Holistic Wellness-2	Practical	HS	0	0	2	0	1



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9	24INO102	FCLF- General Stack-2	Practical	OE	0	0	2	0	1
10	24CST028	Disruptive and Emerging Technologies	Theory	HS	1	0	0	0	1
Total Credits									20
Total Contact Hours/week									29
Semester III									
S.No	Course code	Course Title	Course Mode	Course Type	L	T	P	J	C
1	24MAI234	Computational Probability and Statistics	Embedded	BS	3	0	2	0	4
2	24HSP012	Developing Collaborative Discussion and Presentation Skills	Practical	HS	0	0	2	0	1
3	24CSI025	Object Oriented Programming	Embedded	ES	1	0	4	0	3
4	24CSI030	Foundations of Web Development and UI/UX	Embedded	ES	1	0	4	0	3
5	24CSI014	Design and Analysis of Algorithms	Embedded	PC	3	0	2	0	4
6	24CSI009	Database Management Systems	Embedded	PC	3	0	2	0	4
7	24ITI005	Operating Systems	Embedded	PC	3	0	2	0	4
8	24INP201	Innovation Practicum- 3	Practical	ES	0	0	2	0	1
9	24INOXYY	FCLF- General Stack-3	Practical	OE	0	0	2	0	1
10	24INM201	Universal Human Values-II	Theory	HS	1	0	0	0	1
Total Credits									26
Total Contact Hours/week									32
Semester IV									
S.No	Course code	Course Title	Course Mode	Course Type	L	T	P	J	C
1	24MAT243	Discrete Mathematics and Optimization	Theory	BS	3	0	0	0	3
2	24HSP013	Mastering Career Readiness	Practical	HS	0	0	2	0	1
3	24CSI026	Full Stack Web Development	Embedded	PC	2	0	4	0	4
4	24CSI011	Computer Networks and Security	Embedded	PC	3	0	2	0	4
5	24-----	Artificial Intelligence and Machine Learning	Embedded	PC	3	0	2	0	4
6	24CSI015	Software Engineering and Agile Practices	Embedded	PC	3	0	0	2	4
7	24INM202	Environmental Science and Sustainability	Embedded	HS	1	0	2	0	2
8	24INP202	Innovation Practicum - 4	Practical	ES	0	0	2	0	1
Total Credits									23
Total Contact Hours/week									29



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Semester V										
S.No	Course code	Course Title	Course Mode	Course Type	L	T	P	J	C	
1	24CST016	Formal Languages and Compiler Design	Theory	PC	3	1	0	0	4	
	24-----	Cloud and DevOps	Embedded	PC	3	0	0	2	4	
3	24CSI017	Big Data Analytics	Embedded	PC	3	0	2	0	4	
4	24HSPXY	Indian/Foreign Language	Theory	HS	0	0	4	0	2	
5	24-----	Professional Elective I	Embedded/ Theory	PE	2	0	2	0	3	
6	24-----	Professional Elective II	Embedded/ Theory	PE	2	0	2	0	3	
7	24INM002	Disaster Management and Preparedness	Theory	HS	2	0	0	0	0	
8	24-----	OE2	Theory	OE	3	0	0	0	3	
Total Credits										23
Total Contact Hours/week										31
Semester VI										
S.No	Course code	Course Title	Course Mode	Course Type	L	T	P	J	C	
1	24CST031	Foundations of Blockchain Technology	Theory	PC	3	0	0	0	3	
2	24-----	Generative AI Application Development and Agentic AI	Embedded	PC	3	0	2	0	4	
3	24-----	Professional Elective III	Embedded/ Theory	PE	2	0	2	0	3	
4	24-----	Professional Elective IV	Embedded/ Theory	PE	2	0	2	0	3	
5	24-----	Professional Elective V	Embedded/ Theory	PE	2	0	2	0	3	
6	24-----	Professional Elective VI	Embedded/ Theory	PE	2	0	2	0	3	
7	24-----	OE3	Theory	OE	3	0	0	0	3	
8	24INM302	Constitution of India	Theory	HS	1	0	0	0	0	
Total Credits										22
Total Contact Hours/week										28
Semester VII										
S.No	Course code	Course Title	Course Mode	Course Type	L	T	P	J	C	
1	24-----	Professional Elective VII	Theory	PE	2	0	2	0	3	
2	24-----	Professional Elective VIII	Theory	PE	0	0	6	0	3	
3	24-----	OE4	Theory	OE	3	0	0	0	3	



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4	24INM102	Indian Knowledge System in Science and Engineering	Theory	HS	1	0	0	0	1
5	24CSJ419	Project Phase-I	Project	PRJ	0	0	0	6	3
6	24CSJ427	Professional Internship/Certification	Project	PRJ	0	0	0	6	3
Total Credits									16
Total Contact Hours/week									20
Semester VIII									
S.No	Course code	Course Title	Course Mode	Course Type	L	T	P	J	C
1	24CSJ421	Project Phase-II	Project	PRJ	0	0	0	24	12
Total Credits									12
Total Contact Hours/week									24
Grand Total Credits									163



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SEMESTER I



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24CSI022	PROGRAMMING IN C	L	T	P	J	C
		1	0	4	0	3
ES		SDG		9		

Pre-requisite courses	Nil	Data Book / Codes / Standards (If any)	Nil
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Course Objectives:	The purpose of taking this course is to:
1	Gain proficiency in logical reasoning and problem-solving using algorithms and flowcharts.
2	Acquire knowledge of fundamental programming constructs in C, including data types, variables, control structures, and input/output operations.
3	Attain the capability to address real-world problems by utilizing arrays, strings, and modular programming with functions.
4	Introduce concepts of pointers, storage classes, and structures as tools for effective data representation and management.
5	Provide hands-on experience in building C-based applications that incorporate file operations, debugging strategies, and best coding practices.

Course Outcomes:	After successful completion of this course, the students shall be able to	Bloom's Taxonomy Level (BTL)
CO 1	Illustrate the algorithmic problem-solving techniques using flowcharts and pseudocode.	U
CO 2	Solve computational problems by applying decision-making constructs and iterative controls using basic C programming.	Ap
CO 3	Apply arrays, strings, and functions to solve programming challenges using modular programming.	Ap
CO 4	Utilize pointers, storage classes, and structures for efficient data manipulation and memory management, incorporating file operations in problem-solving scenarios.	Ap
CO 5	Apply debugging techniques and tools to identify, trace, and correct syntax, logical, and runtime errors in C programs.	Ap

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11		
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning	PSO-1	PSO-2



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Dynamic memory allocation- Structures and Unions: Defining a Structure - Processing a Structure - User defined data types (Typedef) -Unions Practical Component Using Pointers - operations and arithmetic, swapping values using pointers, array manipulation- searching. Dynamic memory allocation using malloc, calloc, and free, Programs using structures and unions, Accessing structure members using pointers	12 Hours
FILES AND DEBUGGING File Operations -Open,close, read,write- Processing a data file -Unformatted data files - Concept of binary files - Accessing a file randomly using fseek- Types of errors: Syntax, Logical, Runtime – Debugging techniques: Tracing with printf(), setting breakpoints, step-by-step execution – Introduction to debugging tools: gcc -g, GDB- Integrated Development Environment – Best practices in debugging C programs. Practical Component Text and Binary File read/write operations with Structures and Union – Search and Replace using fseek, Debugging C programs using printf() tracing and GDB, Identifying and fixing errors- integer division, incorrect loop condition, reading a non-existing file, Divide by zero, Accessing array out of bounds.	3 Hours 12 Hours

Theory 15 Hours:	Tutorial Hours:	Practical 60 Hours:	Project Hours:	Total 75 Hours:
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Learning Resources
Textbooks
1. Yashavant Kanetkar, Let Us C – Authentic Guide to C Programming Language, 20th Edition, BPB Publications, 2024. 2. Byron S Gottfried and Jitendar Kumar Chhabra, “Programming with C”, Tata McGraw Hill Publishing Company, Third Edition, New Delhi, 2018. 3. E. Balagurusamy, Programming in ANSI C, 8th Edition, McGraw-Hill Education, 2019.
Reference books/ Web Links
1. R. G. Dromey, How to Solve It by Computer, Pearson Education, First Edition, New Delhi, 2008. 2. Pradip Dey and Manas Ghosh, Programming in C, 2nd Edition, Oxford University Press, 2011. 3. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, 2nd Edition, Pearson Education, 2006. 4. Ashok N. Kamthane, Computer Programming, Pearson Education, 2018. 5. Reema Thareja, Programming in C, 2nd Edition, Oxford University Press, 2011.
Online Resources
1. https://www.geeksforgeeks.org/c-programming-language/ 2. https://www.w3schools.com/c/ 3. https://www.programiz.com/c-programming 4. https://www.coursera.org/learn/c-for-everyone 5. https://www.codingninjas.com/studio/library/c-programming 6. https://www.w3schools.com/c/c_debugging.php 7. https://www.onlinegdb.com/



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Assessment (Embedded course)
MCQ, Experimental Cycle tests and End Semester Examination (Lab)

Course Curated by			
Expert(s) from Industry	Expert(s) from Higher Education Institution	Internal Expert	
-	-	Ms. R. Nivetha Department of Computer Science and Engineering	
Recommended by BoS on	06.06.2026		
Academic Council Approval	No: 30	Date	19.06.2026



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24CSI023	DIGITAL LOGIC CIRUCITS	L	T	P	J	C
		3	0	2	0	4
ES		SDG		9		

Pre-requisite courses	Nil	Data Book / Codes / Standards (If any)	
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Course Objectives:		The purpose of taking this course is to:
1	Provide a strong foundation in digital systems, number systems, binary codes, and Boolean algebra.	
2	Develop the ability to represent and simplify Boolean functions using Karnaugh map techniques and universal gates.	
3	Enable students to analyze and design combinational logic circuits for arithmetic and data processing applications.	
4	Equip students with the knowledge of sequential logic circuits, including flip-flops, counters, and registers.	
5	Introduce digital logic families, programmable logic devices, and hardware description languages for digital system implementation.	

Course Outcomes:		After successful completion of this course, the students shall be able to	Bloom's Taxonomy Level (BTL)
CO 1	Apply the concepts of digital systems, number systems, binary codes, and Boolean algebra to solve problems in digital logic representation.		Ap
CO 2	Apply Boolean function representation and minimization techniques to obtain optimized logic expressions for digital circuit implementation.		Ap
CO 3	Design combinational logic circuits for arithmetic and data processing applications based on given specifications.		Ap
CO 4	Demonstrate sequential logic circuit concepts including flip-flops, counters, and registers in digital system operations.		Ap
CO 5	Illustrate digital system realization using logic families, programmable logic devices, and basic VHDL modeling techniques.		Ap



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	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11		
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team	Communication	Project Management and Finance	Life-Long Learning	PSO-1	PSO-2
1	3												
2	3	3											
3	3	2	3									3	
4	3	2										3	
5	3		3										

Course Content	
DIGITAL SYSTEMS AND BOOLEAN ALGEBRA Introduction to Digital Systems, Analog and Digital Signals, Number Systems, Number Base Conversions, Complements-Signed Binary Numbers, Binary Codes, Boolean Algebra and its Properties, Boolean Functions, Simplification of Boolean Functions using Boolean Algebra. Practical Component: - Study of logic gates. - Verify Boolean algebra properties such as commutative, associative, distributive, and De Morgan's theorems using logic gates and truth tables.	9 Hours 4 Hours
BOOLEAN FUNCTION REPRESENTATION AND MINIMIZATION Canonical Forms-Standard Forms of Boolean Function-Karnaugh Maps (2, 3 and 4 Variables), Don't care condition-Simplification of Boolean Functions using K-Maps, Universal Gates, Realization of Logic Gates using NAND and NOR Gates. Practical Component: - Implement Boolean functions using logic gates and validate the outputs with truth tables. - Design logic circuits for simple real-world problem statements by deriving Boolean expressions, simplifying them using Karnaugh maps, and verifying the outputs.	9 Hours 4 Hours
COMBINATIONAL LOGIC CIRCUITS Combinational Circuit-Analysis of Combinational Logic Circuits, Design of Combinational Logic Circuits.Half Adder, Full Adder,Half Subtractor, Full Subtractor-Magnitude Comparator,Code Converters, Decoders, Encoders, Multiplexers, Demultiplexers-Parity checker and Generator-Applications of Combinational Logic Circuits. Practical Component: Design and construct half adders, full adders, half subtractors, and full subtractors.	9 Hours 12 Hours



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2. Develop a code converter circuit using logic gates. 3. Design and implement decoder and encoder circuits. 4. Construct multiplexers and demultiplexers and incorporate them into circuit designs. 5. Design and implement a circuit for a parity generator and parity checker using logic gates.	
SEQUENTIAL LOGIC CIRCUITS Introduction to Sequential Logic Circuits, Latches and Flip-Flops, SR Flip-Flop, JK Flip-Flop, D Flip-Flop, T Flip-Flop, Edge Triggering and Level Triggering, Flip-Flop Conversions, Asynchronous Counters, Synchronous Counters, Decade Counter, Ring Counter, Registers, Shift Registers (SISO, SIPO, PISO, PIPO), Applications of Sequential Logic Circuits.	9 Hours
Practical Component: 1. Implement and test various types of shift registers. 2. Design and build a synchronous and asynchronous counter.	6 Hours
LOGIC FAMILIES AND PROGRAMMABLE DEVICES Digital Logic Families, RTL, DTL, TTL, ECL and CMOS Logic Families, Characteristics and Comparison of Logic Families, Programmable Logic Devices, Programmable Logic Array (PLA), Programmable Array Logic (PAL), Complex Programmable Logic Devices (CPLD), Field Programmable Gate Arrays (FPGA), Implementation of Combinational Logic Circuits using PLA and PAL, Introduction to Hardware Description Languages, Basics of VHDL Modeling and Simulation for Arithmetic Circuits.	9 Hours
Practical Component: 1. Implement and simulate arithmetic circuits using VHDL models.	4 Hours

Theory Hours:45	Tutorial Hours:	Practical Hours:30	Project Hours:	Total Hours:75
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Learning Resources*
Textbooks
1. M. Morris R. Mano, Michael D. Ciletti, "Digital Design: With an Introduction to the Verilog HDL, VHDL, and System Verilog", 6th Edition, Pearson, 2018.
Reference Books
1. C. H. Roth Jr., Larry L. Kinney "Fundamentals of Logic Design", 8th Edition, Cengage Learning, 2018.
2. John F. Wakerly, "Digital Design: Principles and Practices", 5th Edition, Pearson, 2018.
Online Resources
1. https://www.coursera.org/learn/digital-systems
2. https://nptel.ac.in/courses/108105113
Weblinks:
1. https://www.nesoacademy.org/ee/05-digital-electronics

Assessment (Embedded course)



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SA-I, SA-II, Activity and Learning Task(s), Mini project, MCQ, End Semester Examination (ESE) Lab Workbook, Experimental Cycle tests, viva-voce

Course Curated By			
Expert(s) from Industry	Expert(s) from Higher Education Institutions	Internal Expert(s)	
		Ms.P.Anitha Assistant Professor Dept of CSE	
Recommended by BoS on	06.06.2026		
Academic Council Approval	No: 30	Date	19.06.2026



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