



A CMI INSTITUTION

CHRIST COLLEGE OF ENGINEERING (AUTONOMOUS)

COMPUTER SCIENCE AND ENGINEERING

CURRICULUM AND SYLLABUS

2025 REGULATION



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Approved by BoS meeting held on:

Approved by Academic Council meeting held on:

BoS Chairperson

Dr Sooraj T R

Director of Academics

Dr. Manoj George

Principal

Dr. Soloman P A

(College seal)

2025 Curriculum - Programme Structure

Semester (Credits)	S1	S2	S3	S4	S5	S6	S7	S8	Total	%	KT U	AICTE model
Humanities and Social Science Course including Management Course (HM)	1	1	3	3	3	2	-	-	13	7.78	5.98	7.5
Basic Science Course (BS)	7	7	3	3	-	-	-	-	20	11.97	11.98	18.1
Engineering Science Course (ES)	12	11	-	-	1	-	-	-	24	14.37	16.16	16.87
Programme Core Courses (PC)	-	4	15	15	15	18	-	-	67	40.12	40.71	36.25
Programme Elective Course (PE)	-	-	-	3	3	3	6	3	18	10.78	10.78	5.6
Open Elective Course (OE)	-	-	-	-	-	3	3	3	9	5.38	5.39	5.6
Skill Enhancement Course (SE)	-	2	1	1	1	1	-	-	6	4.19	0	0
Project/ Internship/Seminar (PR/IP/SR)	-	-	-	-	-	-	6	4	10	5.99	5.99	10
Mandatory Course (MC) (Environmental Science, Induction program, Indian Constitution, Essence of Indian Knowledge Tradition)	0	0	0	0	0	0	0	0	0	0	0	0
Total	20	25	22	25	23	27	15	10	167			0
Minor	0	0	4	4	4	4	0	0	16			
Honour	0	0	0	4	4	4	4	0	16			

Additional 3 Credits from Activity points

Course Distribution by Semester and Type

Sl. No.	Course Type	Number of Courses								Total
		S1	S2	S3	S4	S5	S6	S7	S8	
1	Humanities and Social Science Course including Management Course (HM)	1	1	2	2	1	1	-	-	8
2	Basic Science Course (BS)	2	2	2	1	-	-	-	-	7
3	Engineering Science Course (ES)	4	4	1	-	1	-	-	-	9
4	Programme Core Courses (PC)	-	1	4	5	5	6	-	-	21
5	Programme Elective Course (PE)	-	-	-	1	1	1	2	1	6
6	Open Elective Course (OE)	-	-	-	-	-	1	1	1	3
7	Skill Enhancement Course (SE)	-	1	1	1	1	1	-	-	5
8	Project/ Internship/Seminar (PR/IP/SR)	-	-	-	-	-	-	2	1	3
9	Mandatory Course (MC)	-	-	-	2	1	-	-	-	3
	Total	7	9	10	12	10	9	5	3	65

Course Code Format Guidelines

Each course in the curriculum shall be identified by a unique nine-character alphanumeric code structured as follows:

1. First Letter - Department Code

Indicates the parent department:

- C - Civil Engineering
- M - Mechanical Engineering
- E - Electrical and Electronics Engineering
- L - Electronics and Communication Engineering
- V - VLSI
- R - Computer Science and Engineering
- B - Computer Science and Business Systems
- D - Computer Science and Engineering (Data Science)

2. Second and Third Letters - Curriculum Scheme Year

Represents the year in which the curriculum scheme was introduced (e.g., 25 for 2025).

3. Fourth and Fifth Letters - Abbreviation of Course Title

Two-letter short form of the course title (e.g., MA for Mathematics, DS for Data Structures).

4. Sixth Letter - Course Type Indicator

Denotes the nature of the course:

- T - Theory
- P - Practical
- E - Lab Embedded
- R - Project

5. Seventh Character - Semester Number

Indicates the semester in which the course is offered (e.g., 1 for Semester I).

6. Eighth and Ninth Characters - Course Sequence Number

Represents the order of the course in that semester (e.g., 21 for the 21st course).

Example:

M25TDT403

M - Mechanical Engineering

25 - Curriculum Revision 2025

TD - Thermodynamics

T - Theory Based Course

4 - Offered in Semester IV

03 – 3rd Course in that semester

FIRST SEMESTER: Computer Science and Engineering														
10 Days Compulsory Induction Program and Universal Human Values														
Sl. No:	Slot	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit				SS	Total		Credits	Hrs./Week
						L	T	P	R		CAE	ESE		
THEORY														
1	A	G25MAT101	BS	GC	Mathematics for Information Science-	3	0	0	0	4.5	40	60	3	3
2	B S1/ S2	G25PYE102	BS	GC	Physics for Information Science	3	0	2	0	5.5	40	60	4	5
		G25CYE103			Chemistry for Information Science									
3	C	G25EGE204	ES	GC	Engineering Graphics and Computer Aided Drawing.	2	0	2	0	4	40	60	3	4
4	D	G25EET105	ES	GC	Introduction to Electrical & Electronics Engineering (Part 1Electrical Engineering)	2	0	0	0	3	20	30	2+2 = 4	4
					(Part 2: Electronics Engineering)	2	0	0	0		20	30		
PRACTICALS														
5	F	A25ATE106	ES	CC	Algorithmic Thinking with Python	3	0	2	0	5.5	40	60	4	5
6	L	G25EEP107	ES	GC	Basic Electrical and Electronics Engineering Workshop	0	0	2	0	1	40	60	1	2
7	I S1/ S2	A25HWE108	HM	CC	Health and Wellness	1	0	1	0	0	40	0	1	2/3
		A25LSE109			Life Skills and Professional Communication	2	0	1	0	3.5	100	0		
MANDATORY COURSES														
8	-	-	MC	MC	Activity Point Programme ^s								0	-
Total										27.5			20	24/ 25

- L-T-P-R = Lecture – Tutorial – Practical - Project
- SS (Self Study) Hours = $1.5 \times L + 0.5 \times T + 0.5 \times P + R$
- CAE = Continuous Assessment and Evaluation, and ESE = End Semester Examination

^s **Activity Points:** Students are required to acquire a minimum of 120 activity points, with at least 40 points per group, to fulfil the curriculum requirement of 3 activity credits. At the end of 6th semester, the students are required to earn the minimum number of activity points from the AICTE mandated activity point programme to qualify for the award of B. Tech degree.

SECOND SEMESTER: Computer Science and Engineering														
Sl. No:	Slot	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit				SS	Total		Credits	Hrs./Week
						L	T	P	R		CAE	ESE		
THEORY														
1	A	G25MAT221	BS	GC	Mathematics for Information Science-2	3	0	0	0	4.5	40	60	3	3
2	B S1/ S2	G25PYE102	BS	GC	Physics for Information Science	3	0	2	0	5.5	40	60	4	5
		G25CYE103			Chemistry for Information and Electrical									
3	C	G25PCE206	ES	GC	Programming in C	2	0	2	0	4	40	60	4	4
4	D	G25FCT205	ES	GC	Foundations of Computing: From Hardware Essentials to Web Design	3	0	0	0	4.5	40	60	3	3
5	E	X25DMT207	PC	PC	Discrete Mathematics	3	1	0	0	5	40	60	4	4
6	F	A25IPT207	ES	CC	Engineering Entrepreneurship & IPR	3	0	0	0	4.5	40	60	3	3
PRACTICALS														
7	I* S1/ S2	A25HWE108	HM	CC	Health and wellness	1	0	1	0	0	40	0	1	2/3
		A25LSE109			Life Skills and Professional Communication	2	0	1	0	3.5	100	0		
8	L	G25ITP210	ES	CC	IT Workshop	0	0	2	0	1	40	60	1	2
MANDATORY COURSES														
9	M	A25ILE211	SE	CC	Introduction to Idea Lab and Digital Twin Technology	1	0	2	0	2.5	40	60	2	3
10	-	-	MC	MC	Activity Point Programme \$								-	-
Total										34/ 36.5			25	27/30

THIRD SEMESTER: Computer Science and Engineering															
Sl. No:	Slot	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit				SS	Total		Credits	Hrs./Week	
						L	T	P	R		CAE	ESE			
THEORY															
1	A	G25PRT311	BS	GC	Probability Distributions and Random Processes	2	1	0	0	3.5	40	60	3	3	
2	B	R25DER302	PC-PBL	PC	Digital Electronics #	2	1	0	1	4.5	60	40	4	4	
3	C	R25OPT303	PC	PC	Object Oriented Programming	2	1	0	0	3.5	40	60	3	3	
4	D	R25DST304	PC	PC	Data Structures and Algorithms	3	1	0	0	5	40	60	4	4	
5	F	A25SCT306	HM	CC	Strategic Communication and Documentation in Engineering Practice	2	0	0	0	3	50	-	2	2	
6	G	G25EST307	HM	CC	Environmental Science	1	0	0	0	1.5	40	60	1	1	
PRACTICALS															
7	H	R25DSP308	PC	PC	Data Structures Lab	0	0	3	0	1.5	50	50	2	3	
8	I	A25EDR329	SE	CC	Engineering Design and Innovation Studio (EDIS-I)	0	0	0	2	2	50	-	1	2	
9	J	R25OPP310	PC	PC	Object Oriented Programming Lab	0	0	3	0	1.5	50	50	2	3	
MANDATORY NON-CREDIT COURSES															
10	K	A25UHP311	MC	CC	Universal Human Values and Professional Ethics	1	0	1	0	2	50	50	Pass/Fail	2	
ACTIVITY POINT PROGRAMME															
11		A25APP311	MC	CC	Activity Point Programme					0			-		
VALUE ADDED COURSES															
12	R/M	-	VA	CC	Remedial/Minor course	3	1	0	0	5	40	60	4	4	
Total										28/33*			22/26*	27/31*	

* Project-Based Learning (PBL) Courses Integrated in Semesters 3 to 6

FOURTH SEMESTER: Computer Science and Engineering														
Sl. No:	Slot	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit Structure				SS	Total Marks		Credits	Hrs./Week
						L	T	P	R		CAE	ESE		
THEORY														
1	A	G26GTT401	BS	GC	Graph Theory	2	1	0	0	3.5	40	60	3	3
2	B	R25OST402	PC	PC	Operating Systems	2	1	0	0	3.5	40	60	3	3
3	C	R25DBT403	PC	PC	Database Management Systems	3	1	0	0	5	40	60	4	4
4	D	R25COR404	PC-PBL	PC	Computer Organization and Architecture	2	1	0	1	4.5	60	40	4	4
5	E	A25ECT305	HM	CC	Engineering Economics	2	0	0	0	3	40	60	2	2
5	F	R25PE14XX	PE	PE	Professional Elective – 1	3	0	0	0	4.5	40	60	3	3
6	G	G25CIT406	HM	CC	Indian Constitution	1	0	0	0	1.5	50	-	1	1
PRACTICALS														
8	G	R25OSP407	PC	PC	Operating Systems Lab	0	0	3	0	1.5	50	50	2	3
9	H	R25DBP408	PC	PC	Database Management Systems Lab	0	0	3	0	1.5	50	50	2	3
10	I	A25EDR429	SE	CC	Engineering Design and Innovation Studio (EDIS-II)	0	0	0	2	2	50	-	1	2
MANDATORY NON- CREDIT COURSES														
11	K	A25BCT410	MC	CC	Business and Managerial Communications	1	0	0	0	1.5	50	-	Pass / Fail	1
ACTIVITY POINT PROGRAMME														
12		A25APP412	MC	CC	Activity Point Programme					0			-	
VALUE ADDED COURSES														
13	M	-	VA	CC	Remedial/Minor/Honours Course	3	1	0	0	5	40	60	4	4
Total										32/37*			25/29*	29/33*

FIFTH SEMESTER: Computer Science and Engineering														
Sl. No:	Slot	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit				SS	Total		Credits	Hrs./Week
						L	T	P	R		CAE	ESE		
THEORY														
1	A	R25TCT501	PC	PC	Theory of Computation	3	0	0	0	4.5	40	60	3	3
2	B	R25CNR502	PC-PBL	PC	Computer Networks	2	1	0	1	4.5	60	40	4	4
3	C	R25MLT503	PC	PC	Machine Learning	3	1	0	0	5	40	60	4	4
4	D	M25MGT504	HM	CC	Management for Engineers	3	0	0	0	4.5	40	60	3	3
5	E	R25PE25XX	PE	PE	Professional Elective – II	3	0	0	0	4.5	40	60	3	3
6	F	A25INT506	ES	CC	Introduction to Industry 4.0	1	0	0	0	1.5	40	60	1	1
PRACTICALS														
7	G	R25ITP507	PC	PC	IoT and Embedded Systems Lab	0	0	3	0	1.5	50	50	2	3
8	H	R25MLP508	PC	PC	Machine Learning Lab	0	0	3	0	1.5	50	50	2	3
9	I	A25EDR529	SE	CC	Engineering Design and Innovation Studio (EDIS-III)	0	0	0	2	2	50	-	1	2
MANDATORY NON- CREDIT COURSES														
10	J	A25QRT510	SE	CC	Quantitative and Reasoning Skills	1	0	0	0	1.5	50	-	Pass/Fail	1
ACTIVITY POINT PROGRAMME														
11	-	A25APP511	MC	CC	Activity Point Programme								-	-
VALUE ADDED COURSES														
12	M/H	-	VA	CC	Remedial/Minor/Honours Course	3	1	0	0	5	40	60	4	4
	S5/S6	Industrial Visit (Maximum 12 Days are permitted, not exceeding 6 working days)												
Total										31/36*			27/31*	27/31*

Students can undertake the summer internship during the vacation after the 4th and 6th semester. The internship should be carried out in reputed industries, companies, or R&D organizations. The evaluation of the internship will consist of a presentation, report, and viva-voce. The credits will be added to the 5th and 7th semesters. Students can also opt for prescribed MOOC Courses instead of summer internship.

SIXTH SEMESTER: Computer Science and Engineering														
Sl. No:	Slot	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit				SS	Total		Credits	Hrs./Week
						L	T	P	R		CAE	ESE		
THEORY														
1	A	R25CDT601	PC	PC	Compiler Design	3	1	0	0	5	40	60	4	4
2	B	R25AAT602	PC	PC	Algorithm Analysis and Design	2	1	0	0	3.5	40	60	3	3
3	C	R25IQT603	PC	PC	Introduction to Quantum Computing	2	1	0	0	3.5	40	60	3	3
4	D	R25FDR604	PC-PBL	PC	Fundamentals of Digital Image Processing	2	1	0	1	4.5	60	40	4	4
5	E	R25PE36XX	PE	PE	Professional Elective – III*	3	0	0	0	4.5	40	60	3	3
6	C	R25OE16XX	OE	OE	Open Elective – I [#]	3	0	0	0	4.5	40	60	3	3
7	G	A25FLT607	HM	CC	Foreign Language Elective #	2	0	0	0	3	50	-	2	2
PRACTICALS														
8	G	R25CDP608	PC	PC	Compiler Lab	0	0	3	0	1.5	50	50	2	3
9	I	A25EDR629	SE	CC	Engineering Design and Innovation Studio (EDIS-IV)	0	0	0	2	2	50	-	1	2
10	H	R25DAP610	PC	PC	Data Analytics Lab	0	0	3	0	1.5	50	50	2	3
ACTIVITY POINT PROGRAMME														
11	-	A25APP611	MC	CC	Activity Point Programme \$									
VALUE ADDED COURSES														
12	M	-	VA	CC	Remedial/Minor/Honours Course	3	1	0	0	5	40	60	4	4
		Industrial Visit (Maximum 12 Days are permitted, not exceeding 6 working days)												
Total										33.5/ 38.5*			27/ 31*	30/ 34*

* Students are encouraged to choose professional electives from a single stream, preferably.

Open Electives are such courses which will be offered for other departments. Like ME department students have to opt open electives from CE/EEE/CS/CSDS/CSBS/ECE/VLSI/ME/EEE departments.

SEVENTH SEMESTER: Computer Science and Engineering														
Sl. No:	Slot	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit				SS	Total		Credits	Hrs./Week
						L	T	P	R		CAE	ESE		
THEORY														
1	A	R25PE47XX	PE	PE	Professional Elective - IV (Internship Students: Self Study/MOOC Approved by the College/Online Classes)	3	0	0	0	4.5	40	60	3	3
2	B	R25PE57XX	PE	PE	Professional Elective - V (Internship Students: Self Study/MOOC Approved by the College/Online Classes)	3	0	0	0	4.5	40	60	3	3
3	C	R25OE27XX	OE	OE	Open Elective – II (Internship Students: Self Study/MOOC Approved by the College/Online Classes)	3	0	0	0	4.5	40	60	3	3
4	D	R25SMP704	SR	SR	Seminar (Symposium)	0	0	3	0	1.5	40	60	2	3
PRACTICALS														
5	I	R25CPR705	PR/IP	PR/IP	Option 1: Capstone Project	0	0	0	12	12	100	0	4	10
6		R25INR705	PR/IP	PR/IP	Option 2: Industry Internship [#]					-	100	0		
VALUE ADDED COURSES														
7	H	-	VA	CC	Honours Course	3	0	0	0	4.5			4	4
Total										27/ 31.5*			15/ 19*	22/ 26*

* The students can take the internship option either in 7th or in 8th semester.

* **Option 1:** Work on a Project in the institute/department under the mentorship of faculty members.

Option 2: Full semester Internship in Industry/organization (7th or 8th semester)



EIGHTH SEMESTER: Computer Science and Engineering														
Sl. No:	Slot	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit				SS	Total		Credits	Hrs/Week
						L	T	P	R		CAE	ESE		
THEORY														
1	A	R25PE68XX	PE	PE	Professional Elective - VI (Internship Students: Self Study/MOOC Approved by the College/Online	3	0	0	0	4.5	40	60	3	3
2	B	R25OE38XX	OE	OE	Open Elective - III (Internship Students: Self Study/MOOC Approved by the College/Online Classes)	3	0	0	0	4.5	40	60	3	3
PRACTICALS														
3	I	R25CPR803	PR/ IP	PR/IP	Option 1: Capstone Project Phase - II Option 2: Industry Internship (4 – 6 months) * Option 3: Capstone Project Phase - II	0	0	0	12	12	100	0	4	12
										100				
		M25CP2803												
Total										21			10	18

Professional Electives

1. Software Engineering

1. Software Engineering – Level 3
2. Software Project Management – Level 3
3. Agile Software Development – Level 3
4. Software Testing - Level 3/ Level 5
5. Formal Methods in Software Engineering- Level 3 / Level 5
6. Software Architecture – Level 3/Level 5

2. Cyber security

1. Foundations of Security in Computing- Level 3
2. Fundamentals of Cyber Security – level 3
3. Cyber Ethics Privacy and legal issues Level 3
4. Block Chain and Cryptocurrencies – Level 3/Level 5
5. Digital Forensics- Level 3/ Level 5
6. Network and Cloud Security- Level 3/Level 5

3. Artificial Intelligence and Machine Learning

1. Soft Computing – Level 3
2. Data Analytics- Level 3
3. Deep Learning- Level 3
4. Natural Language Processing – Level 3/ Level 5
5. Responsible AI- Level 3/ Level 5
6. Generative AI and LLM – Level 3/ Level 5

4. Advanced Algorithm and Data Structures

1. Advanced Data Structures – Level 3
2. Advanced Graph Algorithms – Level 3
3. Randomised Algorithms – Level 3
4. Approximation Algorithms – Level 3/ Level 5
5. Parallel Algorithms- Level 3/ Level 5
6. Computational Complexity – Level 3/ Level 5

5. General Stream

1. Cloud Computing - Level 3
2. Internet of Things- Level 3
3. Full Stack Web Development- Level 3/Level 5
4. Human Computer Interaction- Level 3/Level 5
5. Big Data Technologies- Level 3/Level 5
6. Ethical hacking- Level 3

5. Language Electives

1. German Language – Level A1.1
2. French Language – Level 1
3. Japanese Language

Open Electives**Open Elective Group 1**

1. Introduction to Cyber Security
2. Artificial Intelligence
3. Web Development
4. Software Engineering

Open Elective Group 2

1. Data Structures
2. Machine Learning for Engineers
3. Object Oriented Programming
4. Computer Networks

Open Elective Group 3

1. Prompt Engineering
2. Software Testing
3. Software Architectures
4. Introduction to Algorithms

Open Elective Group 4

1. Sustainable Energy Systems and Technologies
2. Introduction to Sustainable Manufacturing
3. Waste Heat Recovery and Utilization
4. Sustainable Design of Industries

Open Elective Group 5

1. Introduction to Indian Knowledge Systems
2. Humanities and Social Sciences in IKS
3. Science, Engineering and Technology in IKS
4. Indian Knowledge System: Concepts and Applications in Engineering

SEMESTER 3 & 4**Minor course Baskets**

Basket 1	ARTIFICIAL INTELLIGENCE AND DATA SCIENCE
Basket 2	CYBER SECURITY AND PRIVACY
Basket 3	SYSTEMS AND CLOUD SOFTWARE ENGINEERING

BASKET 1 - MINOR IN ARTIFICIAL INTELLIGENCE AND DATA SCIENCE**LIST OF NPTEL COURSES**

	Course Name	Duration	Credit	Link
ODD SEM	Introduction to Machine Learning	12 weeks	4	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs133
	Artificial Intelligence : Search Methods for Problem solving	12 weeks	4	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs132
EVEN SEM	Deep Learning	12 weeks	4	https://onlinecourses.nptel.ac.in/noc26_cs66/preview
	Natural Language Processing	12 weeks	4	https://onlinecourses.nptel.ac.in/noc26_cs45/preview

BASKET 2 - MINOR IN CYBER SECURITY AND PRIVACY

	Course Name	Duration	Credit	Link
ODD SEM	Ethical Hacking	12 weeks	4	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs157
	Cyber Security and Privacy	12 weeks	4	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs144

<u>EVE</u> <u>N</u> <u>SEM</u>	Cryptography and Network Security	12 weeks	4	https://onlinecourses.nptel.ac.in/noc26_cs57/preview
	Blockchain and its Applications	12 weeks	4	https://onlinecourses.nptel.ac.in/noc26_cs34/preview

BASKET 3 - MINOR IN SYSTEMS AND CLOUD SOFTWARE ENGINEERING

	Course Name	Duration	Credit	Link
ODD SEM	Software Engineering	12 weeks	4	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs151
	Computer Architecture and Organization	12 weeks	4	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs166
<u>EVE</u> <u>N</u> <u>SEM</u>	Cloud Computing	12 weeks	4	https://onlinecourses.nptel.ac.in/noc26_cs55/preview
	Object Oriented System Development using UML, Java And Patterns	12 weeks	4	https://onlinecourses.nptel.ac.in/noc26_cs46/preview