



**CHRIST COLLEGE OF ENGINEERING
(AUTONOMOUS)
(A CMI Institution)**

**DEPARTMENT OF COMPUTER SCIENCE &
ENGINEERING (DS)**

B. Tech. CURRICULUM – 2025

Date: 15-07-2026

Irinjalakuda, Thrissur – 680125

B. TECH. COMPUTER SCIENCE & ENGINEERING (DS)



A CMI INSTITUTION

CHRIST COLLEGE OF ENGINEERING (AUTONOMOUS)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (DATA SCIENCE) CURRICULUM 2025 REGULATION

Approved by BoS meeting held on: 19-06-26

Approved by Academic Council meeting held on: 23-06-26

BoS Chairperson

Dr. Nitha C Velayudhan

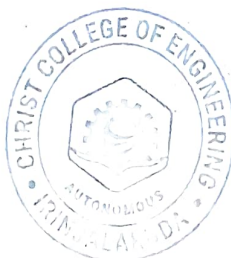
Director of Academics

Dr. Manoj George

Principal

Dr. Solomon P. A.

CHAIRPERSON
Board of Studies
B.Tech Computer Science &
Engineering (Data Science)
Christ College of Engineering
(Autonomous)
Irinjalakuda, Kerala



B. Tech. Computer Science and Engineering (DS)

2025 Curriculum - Programme Structure

Semester (Credits)	S1	S2	S3	S4	S5	S6	S7	S8	Total	%	AICTE
Humanities and Social Science Course including Management Course (HM)	1	1	3	3	3	2	0	0	13	7.8	7.5
Basic Science Course (BS)	7	7	3	3	0	0	0	0	20	12	18.1
Engineering Science Course (ES)	12	11	0	0	1	0	0	0	24	14.4	16.87
Programme Core Courses (PC)	0	4	15	15	15	18	0	0	67	40.1	36.25
Programme Elective Course (PE)	0	0	0	3	3	3	6	3	18	10.8	5.6
Open Elective Course (OE)	0	0	0	0	0	3	3	3	9	5.4	5.6
Skill Enhancement Course (SE)	0	2	1	1	1	1	0	0	6	3.6	0
Project/ Internship/Seminar (PR/IP/SR)	0	0	0	0	0	0	6	4	10	6	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	
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 & Engineering (DS)														
10 Days Compulsory Induction Program and Universal Human Values														
Sl. No:	S l o t	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit Structure				SS	Total Marks		Credits	Hrs./Week
						L	T	P	R		CIE	ESE		
THEORY														
1	A	G25MAT121	BS	GC	Mathematics for Physical Science-1	3	0	0	0	4.5	40	60	3	3
2	B	G25CYE123	BS	GC	Chemistry for Physical Science	3	0	2	0	5.5	40	60	4	5
3	C	G25EGE104	ES	GC	Engineering Graphics & Computer Aided Drawing	2	0	2	0	4	40	60	3	3
4	D	G25EET105	ES	GC	Basics of Electrical and Electronics Engineering (Part 1: Electrical 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	G25EWP107	ES	GC	Basic Electrical and Electronics Engineering Workshop	0	0	2	0	1	40	60	1	2
7	I	A25LSE109	HM	CC	Life Skills and Professional Communication	2	0	1	0	3.5	100	0	1	3
MANDATORY COURSES														
8	-	-	MC	MC	Activity Point Programme ^s								0	-
Total										30			20	25

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

[§] **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 & Engineering (DS)															
Sl. No:	S lot	Course Code	Co urs e Typ e	Cours e Cate gory	Course Title (Course Name)	Credit Structure				SS	Total Marks		Credi ts	Hrs./ Wee k	
						L	T	P	R		CIE	ESE			
THEORY															
1	A	G25MAT221	BS	GC	Mathematics for Physical Science-2	3	0	0	0	4.5	40	60	3	3	
2	B	G25PYE122	BS	GC	Physics for Physical Science	3	0	2	0	5.5	40	60	4	5	
3	C	G25PRE204	ES	GC	Programming in C	2	0	2	0	4	40	60	4	4	
4	D	G25FOT205	ES	GC	Foundations of Computing: From Hardware Essentials to Web Design	3	0	0	0	4.5	40	60	3	3	
5	E	D25DMT206	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*	A25HWE108	HM	CC	Health and wellness	1	0	1	0	0	40	0	1	2	
8	L	G25EWP210	ES	CC	Workshop Practices	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										31.5			25	29	

THIRD SEMESTER: Computer Science & Engineering (DS)														
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		CIE	ESE		
THEORY														
1	A	G25PRT311	BS	GC	Probability Distributions and Random Processes	2	1	0	0	3.5	40	60	3	3
2	B	D25OPR302	PC-PBL	PC	Object Oriented Programming using Java	2	1	0	1	4.5	60	40	4	4
3	C	D25DET303	PC	PC	Digital Electronics & Microcontrollers	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	A25AEP306	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	A25EDR359	SE	CC	Engineering Design and Innovation Studio (EDIS-I)	0	0	0	2	1	50	-	1	2
9	J	D25PSP310	PC	PC	Python and Statistical Modeling Lab	0	0	3	0	1.5	50	50	2	3
MANDATORY NON-CREDIT COURSES														
10	K	A25UHE311	MC	CC	Universal Human Values and Professional Ethics	1	0	1	0	2	40	60	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										27/32*			22/26*	27/31*

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

FOURTH SEMESTER: Computer Science & Engineering (DS)															
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		CIE	ESE			
THEORY															
1	A	G25GTT401	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	D25COT403	PC	PC	Computer Organization and Architecture	3	1	0	0	5	40	60	4	4	
4	D	D25DWR404	PC-PBL	PC	Database Management Systems and Data Warehousing	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	
6	F	D25PE14XX	PE	PE	Professional Elective - 1	3	0	0	0	4.5	40	60	3	3	
7	G	G25CIT406	HM	CC	Indian Constitution	1	0	0	0	1.5	50	-	1	1	
PRACTICALS															
8	H	R25OSP407	PC	PC	Operating Systems Lab	0	0	3	0	1.5	50	50	2	3	
9	I	A25EDR459	SE	CC	Engineering Design and Innovation Studio (EDIS-II)	0	0	0	2	2	50	-	1	2	
10	J	D25DWP410	PC	PC	DBMS and Data Warehousing Lab	0	0	3	0	1.5	50	50	2	3	
MANDATORY NON-CREDIT COURSES															
11	K	A25BCT415	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 & Engineering (DS)														
Sl. No:	S I o t	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit Structure				SS	Total Marks		Credits	Hrs./ Week
						L	T	P	R		CIE	ES E		
THEORY														
1	A	R25TOT501	PC	PC	Theory of Computation	3	0	0	0	4.5	40	60	3	3
2	B	D25DAR502	PC-PBL	PC	Data Analytics	2	1	0	1	4.5	60	40	4	4
3	C	D25CNT503	PC	PC	Computer Networks	3	1	0	0	5	40	60	4	4
4	D	D25MGT504	HM	CC	Management for Engineers	3	0	0	0	4.5	40	60	3	3
5	E	D25PE25XX	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	D25DAP507	PC	PC	Data Analytics Lab	0	0	3	0	1.5	50	50	2	3
8	H	D25NWP508	PC	PC	Networks Lab	0	0	3	0	1.5	50	50	2	3
9	I	A25EDR559	SE	CC	Engineering Design and Innovation Studio (EDIS-III)	0	0	0	2	2	50	-	1	2
MANDATORY NON-CREDIT COURSES														
10	J	A25QRT510	MC	CC	Quantitative and Reasoning Skills	1	0	0	0	1.5	50	-	Pass/Fail	1
ACTIVITY POINT PROGRAMME														
12	-	A25APP511	MC	CC	Activity Point Programme								-	-
VALUE ADDED COURSES														
13	M/H	-	VA	CC	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*			23/27*	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 & Engineering (DS)														
SL. No:	S l o t	Course Code	Cour se Type	Cou rse Cate gory	Course Title (Course Name)	Credit Structure				SS	Total Marks		Credi ts	Hrs./ Wee k
						L	T	P	R		CIE	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	D25BDT603	PC	PC	Big Data Processing	2	1	0	0	3.5	40	60	3	3
4	D	D25MDR604	PC-P BL	PC	Machine Learning and Deep Learning for Data Science	2	1	0	1	4.5	60	40	4	4
5	E	D25PE36XX	PE	PE	Professional Elective – III*	3	0	0	0	4.5	40	60	3	3
6	C	D25OE16XX	OE	OE	Open Elective – I [#]	3	0	0	0	4.5	40	60	3	3
7	J	A25FLT607	HM	CC	Foreign Language Elective #	2	0	0	0	3	50	-	2	2
PRACTICALS														
8	G	D25MDP608	PC	PC	<i>Machine Learning and Deep Learning for Data Science Lab</i>	0	0	3	0	1.5	50	50	2	3
9	I	A25EDR659	SE	CC	Engineering Design and Innovation Studio (EDIS-IV)	0	0	0	2	2	50	-	1	2
10	H	D25BDP610	PC	PC	Big Data Processing Lab	0	0	0	3	1.5	50	50	2	3
ACTIVITY POINT PROGRAMME														
11	-	A25APP611	MC	CC	Activity Point Programme \$									
VALUE ADDED COURSES														
12	M	-	VA	CC	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 & Engineering (DS)															
Sl. No:	S l o t	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit Structure				SS	Total Marks		Credits	Hrs./Week	
						L	T	P	R		CIE	ESE			
THEORY															
1	A	D25PE47XX	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	D25PE57XX	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	D25OE27XX	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	D25SMP704	SR	SR	Seminar (Symposium)	0	0	3	0	1.5	40	60	2	3	
PRACTICALS															
5	I	D25CP1705	PR/IP	PR/IP	Option 1: Capstone Project	0	0	0	12	12	100	0	4	10	
6		D25INI705	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 & Engineering (DS)														
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		CIE	ESE		
THEORY														
1	A	D25PE68XX	PE	PE	Professional Elective - VI (Internship Students: Self Study/MOOC Approved by the College/Online Classes)	3	0	0	0	4.5	40	60	3	3
2	B	D25OE38XX	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	D25CPR803	PR/IP	PR/IP	Option 1: Capstone Project Option 2: Industry Internship (4 – 6 months) * Option 3: Capstone Project Phase - II	0	0	0	12	12	100	0	4	12
		D25INR803	PR/IP	PR/IP						100				
		D25CP2803	PR/IP	PR/IP										
Total										21			10	18

Professional Electives

1. Theoretical Computer Science

1. Computational Complexity - Level 3
2. Computational Number Theory - Level 3
3. Software Engineering for Data Science - Level 3
4. Probabilistic Methods in Computer Science – Level 3/ Level 5
5. Information Theory – Level 3/ Level 5
6. Soft Computing – Level 3/ Level 5

2. Cybersecurity

1. Data and Information Security - Level 3
2. Internet of Things - Level 3
3. Modern Cryptography - Level 3
4. Ethical Hacking - Level 3/ Level 5
5. Cyber Forensics and Malware - Level 3/ Level 5
6. Social Network Security - Level 3/ Level 5

3. Computer Graphics & Visualization

1. Computer Graphics and Image Processing - Level 3
2. Multimedia Data Compression and Storage - Level 3
3. Computer Vision - Level 3
4. Stream Processing - Level 3/ Level 5
5. Augmented and Virtual Reality - Level 3/ Level 5
6. Data Exploration and Visualization - Level 3/ Level 5

4. Artificial Intelligence & Machine Learning

1. Optimization Techniques - Level 3
2. Data Mining and Business Intelligence - Level 3
3. Foundations of Pattern Recognition - Level 3
4. Machine Learning Applications - Level 3/ Level 5
5. Natural Language Processing - Level 3/ Level 5
6. Explainable AI - Level 3/ Level 5

5. General Stream

1. Technology Innovation and Entrepreneurship - Level 3
2. Programming in R - Level 3

3. Data-Driven Disaster Management -Level 3
4. Cloud Computing - Level 3/ Level 5
5. Cyber Security and Digital Privacy - Level 3/ Level 5
6. Introduction to Quantum Computing - Level 3/ Level 5

6. Language Electives

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

Open Electives

Open Elective Group 1

1. Data Structures
2. Object Oriented Programming
3. Database Management System

Open Elective Group 2

1. Software Engineering
2. Cyber Security
3. Foundations of Cryptography

Open Elective Group 3

1. Introduction to Algorithms
2. Internet of Things
3. Software Testing

Open Elective Group 4

1. Web Programming
2. Mobile Application Development
3. Cloud Computing

Open Elective Group 5

1. Computer Graphics
2. Computer Networks
3. Machine Learning for Engineers

SEMESTER 3 & 4**Minor course Baskets**

Basket 1	AI and Machine Learning
Basket 2	Data Science and Intelligent Computing
Basket 3	Cyber Security and Software Systems

BASKET 1 - Minor in AI and Machine Learning
LIST OF NPTEL COURSES

	Course Name	Duration	Credit	Link
ODD SEM	Artificial Intelligence: Foundations and Algorithms	12 weeks	4	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs182
	Computer Vision	12 weeks	4	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs158
EVEN SEM	Introduction to Machine Learning	12 weeks	4	https://onlinecourses.nptel.ac.in/noc26_cs74/preview
	Deep Learning	12 weeks	4	https://onlinecourses.nptel.ac.in/noc26_ee53/preview

BASKET 2 - Minor in Data Science and Intelligent Computing
LIST OF NPTEL COURSES

	Course Name	Duration	Credit	Link
ODD SEM	Natural Language Processing	12 weeks	4	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ce160
	Cloud Computing	12 weeks	4	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs158
EVEN SEM	Data Science for Engineers	12 weeks	4	https://onlinecourses.nptel.ac.in/noc26_cs65/preview
	Discrete Mathematics	12 weeks	4	https://onlinecourses.nptel.ac.in/noc26_cs68/preview

BASKET 2 - Minor in Cyber Security and Software Systems
LIST OF NPTEL COURSES

	Course Name	Duration	Credit	Link
ODD SEM	Ethical Hacking	12 weeks	4	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs157
	Software Project Management	12 weeks	4	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs152
<u>EVEN SEM</u>	Cryptography and Network Security	12 weeks	4	https://onlinecourses.nptel.ac.in/noc26_cs57/preview
	Software Testing	12 weeks	4	https://onlinecourses.nptel.ac.in/noc26_cs59/preview

