

Curriculum Structure
of
B. Tech in Computer Science and Engineering
Based on
AICTE Model Curriculum 2022

The structure of B. Tech program in Computer Science and Engineering shall have essentially the following categories of courses with the breakup of credits as given:

S. No.	Category	Credit Breakup
1	Humanities and Social Sciences including Management courses	13
2	Basic Science courses	22
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc.	19
4	Professional core courses	66
5	Professional Elective courses relevant to chosen Specialization / branch	15
6	Open subjects – Electives from other technical and /or emerging subjects	9
7	Project work, seminar and internship in industry or elsewhere	20
8	Mandatory Courses [Environmental Sciences, Induction Program, Indian Constitution, Essence of Indian Knowledge Tradition]	(non-credit)
	Total	164

Course code and definition:

Course code	Definitions
L	Lecture
T	Tutorial
P	Practical
C	Credits
BSC	Basic Science Courses
ESC	Engineering Science Courses
HSMC	Humanities and Social Sciences including Management courses
PCC-CS	Professional core courses
PEC-CS	Professional Elective courses
OEC-CS	Open Elective courses
LC	Laboratory course
MC	Mandatory courses

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Semester wise Structure and Curriculum
B. Tech in Computer Science and Engineering

SEMESTER - I							
S. No.	Course Code	Course Title	L	T	P	Credits	Remarks
	APMS100	Mathematics-I	3	1	0	4	BSC
	APPH100	Physics-I	3	1	0	4	BSC
	APPH101	Physics Lab	0	0	1	1	BSC
	EEBT100	Basic Electrical Engineering	2	1	0	3	ESC
	EEBT101	Basic Electrical Engineering Lab	0	0	1	1	ESC
	CEBT100	Engineering Graphics & Design	1	0	2	3	ESC
	DDBD100	Design Thinking	0	0	1	1	HSMC
	SEEC100	Environmental Sciences	2	0	1	0	MC
	SEEC101	Biology for Engineers	3	0	0	3	BSC
	SEIP100	Induction Program	-	-	-	0	MC
Total						20	

SEMESTER - II							
S. No.	Course Code	Course Title	L	T	P	Credits	Remarks
	APMS101	Mathematics-II	3	1	0	4	BSC
	APCH100	Chemistry-I	3	0	0	3	BSC
	APCH101	Chemistry Lab	0	0	1	1	BSC
	CSBT100	Programming for Problem Solving	2	0	0	2	ESC
	CSBT101	Programming Lab	0	0	2	2	ESC
	MEBT100	Manufacturing Practices Workshop	0	0	2	2	ESC
	SEEC102	English	2	0	0	2	HSMC
	SEEC103	Language Lab	0	0	1	1	HSMC
	SEEC104	Universal Human Values	2	1	0	3	HSMC
	SESP100	Sports and Yoga/NSS/NCC	2	0	2	0	Audit Course
	ESCxxx	Basic Electronics	2	0	0	2	ESC
	ESCxxx	Basic Electronics Lab	0	0	1	1	ESC
Total						23	

Credit Completed: 43

EXIT POINT 1: Certificate in Engineering (additional requirement: internship of 6 – 8 weeks duration after 2nd semester)

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SEMESTER - III							
S. No.	Course Code	Course Title	L	T	P	Credits	Remarks
	CSBT201	Discrete Mathematics	3	1	0	4	PCC
	CSBT202	Data structures	3	1	0	4	PCC
	CSBT203	Data structures laboratory	0	0	2	2	PCC
	CSBT204	Digital Logic Design	3	0	1	4	PCC
	CSBT205	IT Workshop (SciLab/MATLAB/Python etc.)	1	0	2	3	PCC
	APMS201	Mathematics-III (Differential Calculus)	2	0	0	2	BSC
	DDBD200	IDEA Lab Workshop	2	0	2	0	Audit Course
Total						19	
		Minor/Major Elective Course 1	3	0	0	3	Minor/Major

SEMESTER - IV							
S. No.	Course Code	Course Title	L	T	P	Credits	Remarks
	CSBT211	Computer Organization & Architecture	3	0	0	3	PCC
	CSBT212	Computer Organization & Architecture Laboratory	0	1	1	2	PCC
	CSBT213	Design & Analysis of Algorithms	3	1	1	5	PCC
	CSBT214	Theory of Computation	3	1	0	4	PCC
	CSBT215	Advanced Programming	2	1	1	4	PCC
	SEEC200	Engineering Economics and Entrepreneurship	3	0	0	3	HSMC
Total						21	
		Minor/Major Elective Course 2	3	0	0	3	Minor/Major

Credit Completed: 83

EXIT POINT 2: Diploma in Computer Sc. and Engineering (additional requirement: internship of 6 – 8 weeks duration after 4th semester)

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SEMESTER - V

SEMESTER - V							
S. No.	Course Code	Course Title	L	T	P	Credits	Remarks
	ESCxxx	Signals & Systems	3	0	0	3	ESC
	CSBT301	Introduction to Database Systems	3	0	0	3	PCC
	CSBT302	Database Systems Laboratory	0	0	2	2	PCC
	CSBT303	Graph Theory	3	0	0	3	PCC
	CSBT304	Operating Systems	3	0	0	3	PCC
	CSBT305	Operating Systems Laboratory	0	0	2	2	PCC
		Elective-I	3	0	0	3	PEC
	SEEC300	Professional Practice, Law & Ethics of engineering	3	0	0	0	MC
	SEEC301	Constitution of India	1	0	0	0	MC
Total						19	
		Minor/Major Elective Course 3	3	0	0	3	Minor/Major

SEMESTER - VI

SEMESTER - VI							
S. No.	Course Code	Course Title	L	T	P	Credits	Remarks
	CSBT311	Computer Networks	3	0	0	3	PCC
	CSBT312	Computer Networks Laboratory	0	0	2	2	PCC
	CSBT313	Introductory Cyber Security	3	0	1	4	PCC
	SEEC302	Finance & Accounting	3	0	0	3	HSMC
	SEEC303	Essence of Indian Knowledge Tradition	1	0	0	0	MC
		Elective-II	3	0	0	3	PEC
		Elective-III	3	0	0	3	PEC
	CSBT315	Project-I	0	0	2	2	PROJ
Total						20	
		Minor/Major Elective Course 4	3	0	0	3	Minor/Major

EXIT POINT 3: Advanced Diploma in Computer Sc. and Engineering (additional requirement: internship of 6 – 8 weeks duration after 6th semester)

Credit Completed: 122

EXIT POINT 3: Advanced Diploma
internship of 6 – 8 weeks duration after 6th semester)

Credit Completed: 122

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SEMESTER - VII							
S. No.	Course Code	Course Title	L	T	P	Credits	Remarks
	CSBT401	Machine Learning	3	0	1	4	PCC
	CSBT402	Compiler Design	3	0	2	5	PCC
	CSBT403	Project-II	0	0	6	6	PROJ
		Elective-IV	3	0	0	3	PEC
		Open Elective-I	3	0	0	3	OEC
		Internship	-	-	-	-	MC
Total						21	
		Minor/Major Elective Course 5	3	0	0	3	Minor/Major

SEMESTER - VIII							
S. No.	Course Code	Course Title	L	T	P	Credits	Remarks
	CSBT411	Project-III	0	0	12	12	PROJ
		Elective-V	3	0	0	3	PEC
		Open Elective-II	3	0	0	3	OEC
		Open Elective-III	3	0	0	3	OEC
Total						21	
		Minor/Major Elective Course 6	3	0	0	3	Minor/Major

EXIT POINT 4: B. Tech in Computer Sc. and Engineering

Total Credit: 164

Professional Elective courses:

Old Course Code	New Course Code	Course Name	L-T-P	Credit
CO304	CSBT351	Principles of Programming Languages	3-0-0	3
CO306	CSBT352	Embedded Systems	3-0-1	4
CO311	CSBT353	Software Engineering	3-0-0	3
CO303	CSBT354	Computer Graphics	3-0-1	4
CO218	CSBT355	Data Communication	3-0-0	3
CO318	CSBT356	Cryptography	3-0-0	3

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CO518	CSBT357	Cloud Computing	3-0-0	3
CO519	CSBT358	Internet of Things	3-0-0	3
CO432	CSBT359	Information Theory and Coding	3-0-0	3
CO319	CSBT360	Statistical Modelling and Applications	3-0-0	3
CO401	CSBT451	Artificial Intelligence	3-0-0	3
CO423	CSBT452	Web Technology	3-0-1	4
CO503	CSBT453	Fuzzy Logic and Neural Networks	3-0-0	3
CO435	CSBT454	Mobile Computing	3-0-0	3
CO525	CSBT455	Data Mining	3-0-0	3
CO504	CSBT456	Natural Language Processing	3-0-0	3
CO520	CSBT457	Software Defined Networking and Network Function Virtualization	3-0-0	3
CO521	CSBT458	Computational Geometry	3-0-0	3
CO522	CSBT459	Bioinformatics	3-0-0	3
CO426	CSBT460	Advanced Computer Architecture	3-0-1	4
CO406	CSBT461	Distributed Systems	3-0-1	4
CO509	CSBT462	Computer Vision & Image Processing	3-0-1	4
CO512	CSBT463	Parallel Programming	3-0-1	4
CO513	CSBT464	Fundamentals of Speech Processing	3-0-1	4
CO515	CSBT465	Knowledge Representation and Reasoning	4-0-0	4
CO516	CSBT466	Advanced Algorithms	4-0-0	4
CO517	CSBT467	Virtual and Augmented Reality	3-0-1	4
CO523	CSBT468	Quantum Computing	3-0-0	3
CO524	CSBT469	Linear Optimization	3-0-0	3
CO505	CSBT470	Advanced Database Management System	3-0-0	3
CO526	CSBT471	Operation Research	3-0-0	3

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Professional Elective courses from MOOC:

Old Course Code	New Course Code	Name	Duration (weeks)	Credit	Degree
CS654	CSBT38x	Programming, data structures and algorithms using Python	8	2	UG
CS667	CSBT38x	Introduction To Soft Computing	8	2	UG/PG
CS660	CSBT38x	Programming in Java	12	3	UG
CS661	CSBT38x	Data Science for Engineers	8	2	UG/PG
CS672	CSBT38x	Ethical Hacking	12	3	UG/PG
CS673	CSBT38x	Demystifying networking	4	1	UG/PG
CS678	CSBT38x	The Joy of Computing Using Python	12	3	UG/PG
CS683	CSBT38x	Data Analytics with Python	12	3	UG/PG
CS662	CSBT48x	Machine Learning for Engineering and science applications	12	3	UG/PG
CS666	CSBT48x	Embedded System Design with ARM	8	2	UG
CS658	CSBT48x	Social Networks	12	3	UG
CS670	CSBT48x	Deep Learning (offered by IIT Ropar)	12	3	UG/PG
CS671	CSBT48x	Reinforcement Learning	12	3	UG/PG
CS681	CSBT48x	GPU Architectures and Programming	12	3	UG/PG
FE674	CSBT48x	Blockchain and its Applications	12	3	UG/PG

- Total credit of Minor courses from 3rd to 8th Semester: 18 credits
- Open Electives in 7th and 8th semester should be taken from SWAYAM (to be suggested by the department: 6 credits)

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