

CURRICULUM & SYLLABUS



CHOICE BASED CREDIT SYSTEM (CBCS)
FOR
BACHELOR OF TECHNOLOGY (B.Tech.)
(4 Year Undergraduate Degree Programme)
IN
COMPUTER SCIENCE AND ENGINEERING
(In alignment with National Education Policy, 2020)
[w. e. f. 2023-2024]

FACULTY OF ENGINEERING AND TECHNOLOGY
SRM UNIVERSITY DELHI-NCR, SONEPAT
39, Rajiv Gandhi Education City, Sonapat
Haryana-131029

B.TECH COMPUTER SCIENCE AND ENGINEERING
TABLE 3: PROGRAMME STRUCTURE

Category of Courses	Category	No. of Courses	
Basic Applied Sciences	BAS	7	
Engineering Sciences	ES	11	
Professional Core	PC	15	
Professional Electives -Program Specific Specialized Elective Courses	PE	11	
Ability Enhancement Courses	AEC	4	
Skill Enhancement courses (Technical and Soft skills)	SEC	Technical Skills	4
		Soft Skills	5
Value Added Courses	VAC	3	
Practical / Workshop	P/W	9	
Live Project & Industrial Visit and Summer Internship	LP /SI	Live Project and Industrial Visit	4 th -7 th Semester 4
		Minor Project	7 th Semester 1
		Major Project	8 th Semester 1
Multidisciplinary courses (Humanities and Social Sciences)(HSS)	MDC	3	
TOTAL		78	

**BACHELOR OF TECHNOLOGY
(COMPUTER SCIENCE AND ENGINEERING)**

DEGREE COURSE

TABLE 4: PROGRAMME CREDIT STRUCTURE SEMESTER WISE

Semesters → Courses	CATEGORY	I	II	III	IV	V	VI	VII	VIII	TOTAL	%AGE
Basic Applied Sciences	BAS	9	9	3	0	0	0	0	0	21	11.73
Engineering Sciences	ES	9	9	-	0	2	0	0	0	20	11.17
Professional Core Courses	PC	0	0	9	14	4	9	8	0	44	24.58
Professional Electives-Program Specific Specialization Electives	PE	0	0	4	4	11	8	8	0	35	19.55
Ability Enhancement Courses	AEC	5	2	-	-	-	0	0	0	7	3.35
Skill Enhancement Courses(Technical &Soft Skills)	SEC	0	0	2	2	2	2	1	0	9	5.03
Practicals/Workshops	P/W	0	0	3	2	1	2	1	0	9	5.03
Live Project & Industrial Visit and Summer Internship	LP/SI	0	0	0	1	1	1	5	12	20	11.17
Multidisciplinary courses (Humanities and Social Sciences)(HSS)	MDC	0	0	0	3	3	3	0	0	9	5.03
Value Added Courses	VAC	2	2	2	-	-	-	-	-	6	3.35
TOTAL		25	22	23	26	24	25	23	12	180	100.0

COURSE CURRICULUM
BACHELOR OF TECHNOLOGY
(COMPUTER SCIENCE AND ENGINEERING)
DEGREE COURSE

TABLE 5: PROGRAMME COURSES CREDIT STRUCTURE SEMESTER WISE

SEMESTER – I

SL.No	Code	Category	Course Name	Hours per week				Credits
				L	T	P	Total Hours	
Theory								
1	23AS101	(BAS)	Engineering Mathematics-I	3	1	0	4	4
2	23AS102/23AS103	(BAS)	Engineering Physics/Engineering Chemistry	3	1	0	4	4
3	23EE101/23EC101	(ES)	Basic Electrical Engineering /Basic Electronics Engineering	3	0	0	3	3
4	23ME101/23CS101	(ES)	Engineering Mechanics / Fundamentals of Computer & C Programming	3	0	0	3	3
5	23AEC101	(AEC)	Professional English (*50% of students will be offered)	2*	0	0	2*	2*
6	23AEC102/23AEC103/23AEC104	(AEC)	Hindi-I/German-I/French-I	2	0	0	2	2
7	23VAC101/23VAC102	(VAC)	Environmental BioEngineering / Indian Constitution and Polity	2	0	0	2	2
Total Credits (Theory)				16/18	2	0	18/20	18/20
Practical								
8	23AS152/23AS153	(BAS)	Engineering Physics Lab/Engineering Chemistry Lab	0	0	2	2	1
9	23EE151/23EC151	(ES)	Basic Electrical Engineering Lab /Basic Electronics Engineering Lab	0	0	2	2	1
10	23ME151/23CS151	(ES)	Basic Mechanical Engineering Lab/ C Programming Lab	0	0	2	2	1
11	23ME152/23ME153	(ES)	Mechanical Workshop Lab/Engineering Graphics & Design Lab	0	0	2	2	1
12	23AEC151*	(AEC)	Communication English Lab (50% of students will be offered)	0	0	2*	2*	1*
Total Credits (Practical)				0	0	8/10	8/10	4/5
	Total Credits (Theory + Practical)			16/18	2	8/10	26/30	22/25

SEMESTER – II

SL.No	Code	Category	Course Name	Hours per week				Credits
				L	T	P	Total Hour s	
Theory								
1	23AS0201	(BAS)	Engineering Mathematics-II	3	1	0	4	4
2	23AS0202/2 3AS0203	(BAS)	Engineering Physics/Engineering Chemistry	3	1	0	4	4
3	23EE0201/2 3EC0201	(ES)	Basic Electrical Engineering /Basic Electronics Engineering	3	0	0	3	3
4	23ME0201/2 3CS201	(ES)	Engineering mechanics / Fundamentals of Computer & C Programming	3	0	0	3	3
5	23AEC0201	(AEC)	Professional English (*50% of students will be offered)	2*	0	0	2*	2*
6	23AEC 202/23AEC203/AEC204	(AEC)	Hindi-II/German-II/French-II	2	0	0	2	2
7	23VAC201/2 3VAC 202	(VAC)	Indian Constitution and Polity/ Environmental Bioengineering	2	0	0	2	2
Total Credits (Theory)				16/18	2	0	18/20	18/20
Practical								
8	23AS0252/23 AS0253	(BAS)	Engineering Physics Lab/Engineering Chemistry Lab	0	0	2	2	1
9	23EE0251/2 3EC0251	(ES)	Basic Electrical Engineering Lab /Basic Electronics Engineering Lab	0	0	2	2	1
10	23ME251/23 CS251	(ES)	Basic Mechanical Engineering Lab/ C Programming Language Lab	0	0	2	2	1
11	23ME0251/2 1ME0252	(ES)	Mechanical Workshop Lab/Engineering Graphics & Design Lab	0	0	2	2	1
12	23AEC151*	(AEC)	Communication English Lab (50% of students will be offered)	0	0	2*	2*	1*
Total Credits (Practical)				0	0	8/10	8/10	4/5
Total Credits (Theory + Practical)				16/ 18	2	8/10	26/30	22/25

SEMESTER – III

COURSE CODE	COURSE	CATEGORY	HOURS PER WEEK				CREDITS
			L	T	P	TOTAL HOURS	
Theory							
23AS301	Engineering Mathematics-III	BAS	3	0	0	3	3
23CS2001	DATA STRUCTURES USING C	PC	3	0	0	3	3
23CSPExxx	Professional Elective-I	PE	3	1	0	4	4
23CS2005	Database Management Systems	PC	3	0	0	3	3
23CS2007	Programming in Python	PC	3	0	0	3	3
Total (Theory)			15	1	0	16	16
Practical							
23CS2015	Python Programming Lab	P	0	0	2	2	1
23CS2111	Database Management Systems Lab	P	0	0	2	2	1
23CS2113	DATA STRUCTURES USING C LAB	P	0	0	2	2	1
23AEC301	Sports, Yoga and Fitness	AEC	1	0	2	3	2
Total (Practical)			1	0	8	9	5
Skill Enhancement Course							
	Digital Marketing	SEC	0	0	2	2	1
23SS351	Effective Communication Skills	SEC	0	0	2	2	1
Total (Skill Enhancement)			0	0	4	4	2
Total (Theory + Practical+ Skill Enhancement)			16	1	12	29	23

NOTE: At the end of the semester, students will undergo a training and create a project which will be evaluated in the next semester (Live Project-I)

BACHELOR OF TECHNOLOGY
(COMPUTER SCIENCE AND ENGINEERING)
DEGREE COURSE
PROGRAMME COURSES STRUCTURE SEMESTER WISE
SEMESTER – IV

COURSE CODE	COURSE	CATEGORY	HOURS PER WEEK				CREDITS
			L	T	P	TOTAL HOURS	
Theory							
23 MDCXXX	Multidisciplinary Elective-I	MDC	3	0	0	3	3
23CSPE2004	Theory of Computation	PC	3	1	0	4	4
23CS2006	Operating Systems	PC	3	0	0	3	3
23CSPEXXX	Professional Elective -II	PE	3	0	0	3	3
23CS2010	Java Programming	PC	3	0	0	3	3
23CS2004	Discrete Structures	PC	3	1	0	4	4
Total (Theory)			18	2	0	20	20
Practical							
23CS2114	Operating Systems Lab	P	0	0	2	2	1
23CS2116	Java Programming Lab	P	0	0	2	2	1
23CSPEXXX	Professional Elective –II Lab	PE	0	0	2	2	1
Total (Practical)			0	0	6	6	3
Skill Enhancement Course							
23CS0204	Live Project-I &Industrial Visit	LP**	0	0	2	2*	1
	Introduction to SPSS	SEC	0	0	2	2*	1
23SS452	Teamwork & Interpersonal Skills	SEC	0	0	2	2	1
Total (Skill Enhancement)			0	0	6	4	3
Total (Theory + Practical+ Skill Enhancement)			18	2	12	30	26

*- Teaching Load

NOTE: At the end of the semester, students will undergo a training and create a project which will be evaluated in the next semester (Live Project-II)

** To be evaluated in current semester.

BACHELOR OF TECHNOLOGY
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DEGREE COURSE
PROGRAMME COURSES STRUCTURE SEMESTER WISE
SEMESTER – V

COURSE CODE	COURSE	CATEGORY	HOURS PER WEEK				CREDITS
			L	T	P	TOTAL HOURS	
Theory							
23MDCXXX	Multidisciplinary Elective-II	MDC	3	0	0	3	3
23CSPE3001	Compiler Design	PC	3	1	0	4	4
23CSPExxx	Professional Elective -III	PE	3	1	0	4	4
23CSPExxx	Professional Elective -IV	PE	3	0	0	3	3
23CSPExxx	Professional Elective -V	PE	3	0	0	3	3
Total (Theory)			15	2	0	17	17
Practical							
23CSPE3113	Professional Elective -III Lab	PE	0	0	2	2	1
23CSPExxx	Compiler Design Lab	P	0	0	2	2	1
23CS0303	Live Project-II &Industrial Visit	LP**	0	0	2	2	1
23CS2115	Programming using MATLAB	ES	1	0	2	3	2
Total (Practical)			1	0	8	9	5
Skill Enhancement Course							
	Introduction to Hardware Description Language	SEC	0	0	2	2	1
23SS553	Presentation Skills	SEC	0	0	2	2	1
Total (Skill Enhancement)			0	0	4	4	2
Total (Theory + Practical+ Skill Enhancement)			16	2	12	30	24

NOTE: At the end of the semester, students will undergo a training and create a project which will be evaluated in the next semester (Live Project-III)

**** To be evaluated in current semester.**

BACHELOR OF TECHNOLOGY
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DEGREE COURSE
PROGRAMME COURSES STRUCTURE SEMESTER WISE
SEMESTER – VI

COURSE CODE	COURSE	CATEGORY	HOURS PER WEEK				CREDITS
			L	T	P	TOTAL HOURS	
Theory							
23CS3002	Artificial Intelligence & Expert System	PC	3	0	0	3	3
23CSPE3004	Software Engineering	PC	3	0	0	3	3
23CS3012	Big data & Analytics	PC	3	0	0	3	3
23CSPExxx	Professional Elective – VI	PE	3	1	0	4	4
23CSPExxx	Professional Elective – VII	PE	3	1	0	4	4
23MDCXXX	Multidisciplinary Elective-III	MDC	3	0	0	3	3
Total (Theory)			18	2	0	20	20
Practical							
23CS3114	Artificial Intelligence & Expert System Lab	P	0	0	2	2	1
23CSPE3118	Software Engineering Lab	P	0	0	2	2	1
23CS0304	Live Project-III& Industrial Visit	LP**	0	0	2	2	1
Total (Practical)			0	0	6	6	3
Skill Enhancement Course							
	Wearable Technologies	SEC	0	0	2	2	1
23SS654	Professional Skills	SEC	0	0	2	2	1
Total (Skill Enhancement)			0	0	4	4	2
Total (Theory + Practical+ Skill Enhancement)			18	2	10	30	25

NOTE: At the end of the semester, students will undergo a training and create a project which will be evaluated in the next semester (Live Project-IV)

**** To be evaluated in current semester.**

BACHELOR OF TECHNOLOGY
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DEGREE COURSE
PROGRAMME COURSES STRUCTURE SEMESTER WISE
SEMESTER – VII

COURSE CODE	COURSE	CATEGORY	HOURS PER WEEK				CREDITS
			L	T	P	TOTAL	
Theory							
23CS4003	Cloud Computing	PC	3	1	0	4	4
23CS4005	Web Application Development	PC	3	1	0	4	4
23CSPExxx	Professional Elective Course – VIII	PE	3	1	0	4	4
23CSPExxx	Professional Elective Course – IX	PE	3	1	0	4	4
Total (Theory)			12	4	0	16	16
Practical							
23CS4113	Cloud Computing Lab	P	0	0	2	2	1
23CS4115	Live project-IV & Industrial Visit	LP**	0	0	2	2	1
23CS4117	Minor Project	LP	0	0	8	8	4
Total (Practical)			0	0	12	12	6
Skill Enhancement Course							
23AR755	Aptitude and Reasoning	SEC	0	0	2	2	1
Total (Skill Enhancement)			0	0	2	2	1
Total (Theory + Practical+ Skill Enhancement)			12	4	14	30	23

NOTE: ** To be evaluated in current semester.

BACHELOR OF TECHNOLOGY
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DEGREE COURSE
PROGRAMME COURSES SRUCTURE SEMESTER WISE

SEMESTER – VIII

COURSE CODE	COURSE	CATEGORY	HOURS PER WEEK				CREDITS
			L	T	P	TOTAL	
23CS4114	Major Project	LP	0	0	24	24	12
Total (Theory + Practical+ Skill Enhancement)			0	0	24	24	12

* To be monitored at the Institute Level

**Teaching Load

LIST OF ABILITY ENHANCEMENT COURSES

Course Code	Course	Category	L	T	P	Credits
23AEC101/23AEC151	Professional English/Communicative English Lab	AEC	2	0	2	3
23AEC102/ 23AEC103/ 23AEC104	Hindi-I/FRENCH-I/GERMAN-I	AEC	2	0	0	2
23AEC202/ 23AEC203/ 23AEC204	Hindi-II/ FRENCH-II/GERMAN-II	AEC	2	0	0	2

LIST OF SKILL ENHANCEMENT COURSES

Course Code	Course	Category	L	T	P	Credits
TECHNICAL TRAINING						
	Digital Marketing	SEC	0	0	2	1
	Introduction to SPSS	SEC	0	0	2	1
	Introduction to Hardware Description Language	SEC	0	0	2	1
	Wearable Technologies	SEC	0	0	2	1
SOFT SKILL						
23SS351	Effective Communication Skills	SEC	0	0	2	1
23SS452	Teamwork & Interpersonal Skills	SEC	0	0	2	1
23SS553	Presentation Skills	SEC	0	0	2	1
23SS654	Professional Skills	SEC	0	0	2	1
23AR755	Aptitude and Reasoning	SEC	0	0	2	1

LIST OF VALUE ADDED COURSES

Course Code	Course	Category	L	T	P	C
23VACXX	Environment Bioengineering	VAC	2	0	0	2
23VACXX	Indian Constitution and Polity	VAC	2	0	0	2
23VACXX	Sports, Yoga and Fitness	VAC	2	0	0	2

LIST OF MULTIDISCIPLINARY COURSES (HUMANITIES & SOCIAL SCIENCES COURSES) (HSS)

Code	Category	Course	L	T	P	C
23MDCXXX/ 23MDCXXX/ 23MDCXXX/ 23MDCXXX/ 23MDCXXX	MDC-I	Statistical Methods Environment Geoscience & Disaster Management IPR in Business Library Information Science & Media Literacy Management Process & Organizational Behaviour	3	0	0	3
23MDCXXX/ 23MDCXXX/ 23MDCXXX/ 23MDCXXX/ 23MDCXXX	MDC-II	Photonics Chemistry & Society Psychology and Emotional Intelligence Indian Economy Creating an Entrepreneurial Mind	3	0	0	3
23MDCXXX/ 23MDCXXX/ 23MDCXXX/ 23MDCXXX	MDC-III	Life Sciences & Public Health Electoral Literacy in India Personal Financial Planning Interior Design	3	0	0	3

LIST OF PROFESSIONAL ELECTIVE COURSES

Specialization-I

Elective	Course Code	Course	Category	L	T	P	C
I	23CSPE2007	Computer Architecture & Organization	PE	3	1	0	4
II	23CSPE2008/ 23CSPE2118	Analysis and Design of Algorithms /LAB	PE	3	0	2	4
III	23CSPE3003/ 23CSPE3113	Computer Networks / LAB	PE	3	0	2	4
IV / V	23CSPE3027	Operational Research Techniques	PE	3	0	0	3
	23CSPE3035	Distributed Databases	PE	3	0	0	3
	23CSPE3019	Computer Graphics	PE	3	0	0	3
	23CSPE3021	System Modelling and Simulation	PE	3	0	0	3
	23CSPE3023	Digital Image Processing	PE	3	0	0	3
	23CSPE3033	Principles of Programming Languages	PE	3	0	0	3
VI/VII	23CSPE3020	Distributed Operating System	PE	3	1	0	4
	23CSPE3024	Software Project Management	PE	3	1	0	4
	23CSPE3026	Grid Computing	PE	3	1	0	4
	23CSPE3028	Object Oriented Analysis & Design	PE	3	1	0	4
	23CSPE3030	Neural Networks & Fuzzy Logic	PE	3	1	0	4
	23CSPE3032	Cyber Security	PE	3	1	0	4
VIII /IX	23CSPE4019	Network Security & Cryptography	PE	3	1	0	4
	23CSPE4033	Software Testing	PE	3	1	0	4
	23CSPE4023	Wireless Adhoc and Sensor Network	PE	3	1	0	4
	23CSPE4035	Advanced Java Programming	PE	3	1	0	4
	23CSPE4037	NASSCOM Associate Analytics – II	PE	3	1	0	4
	23CSPE4025	Data Warehousing & Data Mining	PE	3	1	0	4
	23CSPE4029	Machine Learning	PE	3	1	0	4

Specialization-II							
Elective	Course Code	Course	Category	L	T	P	C
I	23CSPE2007	Computer Architecture & Organization	PE	3	1	0	4
II	23CSPE2008/ 23CSPE2118	Analysis and Design of Algorithms /LAB	PE	3	0	2	4
III	23CSPE3003/ 23CSPE3113	Computer Networks / LAB	PE	3	0	2	4
IV/V	23CSPE3025	Visual Programming	PE	3	0	0	3
	23CSPE3033	Principles of Programming Languages	PE	3	0	0	3
	23CSPE3039	Block Chain	PE	3	0	0	3
	23CSPE3037	Theory of App Development	PE	3	0	0	3
	23CSPE3041	Data Science	PE	3	0	0	3
	23CSPE3031	Soft Computing		3	0	0	3
VI/VII	23CSPE3030	Neural Networks & Fuzzy Logic	PE	3	1	0	4
	23CSPE3032	Cyber Security	PE	3	1	0	4
	23CSPE3034	Design Thinking	PE	3	1	0	4
	23CSPE3036	Predictive Analytics	PE	3	1	0	4
	23CSPE3038	Business Intelligence	PE	3	1	0	4
	23CSPE3040	Internet of Things	PE	3	1	0	4
VIII/ IX	23CSPE4019	Network Security & Cryptography	PE	3	1	0	4
	23CSPE4027	Mobile Computing	PE	3	1	0	4
	23CSPE4029	Machine Learning	PE	3	1	0	4
	23CSPE4031	Open Source Software	PE	3	1	0	4
	23CSPE4039	NASSCOM Associate Analytics – III	PE	3	1	0	4
	23CSPE4041	Advanced Internet of Things	PE	3	1	0	4
	23CSPE4047	Advanced Block Chain	PE	3	1	0	4

	Specialization-III						
Elective	Course Code	Course	Category	L	T	P	C
I	23CSPE2007	Computer Architecture & Organization	PE	3	1	0	4
II	23CSPE2008/ 23CSPE2118	Analysis and Design of Algorithms /LAB	PE	3	0	2	4
III	23CSPE3003/ 23CSPE3113	Computer Networks / LAB	PE	3	0	2	4
IV/ V	23CSPE3035	Distributed Databases	PE	3	0	0	3
	23CSPE3019	Computer Graphics	PE	3	0	0	3
	23CSPE3023	Digital Image Processing	PE	3	0	0	3
	23CSPE3033	Principles of Programming Languages	PE	3	0	0	3
	23CSPE3039	Block Chain	PE	3	0	0	3
	23CSPE3031	Soft Computing	PE	3	0	0	3
VI/ VII	23CSPE3020	Distributed Operating System	PE	3	1	0	4
	23CSPE3024	Software Project Management	PE	3	1	0	4
	23CSPE3028	Object Oriented Analysis & Design	PE	3	1	0	4
	23CSPE3030	Neural Networks & Fuzzy Logic	PE	3	1	0	4
	23CSPE3034	Design Thinking	PE	3	1	0	4
	23CSPE3038	Business Intelligence	PE	3	1	0	4
VIII /IX	23CSPE4019	Network Security & Cryptography	PE	3	1	0	4
	23CSPE4033	Software Testing	PE	3	1	0	4
	23CSPE4035	Advanced Java Programming	PE	3	1	0	4
	23CSPE4029	Machine Learning	PE	3	1	0	4
	23CSPE4041	Advanced Internet of Things	PE	3	1	0	4
	23CSPE4047	Advanced Block Chain	PE	3	1	0	4