SARALA BIRLA UNIVERSITY RANCHI



Established under the Sarala Birla University Act 2017 Govt. of Jharkhand as per Section 2(f) of UGC Act. 1956

CURRICULUM FOR

B.Tech in Computer Science & Engineering

(Based on AICTE- CBCS)

Effective from 2019-20

DEFINITION OF CREDIT

1 Hr. Lecture (L) per week	1 credit
1 Hr. Tutorial (T) per week	1 credit
1 Hr. Practical (P) per week	0.5 credit
2 Hours Practical (Lab)/week	1 credit
4 Hours Practical (Lab)/week	2 credits

COURSE CODE AND DEFINITION

Course Code	Definition
BSC	Basic Science courses
ESC 9 0	Engineering Science courses
HSMC S	Humanities and Social Sciences including Management courses
PCC-CSE	Professional core courses
PEC-CSE	Professional Elective courses
OEC-CSE	Open Elective Courses
мс	Mandatory Courses
CSE-P1	Project stage-I
CSE-P2	Project stage-II
CSE-P3	Project stage-III

STRUCTURE OF UNDERGRADUATE B.TECH IN CSE

S.No	Category	Credit Breakup
1	Humanities and Social Sciences including Management courses	14
2	Basic Science courses	23
3	Engineering Science courses including workshop,drawing, basics of electrical/mechanical/computer etc	24
4	Professional Core courses	51
5	Professional Elective courses relevant to chosen specialization/branch	20
6	Open subjects – Electives from other technical and /or emerging subjects	11
7	Mandatory Courses[Environmental Sciences]	4
8	Project work, seminar and internship in industry or elsewhere	16
	Total Credits	163

$\textbf{CREDITS DISTRIBUTION} \ (\textbf{SEMESTER-WISE AND COURSE-WISE} \)$

Semester	HSMC	BSC	ESC	PCC	PEC	OEC	MC	Project (CSE- P1+CSE- P2+CSE-P3)	Total Credit Semester- wise
1st		9.5	8						17.5
2nd	3	9.5	8						20.5
3rd	3	4	4	10	ता वि	200			21
4th			4 &	12	Zu	No State	4		20
5th	2		R •	14	3	4	घ		23
6th	4		SAR	10	7		PS/TY	2	23
7th	2		100 m	4 581	नेतृत्व RLA	1/3	95	5	22
8th				ं क	3	4		9	16
Total Credit Course- wise	14	23	24	51	20	11	4	16	
Total Credits								163	

MARKS DISTRIBUTION OF B.TECH IN CSE PROGRAM

				Total	7	Theory	,	Lab			
S. No	Year	Semester	Total Credits	Classes per Week	IA	ESE	TM	IA	ESE	TM	Total Marks
1	1st	I	17.5	22	90	210	300	90	60	150	450
2	181	II	20.5	26	120	280	400	90	60	150	550
3	2nd	III	21	27	150	350	500	120	80	200	700
4	2nd	IV	20	24	180	420	600	90	60	150	750
5	3rd	V	23	28	180	420	600	120	80	200	800
6	Siu	VI	23	30	180	420	600	165	85	250	850
7	4th	VII	22	30	150	350	500	210	90	300	800
8	4U1	VIII	16	26	60	140	200	330	120	450	650
	Tota	l	163	213	1110	2590	3700	1215	635	1850	5550

IA- Internal Assessment, ESE-End Semester Examination

TM- Total Marks



BASIC SCIENCE COURSES

Sl. No.	Course Code	Course Title	Н	ours per w	Credits	Preferred Semester			
			L	T	P				
1	BSC-101	Physics	3	1	0	4	I		
2	BSC-102	Physics Lab	0	0	3	1.5	I		
3	BSC-103	Chemistry	3	1	0	4	II		
4	BSC-104	Chemistry Lab	ral la	13.00	3	1.5	II		
5	BSC-105	Mathematics-I	3	d'a	0	4	I		
6	BSC-106	Mathematics-II	3	1	90	4	II		
7	BSC-107	Mathematics-III	3	1	0 0	4	III		
	Total Credits: 23								
के मेतृत्व UNIVE के कार्या के मास को शर्य									

ENGINEERING SCIENCE COURSES

Sl. No.	Course Code	Course Title	Hours per week			Credits	Preferred Semester
			L	T	P		
1	ESC-101	Basic Electrical & Electronics Engineering	3	1	0	4	I
2	ESC-102	Basic Electrical & Electronics Engineering Lab	0	0	2	1	I
3	ESC-103	Engineering Graphics & Design	1	0	4	3	I
4	ESC-104	Programming for Problem Solving	193	0	0	3	II
5	ESC-105	Programming for Problem Solving Lab	0	0.0	4	2	II
6	ESC-106	Workshop/ Manufacturing Practices	1 2	203	4	3	II
7	ESC-108	Electronics Devices	3	0	0	3	III
8	ESC-109	Electronics Devices Lab	0	0	2	1	III
9	ESC-110	Digital Electronics	1 3	0	0	3	IV
10	ESC-111	Digital Electronics Lab	A bin	0	2	1	IV
		24					

HUMANITIES & SOCIAL SCIENCES INCLUDING MANAGEMENT COURSE

Sl. No.	Course Code	Course Title	Н	ours per w	eek	Credits	Preferred Semester
			L	Т	P		
1	HSMC-101	English	3	0	0	3	II
2	HSMC-102	Technical Communication	T 293	0	0	2	III
3	HSMC-103	Technical Communication Lab	0	1200	2	1	III
4	HSMC-104	Organisational Behaviour	2	0	0	2	VI
5	HSMC-105	French Through Communicative Approach-I	2	0	0	2	V
6	HSMC-106	French Through Communicative Approach-II	नेतृत्व	0	0	2	VI
7	HSMC-107	Professional Practice, Law & Ethics	स्थि के	20	0	2	VII
	Total Credits:						14

MANDATORY COURSES

Sl. No.	Course Code	Course Title	Н	Hours per week			Preferred Semester
			L	Т	P		
1	MC-101	Induction Program	0	0	0	0	I
2	MC-102	Environmental Science	2	0	0	2	IV
3	MC-103	Values & Ethics	ता वि	0	0	2	IV
			4				



PROFESSIONAL CORE COURSES

Sl. No.	Course Code	Course Title	Hrs. /Week L: T: P	Credits	Preferred Semester		
1	PCC-CSE-201	Data Structure & Algorithms	03:00:00	3	III		
2	PCC-CSE-202	Data Structure & Algorithms Lab	00:00:04	2	III		
3	PCC-CSE-203	Object Oriented Programming	03:00:00	3	III		
4	PCC-CSE-204	Object Oriented Programming Lab	00:00:04	2	III		
5	PCC-CSE-205	Discrete Mathematics	03:00:00	3	IV		
6	PCC-CSE-206	Computer Organization & Architecture	03:00:00	3	IV		
7	PCC-CSE-207	Computer Organization & Architecture Lab	00:00:02	1	IV		
8	PCC-CSE-208	Design & Analysis of Algorithms	03:00:00	3	IV		
9	PCC-CSE-209	Design & Analysis of Algorithms Lab	00:00:04	2	IV		
10	PCC-CSE-301	Database Management Systems	03:00:00	3	V		
11	PCC-CSE-302	Database Management Systems Lab	00:00:04	2	V		
12	PCC-CSE-303	Software Engineering	03:00:00	3	V		
13	PCC-CSE-304	Software Engineering Lab	00:00:02	1	V		
14	PCC-CSE-305	Formal Language & Automata Theory	03:00:00	3	V		
15	PCC-CSE-306	IT Workshop (MATLAB)	01:00:02	2	V		
16	PCC-CSE-307	Operating Systems	03:00:00	3	VI		
17	PCC-CSE-308	Operating Systems Lab	00:00:04	2	VI		
18	PCC-CSE-309	Computer Network	03:00:00	3	VI		
19	PCC-CSE-310	Computer Network Lab	00:00:04	2	VI		
20	PCC-CSE-401	Complier Design	03:00:00	3	VII		
21	PCC-CSE-402	Complier Design Lab	00:00:04	2	VII		
	Total Credits:						

PROFESSIONAL ELECTIVE COURSES

Sl. No.	Course Code	Course Title	Hrs./ Week L: T: P	Credits	Preferred Semester
1	PEC-CSE-301	Graph Theory	03:00:00	3	V/VI
2	PEC-CSE-302	Embedded Systems	03:00:00	3	V/VI
3	PEC-CSE-303	Artificial Intelligence	03:00:00	3	V/VI
4	PEC-CSE-304	Internet-of-Things	03:00:00	3	V/VI
5	PEC-CSE-305	Machine Learning	03:00:00	3	V/VI
6	PEC-CSE-306	Cloud Computing	03:00:00	3	V/VI
7	PEC-CSE-307	Cryptography & Network Security	03:00:00	3	V/VI
8	PEC-CSE-308	Cryptography & Network Security Lab	00:00:02	1	V/VI
9	PEC-CSE-309	Introduction to Multimedia	03:00:00	3	V/VI
10	PEC-CSE-310	Introduction to Multimedia Lab	00:00:02	1	V/VI
11	PEC-CSE-311	Computer Graphics	03:00:00	3	V/VI
12	PEC-CSE-312	Computer Graphics Lab	00:00:02	1	V/VI
13	PEC-CSE-313	Web App Development	03:00:00	3	V/VI
14	PEC-CSE-314	Web App Development Lab	00:00:02	1	V/VI
15	PEC-CSE-401	Soft Computing	03:00:00	3	VII/VIII
16	PEC-CSE-402	Cyber Law and Ethics	03:00:00	3	VII/VIII
17	PEC-CSE-403	Data Mining Concepts and Techniques	03:00:00	3	VII/VIII
18	PEC-CSE-404	Natural Language Processing	03:00:00	3	VII/VIII
19	PEC-CSE-405	Bio Inspired Computing	03:00:00	3	VII/VIII
20	PEC-CSE-406	Data Analytics	03:00:00	3	VII/VIII
21	PEC-CSE-407	System Programming	03:00:00	3	VII/VIII
22	PEC-CSE-408	System Programming Lab	00:00:02	1	VII/VIII
23	PEC-CSE-409	Mobile Computing	03:00:00	3	VII/VIII
24	PEC-CSE-410	Mobile Computing Lab	00:00:02	1	VII/VIII
25	PEC-CSE-411	Image Processing	03:00:00	3	VII/VIII
26	PEC-CSE-412	Image Processing Lab	00:00:02	1	VII/VIII
27	PEC-CSE-413	Pattern Recognition	03:00:00	3	VII/VIII
28	PEC-CSE-414	Pattern Recognition Lab	00:00:02	1	VII/VIII

OPEN ELECTIVE COURSES

Sl. No.	Course Code	Course Title	Hrs./ Week L: T: P	Credits	Preferred Semester
1	OEC-ECE-206	Electrical Circuit Analysis	03:00:00	3	V
2	OEC-ECE-207	Electrical Circuit Analysis Lab	00:00:02	1	V
3	OEC-ECE-208	Analog and Digital Communication	03:00:00	3	V
4	OEC-ECE-209	Analog and Digital Communication Lab	00:00:02	1	V
5	OECECE-210	Analog Circuits	03:00:00	3	V
6	OEC-ECE-211	Analog Circuits Lab	00:00:02	1	V
7	OEC-ECE-205	Signals and Systems	03:00:00	3	VII
8	OEC-CSE-307	Control System	03:00:00	3	VII
9	OEC-ECE-212	Miroprocessors and Microcontroller	03:00:00	3	VIII
10	OEC-ECE-213	Miroprocessors and Microcontroller Lab	00:00:02	1	VIII
11	OEC-ECE-303	Digital System Design	03:00:00	3	VIII
12	OEC-ECE-304	Digital System Design Lab	00:00:02	1	VIII
13	OEC-ECE-305	Digital Signal Processing	03:00:00	3	VIII
14	OEC-ECE-306	Digital Signal Processing Lab	00:00:02	1	VIII

PROJECT FOR COMPUTER SCIENCE & ENGINEERING BRANCH

Sl. No.	Course Code	Course Title	Hrs. /Week L: T: P	Credits	Preferred Semester
1	1 CSE-P1 Project Stage-I		00:00:04	2	VI
2	CSE-P2	Project Stage-II	00:00:10	5	VII
3	CSE-P3	Project Stage-III	00:00:18	9	VIII
	Т	otal Credits:	1,419		16



SEMESTER I (FIRST YEAR]

Branch: Computer Science & Engineering

Sl.	Category	Course	Course Title		Hours		Credit		Marl	ks
No.	,	Code		L	T	P		IA	ESE	Total
	_			Theo	ry					
1	Basic Science Course	BSC-101	Physics	3	1	0	4	30	70	100
2	Basic Science Course	BSC-105	Mathematics – I	3	1	0	4	30	70	100
3	3 Science ESC-101 & Electron		Basic Electrical & Electronics Engineering	17 f	7510 F	000	4	30	70	100
	•		2/8	474	T	otal(A)	12	90	210	300
		T h	Practic	cal/Drav	ving/Des	ign	9			
1	Engineering Science Course	ESC-103	Engineering Graphics & Design	1	0	4	3	30	20	50
2	Basic Science Course	BSC-102	Physics Lab	0	0	3	1.5	30	20	50
3	Engineering Science Course	ESC-102	LA Fg	200 P	2	1	30	20	50	
					T	otal(B)	5.5	90	60	150
		Gra	nd Total (A+B)				17.5	180	270	450

L-Lecture, T-Tutorial, P-Practical
IA- Internal Assessment, ESE-End Semester Examination

SEMESTER II (FIRST YEAR)

Branch: Computer Science & Engineering

Sl.	Cotogowy	Course	Course Title	F	Iours		Credit		Mark	xs .
No.	Category	Code	Course Title	L	T	P		IA	ESE	Total
	-	-	Theor	·y	•					
1	Basic Science Course	BSC-103	Chemistry	3	1	0	4	30	70	100
2	Basic Science Course	BSC-106	Mathematics –II	3	1	0	4	30	70	100
3	Engineering Science Course	ESC-104	Programming for Problem Solving	3	0	0	3	30	70	100
4	Humanities and Social Sciences including Management Courses	HSMC-101	English	3 73	000	0	3	30	70	100
		TE TE		15	Tota	l(A)	14	120	280	400
			Practical/Draw	<mark>in</mark> g/D	e <mark>sig</mark> n					
1	Engineering Science Course	ESC-106	Workshop/ Manufacturing Practices	1	0	4	3	30	20	50
2	Basic Science Course	BSC-104	Chemistry Lab	0	0	3	1.5	30	20	50
3	Engineering Science Course	ESC-105	Programming for Problem Solving Lab	0	0	4	2	30	20	50
			' केमस	का	Tota	l(B)	6.5	90	60	150
		Grand Total	(A+B)				20.5	210	340	550

L-Lecture, T-Tutorial, P-Practical
IA- Internal Assessment, ESE-End Semester Examination

SEMESTER III (SECOND YEAR]

Branch: Computer Science & Engineering

Sl. No.	Category	Course Code	Course Title		Hours		Credit		Marks	
				L	T	P		IA	ESE	Total
			Т	heory						
1	Basic Science Course	BSC-107	Mathematics-III	3	1	0	4	30	70	100
2	Engineering Science Course	ESC-108	Electronics Devices	3	0	0	3	30	70	100
3	Humanities and Social Sciences including Management Courses	HSMC-102	Technical Communication	- देवा - देवा	70	0	2	30	70	100
4	Professional Core Course	PCC-CSE-201	Data Structure & Algorithms	3	0	03	3	30	70	100
5	Professional Core Course	PCC-CSE-203	Object Oriented Programming	3	0	0	3	30	70	100
		SP				otal(A)	15	150	350	500
1	Humanities and Social Sciences including Management Courses	HSMC-103	Practical/I Technical Communication Lab	Prawing A L	/Design	2	1	30	20	50
2	Engineering Science Course	ESC-109	Electronics Devices Lab	0	0	2	1	30	20	50
3	Professional Core Course	PCC-CSE-202	Data Structure & Algorithms Lab	0	0	4	2	30	20	50
4	Professional Core Course	PCC-CSE-204	Object Oriented Programming Lab	0	0	4	2	30	20	50
						otal(B)	6	120	80	200
				Gra	nd Total	I (A+B)	21	270	430	700

L-Lecture, T-Tutorial, P-Practical

SEMESTER IV (SECOND YEAR]

Branch: Computer Science & Engineering

Sl.]	Hours		Credit		Marks	
No.	Category	Course Code	Course Title	L	T	P		IA	ESE	Total
			Theory				ı			ı
1	Mandatory Course	MC-101	Environmental Science	2	0	0	2	30	70	100
2	Mandatory Course	MC-103	Values & Ethics	2	0	0	2	30	70	100
3	Engineering Science Course	ESC-110	Digital Electronics	3	0	0	3	30	70	100
4	Professional Core Course	PCC-CSE-205	Discrete Math <mark>ema</mark> tics	3	0	0	3	30	70	100
5	Professional Core Course	PCC-CSE-206	Computer Organization & Architecture	3	0	0	3	30	70	100
6	Professional Core Course	PCC-CSE-208	Design & Analysis of Algorithms	3	0	0	3	30	70	100
		TR TE	2	1	\rightarrow	al(A)	16	180	420	600
		100	Practical/Drawing/	Design	1	1				ı
1	Engineering Science Course	ESC-111	Digital Electronics Lab	0	0	2	1	30	20	50
2	Professional Core Course	PCC-CSE-207	Computer Organization & Architecture Lab	0	0	2	1	30	20	50
3	Professional Core Course	PCC-CSE-209	Design & Analysis of Algorithms Lab	0	0	4	2	30	20	50
		17		191		al(B)	4	90	60	150
			Gr Gr	and T	otal (A	A+B)	20	270	480	750

L-Lecture, T-Tutorial, P-Practical

SEMESTER V (THIRD YEAR]

Branch: Computer Science & Engineering

Sl. No.	Cotogowy	Course Code	Course Title]	Hours	1	Credit		Marks	
S1. NO.	Category	Course Code	Course Title	L	T	P		IA	ESE	Total
			Theory							
1	Humanities and Social Sciences including Management Courses		Foreign Languages-I	2	0	0	2	30	70	100
2	Professional Core Course	PCC-CSE-301	Database Management Systems	3	0	0	3	30	70	100
3	Professional Core Course	PCC-CSE-303	Software Engineering	3300	0	0	3	30	70	100
4	Professional Core Course	PCC-CSE-305	Formal Language & Automata Theory	3	0	0	3	30	70	100
5	Professional Elective Course	S	Professional Elective-	3	0	0	3	30	70	100
6	Open Elective Course	PRY	Open Elective-1	3	0	0	3	30	70	100
		9 1	न गतृत्व		Tot	tal(A)	17	180	420	600
		93	Practical/Drawing	/Desig	n	-				
1	Professional Core Course	PCC-CSE-302	Database Management Systems Lab	0	0	4	2	30	20	50
2	Professional Core Course	PCC-CSE-304	Software Engineering Lab	0	0	2	1	30	20	50
3	Professional Core Course	PCC-CSE-306	IT Workshop (MATLAB)	1	0	2	2	30	20	50
4	Open Elective Course		Open Elective-1 Lab	0	0	2	1	30	20	50
					Tot	tal(B)	6	120	80	200
			G	rand T	Total (A+B)	23	300	500	800

L-Lecture, T-Tutorial, P-Practical

SEMESTER VI (THIRD YEAR]

Branch: Computer Science & Engineering

Sl.	Category	Course Code	Course Title		Hours		Credit		Mark	S
No.				L	T	P		IA	ESE	Total
			Theory							
1	Humanities and Social Sciences including Management Courses	HSMC-104	Organizational Behaviour	2	0	0	2	30	70	100
2	Humanities and Social Sciences including Management Courses		Foreign Languages-	2	0	0	2	30	70	100
3	Professional Core Course	PCC-CSE-307	Operating Systems	3	0	0	3	30	70	100
4	Professional Core Course	PCC-CSE-309	Computer Network	3 9	0	0	3	30	70	100
5	Professional Elective Course	R B	Professional Elective-2	3	0	0	3	30	70	100
6	Professional Elective Course		Professional Elective-3	3	0	0	3	30	70	100
	3	0)		7/	To	tal(A)	16	180	420	600
			Practical/Drawing	/Design	n 💪					
1	Professional Core Course	PCC-CSE-308	Operating Systems Lab	0	0	4	2	30	20	50
2	Professional Core Course	PCC-CSE-310	Computer Network Lab	0	0	4	2	30	20	50
3	Professional Elective Course		Professional Elective-2 Lab	0	0	2	1	30	20	50
4	Project Stage-I	CSE-P1	Mini Project/ Computer Science and Engineering Workshop	0	0	4	2	75	25	100
		Q 1=	(1 (To	tal(B)	7	165	85	250
		Grand To	otal (A+B)				23	345	505	850

L-Lecture, T-Tutorial, P-Practical

SEMESTER VII (FOURTH YEAR]

Branch: Computer Science & Engineering

Sl. No.	Category	Course	Course Title		Hours		Credit		Mar	ks
51. 110.	Category	Code	Course Title	L	T	P		IA	ESE	Total
			The	ory						
1	Humanities and Social Sciences including Management Courses	HSMC-107	Professional Practice, Law & Ethics	2	0	0	2	30	70	100
2	Professional Core Course	PCC-CSE- 401	Compiler Design	3	0	0	3	30	70	100
3	Professional Elective Course		Professional Elective-4	3	300	0	3	30	70	100
4	Professional Elective Course	A TO	Professional Elective-5	3	0	30	3	30	70	100
5	Open Elective Course		Open Elective-2	3	0	0	3	30	70	100
		S			To	tal(A)	14	150	350	500
	,	W Z	Practical/Dra	wing/I	Design					
1	Professional Core Course	PCC-CSE- 402	Compiler Design Lab	0	0	4	2	30	20	50
2	Professional Elective Course	67	Professional Elective-4 Lab	30	0	2	1	30	20	50
3	Project Stage-II	II CSE-P2 Project Work 0 0 10						150	50	200
					To	tal(B)	8	210	90	300
				Grand	l Total	(A+B)	22	360	440	800

 $\pmb{L\text{-}Lecture, T\text{-}Tutorial, P\text{-}Practical}\\$

SEMESTER VIII (FOURTH YEAR]

Branch: Computer Science & Engineering

Sl. No.	Category	Course	Course Title		Hours		Credit		Mark	KS
51. 140.	Category	Code	Course Title	L	T	P		IA	ESE	Total
1 1	Professional Elective Course		Professional Elective-6	3	0	0	3	30	70	100
2	Open Elective Course		Open Elective-3	3	0	0	3	30	70	100
					Tota	al(A)	6	60	140	200
			Practical/Dra	wing/	Design	1	_			
1	Open Elective Course		Open Elective-3 Lab	0	0	2	1	30	20	50
2	Project Stage-III	CSE-P3	Project Work & Dissertation	0	0	18	9	300	100	400
			al(B)	10	330	120	450			
	Grand Total (A+B)							390	260	650

L-Lecture, T-Tutorial, P-Practical