

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 UGC & AICTE- CBCS) (2019-23)

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	Engineering Science courses
HSMC	Humanities and Social Sciences including Management courses
PCC-CSE	Professional core courses
PEC-CSE	Professional Elective courses
OEC-CSE	Open Elective Courses
MC	Mandatory Courses
CSE-P1	Project stage-I
CSE-P2	Project stage-II
CSE-P3	Project stage-III

STRUCTURE OF UNDERGRADUATE B.TECH IN CSE PROGRAM

S.No		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.	28
4	Professional Core Courses	44
5	Professional Elective Courses relevant to chosen specialization/branch	25
6	Open subjects – Electives from other technical and /or emerging subjects	11
7	Project work, seminar and internship in industry or elsewhere	16
8	Mandatory Courses[Environmental Sciences]	4
	Total Credits	165

CREDITS DISTRIBUTION (SEMESTER-WISE AND COURSE-WISE)

Semester	HSMC	BSC	ESC	PCC	PEC	OEC	PROJ	MC	Total Credit Semester-wise
1st	0	9.5	8	0	0	0	0	0	17.5
2nd	3	9.5	8	0	0	0	0	0	20.5
3rd	3	4	8	8	0	0	0	0	23
4th	0	0	4	11	0	0	0	4	19
5th	2	0	0	17	3	0	0	0	22
6th	4	0	0	8	3	3	2	0	20
7th	2	0	0	0	10	4	5	0	21
8th	0	0	0	0	9	4	9	0	22
Total Credit Course-wise	14	23	28	44	25	11	16	4	165
Total Credit									165

HUMANITIES & SOCIAL SCIENCES INCLUDING MANAGEMENT COURSE

Sl. No.	Course Code	Course Title	Hours per week			Credits	Preferred Semester
			L	T	P		
1	HSMC-101	English	3	0	0	3	II
2	HSMC-102	Technical Communication	2	0	0	2	III
3	HSMC-103	Technical Communication Lab	0	0	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	2	0	0	2	VI
7	HSMC-107	Professional Practice, Law & Ethics	2	0	0	2	VII
Total Credits:						14	

BASIC SCIENCE COURSES

Sl. No.	Course Code	Course Title	Hours per week			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	0	0	3	1.5	II
5	BSC-105	Mathematics-I	3	1	0	4	I
6	BSC-106	Mathematics-II	3	1	0	4	II
7	BSC-107	Mathematics-III	3	1	0	4	III
Total Credits:						23	

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	3	0	0	3	II
5	ESC-105	Programming for Problem Solving Lab	0	0	4	2	II
6	ESC-106	Workshop/ Manufacturing Practices	1	0	4	3	II
7	ESC-107	Engineering Mechanics	3	1	0	4	III
8	ESC-108	Electronic Devices	3	0	0	3	III
9	ESC-109	Electronic Devices Lab	0	0	2	1	III
10	ESC-110	Digital Electronics	3	0	0	3	IV
11	ESC-111	Digital Electronics Lab	0	0	2	1	IV
Total						28	

MANDATORY COURSES

Sl. No.	Course Code	Course Title	Hours per week			Credits	Preferred Semester
			L	T	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	2	0	0	2	IV
Total Credits:						4	

Professional Core Courses (Sem III & IV)

Branch: Computer Science & Engineering

Sl. No.	Course Code	Course Title	Hrs./Week L:T:P	Credits	Preferred Semester
1	PCC-CSE-201	Data Structure & Algorithms	3:0:0	3	III
2	PCC-CSE-202	Data Structure & Algorithms Lab	0:0:2	1	III
3	PCC-CSE-203	Object Oriented Programming	3:0:0	3	III
4	PCC-CSE-204	Object Oriented Programming Lab	0:0:2	1	III
5	PCC-CSE-205	Discrete Mathematics	3:0:0	3	IV
6	PCC-CSE-206	Computer Organization & Architecture	3:0:0	3	IV
7	PCC-CSE-207	Computer Organization & Architecture Lab	0:0:2	1	IV
8	PCC-CSE-208	Design & Analysis of Algorithms	3:0:0	3	IV
9	PCC-CSE-209	Design & Analysis of Algorithms Lab	0:0:2	1	IV
Total Credits:				19	

Professional Core Courses (Sem V & VI)

10	PCC-CSE-301	Database Management Systems	3:0:0	3	V
11	PCC-CSE-302	Database Management Systems Lab	0:0:2	1	V
12	PCC-CSE-303	Software Engineering	3:0:0	3	V
13	PCC-CSE-304	Software Engineering Lab	0:0:2	1	V
14	PCC-CSE-305	Formal Language & Automata Theory	3:0:0	3	V
15	PCC-CSE-306	IT Workshop (MATLAB)	1:0:2	2	V
16	PCC-CSE-307	Operating Systems	3:0:0	3	VI
17	PCC-CSE-308	Operating Systems Lab	0:0:2	1	VI
18	PCC-CSE-309	Computer Networks	3:0:0	3	VI
19	PCC-CSE-310	Computer Networks Lab	0:0:2	1	VI
20	PCC-CSE-311	Compiler Design	3:0:0	3	VII
21	PCC-CSE-312	Compiler Design Lab	0:0:2	1	VII
Total Credits:				25	

PROFESSIONAL ELECTIVE COURSES (Sem V & VI)

Branch: Computer Science & Engineering

Sl. No.	Course Code	Course Title	Hrs./ Week L: T: P	Credits	Preferred Semester
1	PEC-CSE-301	Graph Theory	3:0:0	3	V/VI
2	PEC-CSE-302	Embedded Systems	3:0:0	3	V/VI
3	PEC-CSE-303	Artificial Intelligence	3:0:0	3	V/VI
4	PEC-CSE-304	Internet of Things	3:0:0	3	V/VI
5	PEC-CSE-305	Machine Learning	3:0:0	3	VI/V
6	PEC-CSE-306	Cryptography & Networks Security	3:0:0	3	VI/V
7	PEC-CSE-307	Cyber Law & Ethics	3:0:0	3	V/VI
8	PEC-CSE-308	Bio Inspired Computing	3:0:0	3	V/VI

PROFESSIONAL ELECTIVE COURSES(Sem VII & VIII)

Branch: Computer Science & Engineering

Sl. No.	Course Code	Course Title	Hrs./ Week L: T: P	Credits	Preferred Semester
1	PEC-CSE-401	Web Technology	3:0:0	3	VII/VIII
2	PEC-CSE-402	Web Technology Lab	0:0:2	1	VII/VIII
3	PEC-CSE-403	Data Mining Concepts & Techniques	3:0:0	3	VII/VIII
4	PEC-CSE-404	Natural Language Processing	3:0:0	3	VII/VIII
5	PEC-CSE-405	Mobile Computing	3:0:0	3	VII/VIII
6	PEC-CSE-406	Deep Learning	3:0:0	3	VII/VIII
7	PEC-CSE-407	Python GUI Programming	1:0:2	2	VII/VIII
8	PEC-CSE-408	Information Security	3:0:0	3	VII/VIII
9	PEC-CSE-409	Pattern Recognition	3:0:0	3	VII/VIII
10	PEC-CSE-410	Pattern Recognition Lab	0:0:2	1	VII/VIII
11	PEC-CSE-411	Digital Image Processing	3:0:0	3	VII/VIII
12	PEC-CSE-412	Digital Image Processing Lab	0:0:2	1	VII/VIII

OPEN ELECTIVE COURSES

Branch: Computer Science & Engineering

Sl. No.	Course Code	Course Title	Hrs./ Week L: T: P	Credits
1	OEC-ECE-205	Signal & System	3:0:0	3
2	OEC-EEE-401	Miroprocessors & Microcontroller	3:0:0	3
3	OEC-EEE-402	Miroprocessors & Microcontroller Lab	0:0:2	1
4	OEC-ECE-404	Fiber Optics Communication	3:0:0	3
5	OEC-ECE-405	Fiber Optics Communication Lab	0:0:2	1
				11

PROJECT FOR COMPUTER SCIENCE & ENGINEERING BRANCH

Branch: Computer Science & Engineering

Sl. No.	Course Code	Course Title	Hrs. /Week L: T: P	Credits	Preferred Semester
1	CSE-P1	Project Stage-I (Mini Project/ Training)	0:0:4	2	VI
2	CSE-P2	Project Stage-II (Minor Project)	0:0:10	5	VII
3	CSE-P3	Project Stage-III (Major Project Work & Dissertation)	0:0:18	9	VIII
Total Credits:				16	

COURSE STRUCTURE

SEMESTER I (FIRST YEAR)

Branch: Computer Science & Engineering

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks			
				L	T	P		IA	ESE	Total	
Theory											
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	Engineering Science Course	ESC-101	Basic Electrical & Electronics Engineering	3	1	0	4	30	70	100	
Total(A)							12	90	210	300	
Practical/Drawing/Design											
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	Basic Electrical & Electronics Engineering Lab	0	0	2	1	30	20	50	
Total(B)							5.5	90	60	150	
Grand Total (A+B)							17.5	180	270	450	
L-Lecture, T-Tutorial, P-Practical											
IA- Internal Assessment, ESE-End Semester Examination											

COURSE STRUCTURE

SEMESTER II (FIRST YEAR)

Branch: Computer Science & Engineering

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
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 Course	HSMC-101	English	3	0	0	3	30	70	100
Total(A)							14	120	280	400
Practical/Drawing/Design										
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
Total(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										

COURSE STRUCTURE

SEMESTER III (SECOND YEAR)

Branch: Computer Science & Engineering

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Basic Science Course	BSC-107	Mathematics-III	3	1	0	4	30	70	100
2	Engineering Science Course	ESC-108	Electronic Devices	3	0	0	3	30	70	100
3	Humanities and Social Sciences including Management Course	HSMC-102	Technical Communication	2	0	0	2	30	70	100
4	Professional Core Course	PCC-CSE-201	Data Structure & Algorithms	3	0	0	3	30	70	100
5	Professional Core Course	PCC-CSE-203	Object Oriented Programming	3	0	0	3	30	70	100
6	Engineering Science Course	ESC-107	Engineering Mechanics	3	1	0	4	30	70	100
Total(A)							19	180	420	600
Practical/Drawing/Design										
1	Humanities and Social Sciences including Management Course	HSMC-103	Technical Communication Lab	0	0	2	1	30	20	50
2	Engineering Science Course	ESC-109	Electronic Devices Lab	0	0	2	1	30	20	50
3	Professional Core Course	PCC-CSE-202	Data Structure & Algorithms Lab	0	0	2	1	30	20	50
4	Professional Core Course	PCC-CSE-204	Object Oriented Programming Lab	0	0	2	1	30	20	50
Total(B)							4	120	80	200
Grand Total (A+B)							23	300	500	800
L-Lecture, T-Tutorial, P-Practical IA- Internal Assessment, ESE-End Semester Examination										

COURSE STRUCTURE

SEMESTER IV (SECOND YEAR)

Branch: Computer Science & Engineering

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Mandatory Course	MC-102	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 Mathematics	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
Total(A)							16	180	420	600
Practical/Drawing/Design										
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	2	1	30	20	50
Total(B)							3	90	60	150
Grand Total (A+B)							19	270	480	750
L-Lecture, T-Tutorial, P-Practical										
IA- Internal Assessment, ESE-End Semester Examination										

COURSE STRUCTURE

SEMESTER V (THIRD YEAR)

Branch: Computer Science & Engineering

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Humanities & Social Sciences including Management Course	HSMC-105	French Through Communicative Approach-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	3	0	0	3	30	70	100
4	Professional Core Course	PCC-CSE-305	Formal Languages & Automata Theory	3	0	0	3	30	70	100
5	Professional Core Course	PCC-CSE-307	Operating Systems	3	0	0	3	30	70	100
6	Professional Elective Course		Professional Elective Course-I	3	0	0	3	30	70	100
Total(A)							17	180	420	600
Practical/Drawing/Design										
1	Professional Core Subject	PCC-CSE-302	Database Management Systems Lab	0	0	2	1	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	Professional Core Course	PCC-CSE-308	Operating Systems Lab	0	0	2	1	30	20	50
Total(B)							5	120	80	200
Grand Total (A+B)							22	300	500	800
L-Lecture, T-Tutorial, P-Practical IA- Internal Assessment, ESE-End Semester Examination										

COURSE STRUCTURE

SEMESTER VI (THIRD YEAR)

Branch: Computer Science & Engineering

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Humanities and Social Sciences including Management Course	HSMC-104	Organizational Behaviour	2	0	0	2	30	70	100
2	Humanities and Social Sciences including Management Course	HSMC-106	French Through Communicative Approach-II	2	0	0	2	30	70	100
3	Professional Core Course	PCC-CSE-309	Computer Networks	3	0	0	3	30	70	100
4	Professional Core Course	PCC-CSE-311	Compiler Design	3	0	0	3	30	70	100
5	Professional Elective Course		Professional Elective Course-II	3	0	0	3	30	70	100
6	Open Eletive Course		Open Eletive Course-I	3	0	0	3	30	70	100
Total(A)							16	180	420	600
Practical/Drawing/Design										
1	Professional Core Course	PCC-CSE-310	Computer Networks Lab	0	0	2	1	30	20	50
2	Professional Core Course	PCC-CSE-312	Complier Design Lab	0	0	2	1	30	20	50
3	Project Work	CSE-P1	Project Stage-I (Mini Project / Training)	0	0	4	2	75	25	100
Total(B)							4	135	65	200
Grand Total (A+B)							20	315	485	800
L-Lecture, T-Tutorial, P-Practical										
IA- Internal Assessment, ESE-End Semester Examination										

COURSE STRUCTURE

SEMESTER VII (FOURTH YEAR)

Branch: Computer Science & Engineering

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Humanities and Social Sciences including Management Course	HSMC-107	Professional Practice, Law & Ethics	2	0	0	2	30	70	100
2	Professional Elective Course		Professional Elective Course-II	3	0	0	3	30	70	100
3	Professional Elective Course		Professional Elective Course-III	3	0	0	3	30	70	100
4	Open Eletive Course		Open Eletive Course-II	3	0	0	3	30	70	100
Total(A)							11	150	350	500
Practical/Drawing/Design										
1	Professional Elective Course	PEC-CSE-402	Web Technology Lab	0	0	2	1	30	20	50
2	Professional Elective Course	PEC-CSE-412	Degital Image Processing Lab	0	0	2	1	30	20	50
3	Professional Elective Course	PEC-CSE-407	Python GUI Programming	1	0	2	2	30	70	100
4	Open Eletive Course		Open Eletive Course (Lab)-II	0	0	2	1	30	20	50
5	Project Work	CSE-P2	Project Stage-II (Minor Project)	0	0	10	5	75	25	100
Total(B)							10	195	155	350
Grand Total (A+B)							21	345	505	850

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination

COURSE STRUCTURE

SEMESTER VIII (FOURTH YEAR)

Branch: Computer Science & Engineering

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Professional Elective Course		Professional Elective Course-IV	3	0	0	3	30	70	100
2	Professional Elective Course		Professional Elective Course-V	3	0	0	3	30	70	100
3	Professional Elective Course		Professional Elective Course-VI	3	0	0	3	30	70	100
4	Open Eletive Course		Open Eletive Course-III	3	0	0	3	30	70	100
Total(A)							12	120	280	400
Practical/Drawing/Design										
1	Open Eletive Course		Open Eletive Course (Lab)-II	0	0	2	1	30	20	50
2	Project Work	CSE-P3	Project Stage-III (Major Project Work & Dissertation)	0	0	18	9	75	25	100
Total(B)							10	330	120	150
Grand Total (A+B)							22	450	400	550
L-Lecture, T-Tutorial, P-Practical IA- Internal Assessment, ESE-End Semester Examination										