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
Electronics & Communication Engineering

(Based on UGC & 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 Hr. Practical (P) Per Week	1 Credit

Course Code Definitions

Course code	Definitions
BSC	Basic Science Course
ESC	Engineering Science Course
HSMC	Humanities and Social Sciences including Management Course
MC	Mandatory Course
PCC-ECE	Professional Core Course
PEC-ECE	Professional Electives Course
OEC	Open Electives Course
ECE-P1	Project Stage-I
ECE-P2	Project Stage-II
ECE-P3	Project Stage-III

Structure of Electronics & Communication Engineering (B.Tech)

(Breakup of Credits)

Sl. No.	Category	Breakup of Credits
1	Humanities and Social Sciences including Management course	14
2	Basic Science course	23
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc	20
4	Professional core course	49
5	Professional Elective courses relevant to chosen specialization/branch	24
6	Open subjects – Electives from other technical and /or emerging subjects	13
7	Project work, seminar and internship in industry orelsewhere	16
8	Mandatory Course [Environmental Science, Induction Program, Indian Constitution, Essence of Indian Traditional Knowledge]	4
Total:		**163**

CREDITS DISTRIBUTION (SEMESTER-WISE AND COURSE-WISE)

Semester	HSMC	BSC	ESC	PCC	PEC	OEC	PROJECT	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	4	12	0	0	0	0	23
4th	0	0	0	15	0	0	0	4	19
5th	2	0	0	15	0	3	0	0	20
6th	4	0	0	7	3	3	2	0	19
7th	2	0	0	0	7	7	5	0	21
8th	0	0	0	0	14	0	9	0	23
Total Credit Course-wise	14	23	20	49	24	13	16	4	163
Total Credit									163

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
					Total Credits:	**20**	

Total Credits: **35**

Professional Core Courses (Sem III & IV)

Branch: Electronics & Communication Engineering (B.Tech)

Sl. No.	Course Code	Course Title	Hrs. /Week L: T: P	Credits	Preferred Semester
1	PCC-ECE-201	Electronic Devices	3:0:0	3	III/IV
2	PCC-ECE-202	Electronic Devices Lab	0:0:2	1	III/IV
3	PCC-ECE-203	Digital Electronics	3:0:0	3	III/IV
4	PCC-ECE-204	Digital Electronics Lab	0:0:2	1	III/IV
5	PCC-ECE-205	Signal & System	3:0:0	3	III/IV
6	PCC-ECE-206	Electrical Circuit Analysis	3:0:0	3	III/IV
7	PCC-ECE-207	Electrical Circuit Analysis Lab	0:0:2	1	III/IV
8	PCC-ECE-208	Communication System-I	3:0:0	3	III/IV
9	PCC-ECE-209	Communication System Lab-I	0:0:2	1	III/IV
10	PCC-ECE-210	Analog Circuits	3:0:0	3	III/IV
11	PCC-ECE-211	Analog Circuits Lab	0:0:2	1	III/IV
12	PCC-ECE-212	Microprocessors & Microcontroller	3:0:0	3	III/IV
13	PCC-ECE-213	Microprocessors & Microcontroller Lab	0:0:2	1	III/IV
			Total Credits:	**27**	

Professional Core Courses (Sem V & VI)

Branch: Electronics & Communication Engineering (B.Tech)

Sl. No.	Course Code	Course Title	Hrs. /Week L: T: P	Credits	Preferred Semester
1	PCC-ECE-301	Transmission Lines & Electromagnetic Waves	3:0:0	3	V/VI
2	PCC-ECE-302	Communication System-II	3:0:0	3	V/VI
3	PCC-ECE-303	Communication System Lab-II	0:0:2	1	V/VI
4	PCC-ECE-304	Digital System Design	3:0:0	3	V/VI
5	PCC-ECE-305	Digital System Design Lab	0:0:2	1	V/VI
6	PCC-ECE-306	Digital Signal Processing	3:0:0	3	V/VI
7	PCC-ECE-307	Digital Signal Processing Lab	0:0:2	1	V/VI
8	PCC-ECE-308	Control System	3:0:0	3	V/VI
9	PCC-ECE-309	Computer Networks	3:0:0	3	V/VI
10	PCC-ECE-310	Computer Networks Lab	0:0:2	1	V/VI
			Total Credits:	**22**	

Professional Elective Courses (Sem V & VI)

Branch: Electronics & Communication Engineering (B.Tech)

Sl. No.	Course Code	Course Title	Hrs./ Week L: T: P	Credits	Preferred Semester
1	PEC-ECE-301	Information Theory & Coding	3:0:0	3	V/VI
2	PEC-ECE-302	Introduction to MEMS	3:0:0	3	V/VI
3	PEC-ECE-303	VLSI Design	3:0:0	3	V/VI
4	PEC-ECE-304	Nano Electronics	3:0:0	3	V/VI

Professional Elective Courses (Sem VII & VIII)

Branch: Electronics & Communication Engineering (B.Tech)

Sl. No.	Course Code	Course Title	Hrs./ Week L: T: P	Credits	Preferred Semester
1	PEC-ECE-401	Microwave Theory & Techniques	3:0:0	3	VII/VIII
2	PEC-ECE-402	Microwave Theory & Techniques Lab	0:0:2	1	VII/VIII
3	PEC-ECE-403	Adaptive Signal Processing	3:0:0	3	VII/VIII
4	PEC-ECE-404	Satellite Communication	3:0:0	3	VII/VIII
5	PEC-ECE-405	Fiber Optic Communications	3:0:0	3	VII/VIII
6	PEC-ECE-406	Fiber Optic Communications Lab	0:0:2	1	VII/VIII
7	PEC-ECE-407	Antenna & Wave Propagation	3:0:0	3	VII/VIII
8	PEC-ECE-408	Antenna Measurements Lab	0:0:2	1	VII/VIII
9	PEC-ECE-409	Mobile Communication & Networks	3:0:0	3	VII/VIII
10	PEC-ECE-410	Mixed Signal Design	3:0:0	3	VII/VIII
11	PEC-ECE-411	Wireless Sensor Networks	3:0:0	3	VII/VIII
12	PEC-ECE-412	High Speed Electronics	3:0:0	3	VII/VIII
13	PEC-ECE-413	Wavelets	3:0:0	3	VII/VIII
14	PEC-ECE-414	Embedded Systems	3:0:0	3	VII/VIII
15	PEC-ECE-415	Error Correcting Codes	3:0:0	3	VII/VIII
16	PEC-ECE-416	Computer Architecture	3:0:0	3	VII/VIII

Open Elective Course

Branch: Electronics & Communication Engineering (B.Tech)

Sl. No.	Course Code	Course Title	Hrs./ Week L: T: P	Credits
1	OEC-CSE-303	Artificial Intelligence	3:0:0	3
2	OEC-CSE-305	Machine Learning	3:0:0	3
3	OEC-CSE-410	Image Processing	3:0:0	3
4	OEC-CSE-411	Image Processing Lab	0:0:2	1
5	OEC-ME-408	Wind & Solar Energy Systems	3:0:0	3

Project Work

Branch: Electronics & Communication Engineering (B.Tech)

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

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**	

COURSE STRUCTURE

SEMESTER-I (FIRST YEAR)

Branch: Electronics & Communication 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: Electronics & Communication 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: Electronics & Communication 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	Professional Core Course	PCC-ECE-203	Digital Electronics	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-ECE-201	Electronic Devices	3	0	0	3	30	70	100
5	Engineering Science Course	ESC-107	Engineering Mechanics	3	1	0	4	30	70	100
6	Professional Core Course	PCC-ECE-206	Electrical Circuit Analysis	3	0	0	3	30	70	100
						Total(A)	**19**	**180**	**420**	**600**
Practical/Drawing/Design										
1	Professional Core Course	PCC-ECE-204	Digital Electronics Lab	0	0	2	1	30	20	50
2	Professional Core Course	PCC-ECE-202	Electronic Devices Lab	0	0	2	1	30	20	50
3	Humanities and Social Sciences including Management Course	HSMC-103	Technical Communication Lab	0	0	2	1	30	20	50
4	Professional Core Course	PCC-ECE-207	Electrical Circuit Analysis 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: Electronics & Communication Engineering

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Professional Core Course	PCC-ECE-210	Analog Circuits	3	0	0	3	30	70	100
2	Professional Core Course	PCC-ECE-205	Signal & System	3	0	0	3	30	70	100
3	Professional Core Course	PCC-ECE-208	Communication System-I	3	0	0	3	30	70	100
4	Professional Core Course	PCC-ECE-212	Microprocessors & Microcontroller	3	0	0	3	30	70	100
5	Mandatory Course	MC-102	Environmental Science	2	0	0	2	30	70	100
6	Mandatory Course	MC-103	Values & Ethics	2	0	0	2	30	70	100
						Total(A)	**16**	**180**	**420**	**600**
Practical/Drawing/Design										
1	Professional Core Course	PCC-ECE-211	Analog Circuits Lab	0	0	2	1	30	20	50
2	Professional Core Course	PCC-ECE-209	Communication System Lab-I	0	0	2	1	30	20	50
3	Professional Core Course	PCC-ECE-213	Microprocessors & Microcontroller 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: Electronics & Communication Engineering

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Professional Core Course	PCC-ECE-301	Transmission Lines & Electromagnetic Waves	3	0	0	3	30	70	100
2	Professional Core Course	PCC-ECE-302	Communication System-II	3	0	0	3	30	70	100
3	Professional Core Course	PCC-ECE-304	Digital System Design	3	0	0	3	30	70	100
4	Professional Core Course	PCC-ECE-306	Digital Signal Processing	3	0	0	3	30	70	100
5	Open Elective Course	OEC-CSE-303	Artificial Intelligence	3	0	0	3	30	70	100
6	Humanities and Social Sciences including Management Course	HSMC-105	French Through Communicative Approach-I	2	0	0	2	30	70	100
						Total(A)	**17**	**180**	**420**	**600**
Practical/Drawing/Design										
1	Professional Core Course	PCC-ECE-305	Digital System Design Lab	0	0	2	1	30	20	50
2	Professional Core Course	PCC-ECE-303	Communication System-II	0	0	2	1	30	20	50
3	Professional Core Course	PCC-ECE-307	Digital Signal Processing Lab	0	0	2	1	30	20	50
						Total(B)	**3**	**90**	**60**	**150**
Grand Total (A+B)							**20**	**270**	**480**	**750**

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination

COURSE STRUCTURE

SEMESTER-VI (THIRD YEAR)

Branch: Electronics & Communication Engineering

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Professional Core Course	PCC-ECE-308	Control System	3	0	0	3	30	70	100
2	Professional Core Course	PCC-ECE-309	Computer Networks	3	0	0	3	30	70	100
3	Professional Elective Course	PEC-ECE-303	VLSI Design	3	0	0	3	30	70	100
4	Open Elective Course	OEC-CSE-305	Machine Learning	3	0	0	3	30	70	100
5	Humanities and Social Sciences including Management Course	HSMC-104	Organisational Behaviour	2	0	0	2	30	70	100
6	Humanities and Social Sciences including Management Course	HSMC-106	French Through Communicative Approach-II	2	0	0	2	30	70	100
						Total(A)	**16**	**180**	**420**	**600**
Practical/Drawing/Design										
1	Professional Core Course	PCC-ECE-310	Computer Networks Lab	0	0	2	1	30	20	50
2	Project Work	ECE-P1	Project Stage-I (Mini Project/ Industrial Training)	0	0	4	2	75	25	100
						Total(B)	**3**	**105**	**45**	**150**
Grand Total (A+B)							**19**	**285**	**465**	**750**

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination

COURSE STRUCTURE

SEMESTER-VII (FOURTH YEAR)

Branch: Electronics & Communication Engineering

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Professional Elective Course	PEC-ECE-401	Microwave Theory & Techniques	3	0	0	3	30	70	100
2	Professional Elective Course	PEC-ECE-404	Satellite Communication	3	0	0	3	30	70	100
3	Open Elective Course	OEC-ME-408	Wind & Solar Energy Systems	3	0	0	3	30	70	100
4	Humanities and Social Sciences including Management Course	HSMC-107	Professional Practice, Law & Ethics	2	0	0	2	30	70	100
5	Open Elective Course	OEC-CSE-410	Digital Image Processing	3	0	0	3	30	70	100
						Total(A)	**14**	**150**	**350**	**500**
Practical/Drawing/Design										
1	Professional Elective Course	PEC-ECE-402	Microwave Theory & Techniques Lab	0	0	2	1	30	20	50
2	Open Elective Course	OEC-CSE-411	Digital Image Processing Lab	0	0	2	1	30	20	50
3	Project Work	ECE-P2	Project Stage-II (Minor Project)	0	0	10	5	150	50	200
						Total(B)	**7**	**210**	**90**	**300**
Grand Total (A+B)							**21**	**360**	**440**	**800**

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination

COURSE STRUCTURE

SEMESTER-VIII (FOURTH YEAR)

Branch: Electronics & Communication Engineering

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Professional Elective Course	PEC-ECE-407	Antenna & Wave Propagation	3	0	0	3	30	70	100
2	Professional Elective Course	PEC-ECE-408	Mobile Communication & Networks	3	0	0	3	30	70	100
3	Professional Elective Course	PEC-ECE-404	Satellite Communication	3	0	0	3	30	70	100
4	Professional Elective Course	PEC-ECE-405	Fiber Optic Communications	3	0	0	3	30	70	100
						Total(A)	**12**	**120**	**280**	**400**
Practical/Drawing/Design										
1	Professional Elective Course	PEC-ECE-408	Antenna Measurements Lab	0	0	2	1	30	20	50
2	Professional Elective Course	PEC-ECE-406	Fiber Optic Communications Lab	0	0	2	1	30	20	50
3	Project Work	ECE-P3	Project Stage-III (Major Project Work & Dissertation)	0	0	18	9	300	100	400
						Total(B)	**11**	**360**	**140**	**500**
Grand Total (A+B)							**23**	**480**	**420**	**900**

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination