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
Electrical & Electronics 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 Hr. Practical (P) Per Week	1 Credit

Course Code Definitions

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

Structure of Electrical & Electronics Engineering

(Breakup of Credits)

Sl. No.	Category	Breakup of Credits (Total 161)
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	20
4	Professional core courses	51
5	Professional Elective courses relevant to chosen specialization/branch	18
6	Open subjects – Electives from other technical and /or emerging subjects	18
7	Project work, seminar and internship in industry or elsewhere	13
8	Mandatory Courses [Environmental Sciences, Induction Program, Indian Constitution, Essence of Indian Traditional Knowledge]	4
	Total Credits:	**161**

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	IV
					Total Credits:		**20**

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

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: Electrical & Electronics Engineering (B.Tech)

Sl. No.	Course Code	Course Title	Hrs. /Week L: T: P	Credits	Preferred Semester
1	PCC-EEE201	Electrical Circuit Analysis	03:00:00	3	III/IV
2	PCC-EEE202	Electrical Circuit Analysis Lab	00:00:02	1	III/IV
3	PCC-EEE203	Electronics Devices	03:00:00	3	III/IV
4	PCC-EEE204	Electronics Devices Lab	00:00:02	1	III/IV
5	PCC-EEE205	Analog Electronics	03:00:00	3	III/IV
6	PCC-EEE206	Analog Electronics Lab	00:00:02	1	III/IV
7	PCC-EEE207	Electrical Machines – I	03:00:00	3	III/IV
8	PCC-EEE208	Electrical Machines Lab - I	00:00:02	1	III/IV
9	PCC-EEE209	Electromagnetic Fields	03:00:00	3	III/IV
10	PCC-EEE210	Digital Electronics	03:00:00	3	III/IV
11	PCC-EEE211	Digital Electronics Lab	00:00:02	1	III/IV
12	PCC-EEE212	Electrical Machines – II	03:00:00	3	III/IV
13	PCC-EEE213	Electrical Machines Lab – II	00:00:02	1	III/IV

Total Credits: 27

Professional Core Courses (Sem V & VI)

Branch: Electrical & Electronics Engineering (B.Tech)

Sl. No.	Course Code	Course Title	Hrs. /Week L: T: P	Credits	Preferred Semester
1	PCC-EEE-301	Power Systems -I	03:00:00	3	V/VI
2	PCC-EEE-302	Power Systems Lab -I	00:00:02	1	V/VI
3	PCC-EEE-303	Control Systems	03:00:00	3	V/VI
4	PCC-EEE-304	Control Systems Lab	00:00:02	1	V/VI
5	PCC-EEE-305	Microprocessors & Microcontroller	03:00:00	3	V/VI
6	PCC-EEE-306	Microprocessors & Microcontroller Lab	00:00:02	1	V/VI
7	PCC-EEE-307	Power Systems - II	03:00:00	3	V/VI
8	PCC-EEE-308	Power Systems Lab - II	00:00:02	1	V/VI
9	PCC-EEE-309	Measurements and Instrumentation	03:00:00	3	V/VI
10	PCC-EEE-310	Measurements and Instrumentation Lab	00:00:02	1	V/VI
11	PCC-EEE-311	Power Electronics	03:00:00	3	V/VI
12	PCC-EEE-312	Power Electronics Lab	00:00:02	1	V/VI

Total Credits: 24

Professional Elective Courses (Sem V & VI)

Branch: Electrical & Electronics Engineering (B.Tech)

Sl. No.	Course Code	Course Title	Hrs. /Week L: T: P	Credits	Preferred Semester
1	PEC-EEE-301	Line Commutated and Active Rectifiers	03:00:00	3	V/VI
2	PEC-EEE-302	Electrical Drives	03:00:00	3	V/VI
3	PEC-EEE-303	Electrical Machine Design	03:00:00	3	V/VI
4	PEC-EEE-304	High Voltage Engineering	03:00:00	3	V/VI
5	PEC-EEE-305	Electrical Energy Conservation and Auditing	03:00:00	3	V/VI
6	PEC-EEE-306	Industrial Electrical Systems	03:00:00	3	V/VI
7	PEC-EEE-307	Digital Control Systems	03:00:00	3	V/VI
8	PEC-EEE-308	Digital Signal Processing	03:00:00	3	V/VI
9	PEC-EEE-309	Computer Architecture	03:00:00	3	V/VI
10	PEC-EEE-310	Computational Electromagnetics	03:00:00	3	V/VI
11	PEC-EEE-311	Control Systems Design	03:00:00	3	V/VI
12	PEC-EEE-312	Signals and Systems	03:00:00	3	V/VI

Professional Elective Courses (Sem VII & VIII)

Branch: Electrical & Electronics Engineering (B.Tech)

Sl. No.	Course Code	Course Title	Hrs. /Week L: T: P	Credits	Preferred Semester
1	PEC-EEE-401	Wind and Solar Energy Systems	03:00:00	3	VII/VIII
2	PEC-EEE-402	Electrical and Hybrid Vehicles	03:00:00	3	VII/VIII
3	PEC-EEE-403	Power System Protection	03:00:00	3	VII/VIII
4	PEC-EEE-404	HVDC Transmission Systems	03:00:00	3	VII/VIII
5	PEC-EEE-405	Power Quality and FACTS	03:00:00	3	VII/VIII
6	PEC-EEE-406	Power System Dynamics and Control	03:00:00	3	VII/VIII
7	PEC-EEE-407	Advanced Electric Drives	03:00:00	3	VII/VIII

OPEN ELECTIVE COURSES

Branch: Electrical & Electronics Engineering (B.Tech)

Sl. No	Code No.	Subject	Hrs./ Week L: T: P	Credits
1	OEC-CSE-303	Artificial Intelligence	03:00:00	3
2	OEC-CSE-304	Internet-of-Things	03:00:00	3
3	OEC-CSE-305	Machine Learning	03:00:00	3
4	OEC-CSE-306	Cloud Computing	03:00:00	3
5	OEC-CSE-307	Cryptography & Network Security	03:00:00	3
6	OEC-CSE-308	Cryptography & Network Security Lab	00:00:02	1
7	OEC-CSE-311	Computer Graphics	03:00:00	3
8	OEC-CSE-312	Computer Graphics Lab	00:00:02	1
9	OEC-CSE-313	Web App Development	03:00:00	3
10	OEC-CSE-314	Web App Development Lab	00:00:02	1
11	OEC-CSE-401	Soft Computing	03:00:00	3
12	OEC-CSE-403	Data Mining Concepts and Techniques	03:00:00	3
13	OEC-CSE-404	Natural Language Processing	03:00:00	3
14	OEC-CSE-406	Data Analytics	03:00:00	3
15	OEC-CSE-409	Mobile Computing	03:00:00	3
16	OEC-CSE-410	Mobile Computing Lab	00:00:02	1
17	OEC-CSE-411	Image Processing	03:00:00	3
18	OEC-CSE-412	Image Processing Lab	00:00:02	1
19	OEC-ECE-301	Information Theory and Coding	03:00:00	3
20	OEC-ECE-302	Introduction to MEMS	03:00:00	3
21	OEC-ECE-303	CMOS Design	03:00:00	3
22	OEC-ECE-304	Nano Electronics	03:00:00	3
23	OEC-ECE-401	Microwave Theory and Techniques	03:00:00	3
24	OEC-ECE-402	Fiber Optic Communications	03:00:00	3
25	OEC-ECE-403	Adaptive Signal Processing	03:00:00	3
26	OEC-ECE-404	Antennas and Propagation	03:00:00	3
27	OEC-ECE-405	Mobile Communication and Networks	03:00:00	3
28	OEC-ECE-406	Mixed Signal Design	03:00:00	3
29	OEC-ECE-407	Wireless Sensor Networks	03:00:00	3
30	OEC-ECE-408	Satellite Communication	03:00:00	3
31	OEC-ECE-409	High Speed Electronics	03:00:00	3
32	OEC-ECE-410	Wavelets	03:00:00	3
33	OEC-ECE-411	Embedded systems	03:00:00	3
34	OEC-ECE-412	Error Correcting Codes	03:00:00	3

Project

Branch: Electrical & Electronics Engineering (B.Tech)

Sl. No.	Course Code	Course Title	Hrs. /Week L: T: P	Credits	Preferred Semester
1	EEE-P1	Project Stage-I	00:00:04	2	VI
2	EEE-P2	Project Stage-II	00:00:06	3	VII
3	EEE-P3	Project Stage-III	00:00:16	8	VIII
			Total Credits:	**13**	

COURSE STRUCTURE

SEMESTER I (1st YEAR]

Branch: Electrical & Electronics Engineering (B.Tech)

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 (1st YEAR)

Branch: Electrical & Electronics Engineering (B.Tech)

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-105	Programming for Problem Solving	3	0	0	3	30	70	100
4	Humanities and Social Sciences including Management Courses	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 (2nd YEAR]

Branch: Electrical & Electronics Engineering (B.Tech)

Sl. No.	Category	Course Code	Course Title	Hours L	Hours T	Hours P	Credit	Marks IA	Marks ESE	Marks Total
Theory										
1	Basic Science Course	BSC-107	Math-III	3	1	0	4	30	70	100
2	Professional Core Courses	PCC-EEE-203	Electronics Devices	3	0	0	3	30	70	100
3	Professional Core Courses	PCC-EEE-201	Electrical Circuit Analysis	3	0	0	3	30	70	100
4	Professional Core Courses	PCC-EEE-207	Electrical Machine-I	3	0	0	3	30	70	100
5	Humanities and Social Sciences including Management Courses	HSMC-102	Technical Communication	2	0	0	2	30	70	100
						Total(A)	15	150	350	500
Practical/Drawing/Design										
1	Professional Core Courses	PCC-EEE-202	Electrical Circuit Analysis Lab	0	0	2	1	30	20	50
2	Professional Core Courses	PCC-EEE-208	Electrical Machine Lab-I	0	0	2	1	30	20	50
3	Humanities and Social Sciences including Management Courses	HSMC-103	Technical Communication Lab	0	0	2	1	30	20	50
4	Professional Core Courses	PCC-EEE-204	Electronics Devices Lab	0	0	2	1	30	20	50
						Total(B)	4	120	80	200
		Grand Total (A+B)					19	270	430	700

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination

Electricals and Electronics Engineering Department, Sarala Birla University, Ranchi

COURSE STRUCTURE

SEMESTER-IV (2nd YEAR)

Branch: Electrical & Electronics Engineering (B.Tech)

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Mandatory Courses	MC-102	Environmental Science	2	0	0	2	30	70	100
2	Professional Core Courses	PCC-EEE-205	Analog Electronics	3	0	0	3	30	70	100
3	Professional Core Courses	PCC-EEE-209	Electromagnetic Fields	3	0	0	3	30	70	100
4	Professional Core Courses	PCC-EEE-212	Electrical Machine-II	3	0	0	3	30	70	100
5	Professional Core Courses	PCC-EEE-210	Digital Electronics	3	0	0	3	30	70	100
6	Engineering Science Course	ESC-107	Engineering Mechanics	3	1	0	4	25	75	100
7	Mandatory Courses	MC-103	Values & Ethics	2	0	0	2	30	70	100
			Total(A)				20	205	495	700
Practical/Drawing/Design										
1	Professional Core Courses	PCC-EEE-211	Digital Electronics Lab	0	0	2	1	30	20	50
2	Professional Core Courses	PCC-EEE-206	Analog Electronics Lab	0	0	2	1	30	20	50
3	Professional Core Courses	PCC-EEE-213	Electrical Machine Lab-II	0	0	2	1	30	20	50
			Total(B)				3	90	60	150
			Grand Total (A+B)				23	295	555	850

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination

COURSE STRUCTURE

SEMESTER-V (3rd YEAR)

Branch: Electrical & Electronics Engineering (B.Tech)

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Professional Core Courses	PCC-EEE-301	Power System-I	3	0	0	3	30	70	100
2	Professional Core Courses	PCC-EEE-303	Control System	3	0	0	3	30	70	100
3	Professional Core Courses	PCC-EEE-305	Microprocessors and Microcontroller	3	0	0	3	30	70	100
4	Professional Elective Course		Professional Elective Course-I	3	0	0	3	30	70	100
5	Professional Core Courses	PCC-EEE-311	Power Electronics	3	0	0	3	30	70	100
6	Humanities and Social Sciences including Management Courses		Foreign Languages-I	2	0	0	2	30	70	100
			Total(A)				**17**	**180**	**420**	**600**
Practical/Drawing/Design										
1	Professional Core Courses	PCC-EEE-304	Control System lab	0	0	2	1	30	20	50
2	Professional Core Courses	PCC-EEE-306	Microprocessors and Microcontroller Lab	0	0	2	1	30	20	50
3	Professional Core Courses	PCC-EEE-312	Power Electronics Lab	0	0	2	1	30	20	50
4	Professional Core Courses	PCC-EEE-302	Power System Lab-I	0	0	2	1	30	20	50
			Total(B)				**4**	**120**	**80**	**200**
			Grand Total (A+B)				**21**	**300**	**500**	**800**

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

COURSE STRUCTURE

SEMESTER-VI (3rd YEAR)

Branch: Electrical & Electronics Engineering (B.Tech)

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Basic Science Course	HSMC-104	Organisational Behaviour	2	0	0	2	30	70	100
2	Professional Core Courses	PCC-EEE-307	Power System-II	3	0	0	3	30	70	100
3	Professional Core Courses	PCC-EEE-309	Measurement & Instrumentation	3	0	0	3	30	70	100
4	Professional Elective Course		Professional Elective Course-II	3	0	0	3	30	70	100
5	Open Elective Course		Open Elective Course -I	3	0	0	3	30	70	100
6	Humanities and Social Sciences including Management Courses		Foreign Languages-II	2	0	0	2	30	70	100
			Total(A)				16	180	420	600
Practical/Drawing/Design										
1	Professional Core Courses	PCC-EEE-308	Power System Lab-II	0	0	2	1	30	20	50
2	Professional Core Courses	PCC-EEE-310	Measurement & Instrumentation Lab	0	0	2	1	30	20	50
3	Project Stage-I	EEE-P1	Mini Project/ Electrical & Electronic Design Workshop	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 (4th YEAR)

Branch: Electrical & Electronics Engineering (B.Tech)

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Professional Elective Course		Professional Elective Course-III	3	0	0	3	30	70	100
2	Professional Elective Course		Professional Elective Course-IV	3	0	0	3	30	70	100
3	Open Elective Course		Open Elective Course-II	3	0	0	3	30	70	100
4	Open Elective Course		Open Elective Course-III	3	0	0	3	30	70	100
5	Open Elective Course		Open Elective Course-IV	3	0	0	3	30	70	100
6	Humanities and Social Sciences including Management Courses	HSMC-107	Professional Practice, Law & Ethics	2	0	0	2	30	70	100
						Total(A)	17	180	420	600
Practical/Drawing/Design										
1	Project Stage-II	EEE-P2	Project Work	0	0	6	3	150	50	200
						Total(B)	3	150	50	200
			Grand Total (A+B)				20	330	470	800

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

COURSE STRUCTURE

SEMESTER-VIII (4th YEAR)

Branch: Electrical & Electronics Engineering (B.Tech)

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Professional Elective Course		Professional Elective Course-V	3	0	0	3	30	70	100
2	Professional Elective Course		Professional Elective Course-VI	3	0	0	3	30	70	100
3	Open Elective Course		Open Elective Course-V	3	0	0	3	30	70	100
4	Open Elective Course		Open Elective Course-VI	3	0	0	3	30	70	100
						Total(A)	12	120	280	400
Practical/Drawing/Design										
1	Project Stage-III	EEE-P3	Project Work & Dissertation	0	0	16	8	300	100	400
						Total(B)	8	300	100	400
			Grand Total (A+B)				20	420	380	800

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