

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 2018-19

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
OEC	Open Electives Courses
MC	Mandatory Courses
PCC-EEE	Professional Core Course
PEC-EEE	Professional Electives Course
EEE-P1	Project Stage-I
EEE-P2	Project Stage-II
EEE-P3	Project Stage-III

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	51
5	Professional Elective course relevant to chosen specialization/branch	24
6	Open subjects – Electives from other technical and /or emerging subjects	12
7	Project work, seminar and internship in industry or elsewhere	16
8	Mandatory Course [Environmental Sciences, Induction Program, Indian Constitution, Essence of Indian Traditional Knowledge]	4
Total Credits:		164

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	0	12	0	0	0	0	19
4th	0	0	4	15	0	0	0	4	23
5th	2	0	0	12	3	3	0	0	20
6th	4	0	0	8	3	6	2	0	23
7th	2	0	0	4	6	3	5	0	20
8th	0	0	0	0	12	0	9	0	21
Total Credit Course-wise	14	23	20	51	24	12	16	4	164
Total Credit									164

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	

ENGINEERING SCIENCE COURSES

Sl. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			L	T	P		
1	ESC-099	Basic Electrical Engineering	3	1	0	4	I
2	ESC-100	Basic Electrical 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	

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	

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-EEE-201	Electrical Circuit Analysis	3:0:0	3	III/IV
2	PCC-EEE-202	Electrical Circuit Analysis Lab	0:0:2	1	III/IV
3	PCC-EEE-203	Electronics Devices	3:0:0	3	III/IV
4	PCC-EEE-204	Electronics Devices Lab	0:0:2	1	III/IV
5	PCC-EEE-205	Analog Electronics	3:0:0	3	III/IV
6	PCC-EEE-206	Analog Electronics Lab	0:0:2	1	III/IV
7	PCC-EEE-207	Electrical Machines-I	3:0:0	3	III/IV
8	PCC-EEE-208	Electrical Machines Lab-I	0:0:2	1	III/IV
9	PCC-EEE-209	Electromagnetic Fields	3:0:0	3	III/IV
10	PCC-EEE-210	Digital Electronics	3:0:0	3	III/IV
11	PCC-EEE-211	Digital Electronics Lab	0:0:2	1	III/IV
12	PCC-EEE-212	Electrical Machines-II	3:0:0	3	III/IV
13	PCC-EEE-213	Electrical Machines Lab-II	0:0:2	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	3:0:0	3	V/VI
2	PCC-EEE-302	Power Systems Lab-I	0:0:2	1	V/VI
3	PCC-EEE-303	Control Systems	3:0:0	3	V/VI
4	PCC-EEE-304	Control Systems Lab	0:0:2	1	V/VI
5	PCC-EEE-305	Measurements & Instrumentation	3:0:0	3	V/VI
6	PCC-EEE-306	Measurements & Instrumentation Lab	0:0:2	1	V/VI
7	PCC-EEE-307	Power Systems-II	3:0:0	3	V/VI
8	PCC-EEE-308	Power Systems Lab-II	0:0:2	1	V/VI
9	PCC-EEE-309	Power Electronics	3:0:0	3	V/VI
10	PCC-EEE-310	Power Electronics Lab	0:0:2	1	V/VI
Total Credits:				20	

Professional Core 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	PCC-EEE-401	Microprocessors & Microcontroller	3:0:0	3	V/VI
2	PCC-EEE-402	Microprocessors & Microcontroller Lab	0:0:2	1	V/VI
Total Credits:				4	

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	High Voltage Engineering	3:0:0	3	V/VI
2	PEC-EEE-302	Line Commutated and Active Rectifiers	3:0:0	3	V/VI
3	PEC-EEE-303	Electrical Drives	3:0:0	3	V/VI
4	PEC-EEE-304	Electrical Machine Design	3:0:0	3	V/VI
5	PEC-EEE-305	Computer Architecture	3:0:0	3	V/VI
6	PEC-EEE-306	Electrical Energy Conservation & Auditing	3:0:0	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	Power System Protection	3:0:0	3	VII/VIII
2	PEC-EEE-402	Electrical & Hybrid Vehicles	3:0:0	3	VII/VIII
3	PEC-EEE-403	Control Systems Design	3:0:0	3	VII/VIII
4	PEC-EEE-404	Industrial Electrical Systems	3:0:0	3	VII/VIII
5	PEC-EEE-405	Digital Control Systems	3:0:0	3	VII/VIII
6	PEC-EEE-406	Digital Signal Processing	3:0:0	3	VII/VIII
7	PEC-EEE-407	Computational Electromagnetics	3:0:0	3	VII/VIII
8	PEC-EEE-408	Control Systems Design	3:0:0	3	VII/VIII
9	PEC-EEE-409	Power Quality & FACTS	3:0:0	3	VII/VIII
10	PEC-EEE-410	HVDC Transmission Systems	3:0:0	3	VII/VIII
11	PEC-EEE-411	Advanced Electric Drives	3:0:0	3	VII/VIII
12	PEC-EEE-412	Operation Research	3:0:0	3	VII/VIII

OPEN ELECTIVE COURSES

Branch: Electrical & Electronics Engineering

Sl. No	Code No.	Subject	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-ME-408	Wind & Solar Energy Systems	3:0:0	3
4	OEC-ECE-205	Signal & System	3:0:0	3

Project Work

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 (Mini Project/ Industrial Training)	0:0:4	2	VI
2	EEE-P2	Project Stage-II (Minor Project)	0:0:10	5	VII
3	EEE-P3	Project Stage-III (Major Project Work & Dissertation)	0:0:18	9	VIII
Total Credits:				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 (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-099	Basic Electrical 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-100	Basic Electrical 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-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 (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	Basic Science Course	BSC-107	Mathematics –III	3	1	0	4	30	70	100
2	Professional Core Course	PCC-EEE-201	Electrical Circuit Analysis	3	0	0	3	30	70	100
3	Professional Core Course	PCC-EEE-203	Electronics Devices	3	0	0	3	30	70	100
4	Professional Core Course	PCC-EEE-207	Electrical Machine-I	3	0	0	3	30	70	100
5	Humanities and Social Sciences including Management Course	HSMC-102	Technical Communication	2	0	0	2	30	70	100
Total(A)							15	150	350	500
Practical/Drawing/Design										
1	Professional Core Course	PCC-EEE-202	Electrical Circuit Analysis Lab	0	0	2	1	30	20	50
2	Professional Core Course	PCC-EEE-208	Electrical Machine Lab-I	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 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										

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 Course	MC-102	Environmental Science	2	0	0	2	30	70	100
2	Professional Core Course	PCC-EEE-205	Analog Electronics	3	0	0	3	30	70	100
3	Professional Core Course	PCC-EEE-209	Electromagnetic Fields	3	0	0	3	30	70	100
4	Professional Core Course	PCC-EEE-212	Electrical Machine-II	3	0	0	3	30	70	100
5	Professional Core Course	PCC-EEE-210	Digital Electronics	3	0	0	3	30	70	100
6	Engineering Science Course	ESC-107	Engineering Mechanics	3	1	0	4	30	70	100
7	Mandatory Course	MC-103	Values & Ethics	2	0	0	2	30	70	100
Total(A)							20	210	490	700
Practical/Drawing/Design										
1	Professional Core Course	PCC-EEE-211	Digital Electronics Lab	0	0	2	1	30	20	50
2	Professional Core Course	PCC-EEE-206	Analog Electronics Lab	0	0	2	1	30	20	50
3	Professional Core Course	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	300	550	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 Course	PCC-EEE-301	Power System-I	3	0	0	3	30	70	100
2	Professional Core Course	PCC-EEE-303	Control System	3	0	0	3	30	70	100
3	Professional Core Course	PCC-EEE-305	Measurement & Instrumentation	3	0	0	3	30	70	100
4	Open Elective Course	OEC-CSE-303	Artificial Intelligence	3	0	0	3	30	70	100
5	Professional Elective Course	PEC-EEE-301	High Voltage Engineering	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-EEE-304	Control System Lab	0	0	2	1	30	20	50
2	Professional Core Course	PCC-EEE-306	Measurement & Instrumentation Lab	0	0	2	1	30	20	50
3	Professional Core Course	PCC-EEE-302	Power System Lab-I	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 (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 Course	PCC-EEE-307	Power System-II	3	0	0	3	30	70	100
2	Professional Core Course	PCC-EEE-309	Power Electronics	3	0	0	3	30	70	100
3	Professional Elective Course	PEC-EEE-306	Electrical Energy Conservation & Auditing	3	0	0	3	30	70	100
4	Open Elective Course	OEC-CSE-305	Machine Learning	3	0	0	3	30	70	100
5	Open Elective Course	OEC-ECE-205	Signal & System	3	0	0	3	30	70	100
6	Humanities and Social Sciences including Management Course	HSMC-104	Organisational Behaviour	2	0	0	2	30	70	100
7	Humanities and Social Sciences including Management Course	HSMC-106	French Through Communicative Approach-II	2	0	0	2	30	70	100
Total(A)							19	210	490	700
Practical/Drawing/Design										
1	Professional Core Course	PCC-EEE-308	Power System Lab-II	0	0	2	1	30	20	50
2	Professional Core Course	PCC-EEE-310	Power Electronics Lab	0	0	2	1	30	20	50
3	Project Work	EEE-P1	Project Stage-I (Mini Project/ Industrial Training)	0	0	4	2	75	25	100
Total(B)							4	135	65	200
Grand Total (A+B)							23	345	555	900
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	PEC-EEE-402	Electrical & Hybrid Vehicles	3	0	0	3	30	70	100
2	Professional Core Course	PCC-EEE-401	Microprocessors & Microcontrollers	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	Professional Elective Course	PEC-EEE-403	Control Systems Design	3	0	0	3	30	70	100
5	Humanities & Social Sciences including Management Course	HSMC-107	Professional Practice, Law & Ethics	2	0	0	2	30	70	100
Total(A)							14	150	350	500
Practical/Drawing/Design										
1	Professional Core Course	PCC-EEE-402	Microprocessors & Microcontrollers Lab	0	0	2	1	30	20	50
2	Project Work	EEE-P2	Project Stage-II (Minor Project)	0	0	10	5	150	50	200
Total(B)							6	180	70	250
Grand Total (A+B)							20	330	420	750
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	PEC-EEE-410	HVDC Transmission Systems	3	0	0	3	30	70	100
2	Professional Elective Course	PEC-EEE-409	Power Quality & FACTS	3	0	0	3	30	70	100
3	Professional Elective Course	PEC-EEE-411	Advanced Electric Drives	3	0	0	3	30	70	100
4	Professional Elective Course	PEC-EEE-401	Power System Protection	3	0	0	3	30	70	100
Total(A)							12	120	280	400
Practical/Drawing/Design										
1	Project Work	EEE-P3	Project Stage-III (Major Project Work & Dissertation)	0	0	18	9	300	100	400
Total(B)							9	300	100	400
Grand Total (A+B)							21	420	380	800
L-Lecture, T-Tutorial, P-Practical										
IA- Internal Assessment, ESE-End Semester Examination										