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
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	4	12	0	0	0	0	23
4th	0	0	0	15	0	3	0	4	22
5th	2	0	0	12	3	3	0	0	20
6th	4	0	0	8	3	3	2	0	20
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-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**	

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

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	Electronic Devices	3:0:0	3	III/IV
4	PCC-EEE-204	Electronic Devices Lab	0:0:2	1	III/IV
5	PCC-EEE-205	Measurements & Instrumentation	3:0:0	3	III/IV
6	PCC-EEE-206	Measurements & Instrumentation 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	Analog Electronics	3:0:0	3	III/IV
13	PCC-EEE-213	Analog Electronics Lab	0:0:2	1	III/IV
		Total Credits:		**27**	

Professional Core Courses (Sem V & VI)

Branch: Electrical & Electronics Engineering

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	Electrical Machines – II	3:0:0	3	V/VI
6	PCC-EEE-306	Electrical Machines Lab – II	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

Sl. No.	Course Code	Course Title	Hrs. /Week L: T: P	Credits	Preferred Semester
1	PCC-EEE-401	Microprocessors & Microcontroller	3:0:0	3	VII/VIII
2	PCC-EEE-402	Microprocessors & Microcontroller Lab	0:0:2	1	VII/VIII
		Total Credits:		**4**	

Professional Elective Courses (Sem V & VI)

Branch: Electrical & Electronics Engineering

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 and Auditing	3:0:0	3	V/VI

Professional Elective Courses (Sem VII & VIII)

Branch: Electrical & Electronics Engineering

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 (FIRST YEAR)

Branch: Electrical & Electronics 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: Electrical & Electronics 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: Electrical & Electronics 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-EEE-201	Electrical Circuit Analysis	3	0	0	3	30	70	100
3	Professional Core Course	PCC-EEE-203	Electronic Devices	3	0	0	3	30	70	100
4	Professional Core Course	PCC-EEE-205	Measurement & Instrumentation	3	0	0	3	30	70	100
5	Engineering Science Course	ESC-107	Engineering Mechanics	3	1	0	4	30	70	100
6	Humanities and Social Sciences including Management Course	HSMC-102	Technical Communication	2	0	0	2	30	70	100
						Total(A)	**19**	**180**	**420**	**600**
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-206	Measurement & Instrumentation 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 Courses	PCC-EEE-204	Electronic Devices 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: Electrical & Electronics Engineering

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Professional Core Course	PCC-EEE-207	Electrical Machine-I	3	0	0	3	30	70	100
2	Professional Core Course	PCC-EEE-209	Electromagnetic Fields	3	0	0	3	30	70	100
3	Professional Core Course	PCC-EEE-210	Digital Electronics	3	0	0	3	30	70	100
4	Professional Core Course	PCC-EEE-212	Analog Electronics	3	0	0	3	30	70	100
5	Open Elective Course	OEC-ECE-205	Signal & System	3	0	0	3	30	70	100
6	Mandatory Course	MC-102	Environmental Science	2	0	0	2	30	70	100
7	Mandatory Course	MC-103	Values & Ethics	2	0	0	2	30	70	100
						Total(A)	**19**	**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-213	Analog Electronics Lab	0	0	2	1	30	20	50
3	Professional Core Course	PCC-EEE-208	Electrical Machine Lab-I	0	0	2	1	30	20	50
						Total(B)	**3**	**90**	**60**	**150**
Grand Total (A+B)							**22**	**300**	**550**	**850**

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination

COURSE STRUCTURE

SEMESTER-V (THIRD YEAR)

Branch: Electrical & Electronics Engineering

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	Electrical Machine-II	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	Electrical Machine Lab-II	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 (THIRD YEAR)

Branch: Electrical & Electronics Engineering

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	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-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)							**20**	**315**	**485**	**800**

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination

COURSE STRUCTURE

SEMESTER VII (FOURTH YEAR)

Branch: Electrical & Electronics Engineering

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 & Microcontroller	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 and 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 & Microcontroller 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 (FOURTH YEAR)

Branch: Electrical & Electronics Engineering

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-407	Computational Electromagnetics	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