

BIRLA INSTITUTE OF TECHNOLOGY- MESRA, RANCHI
NEW COURSE STRUCTURE - To be effective for B.Tech 2020-21 Based on CBCS system & OBE model
Recommended scheme of study
(EEE)

S.No	Semester of Study (Recommended)	Category of course	Course Code (TBD) XX100x	Subjects	Mode of delivery & credits <i>L-Lecture; T-Tutorial; P-Practicals</i>			Total Credits <i>C-Credits</i>	
					L (Periods/week)	T (Periods/week)	P (Periods/week)		C
THEORY									
THEORY									
I.1	FIRST	FS <i>Foundation Sciences</i>	MA 103	Mathematics - I	3	1	0	4	
I.2			CH101	Chemistry	3	1	0	4	
I.3			<i>(General Engineering)</i>	EC101	Basic of Electronics and Communication Engineering	3	1	0	4
I.4				ME101	Basic of Mechanical Engineering	3	1	0	4
LABORATORIES									
I.5		FS & GE	CH102	Chemistry Lab	0	0	3	1.5	
I.6			EC102	Electronics and Communication Lab	0	0	3	1.5	
I.7			ME102	Engineering Graphics	0	0	4	2	
I.8		MC (Mandatory Course)	MC101/102/103/104	Choice of : NCC/NSS/PT & Games/ Creative Arts (CA)	0	0	2	1	
TOTAL (Theory + Labs)								22	
THEORY									
II.1	SECOND	FS	MA107	Mathematics - II	3	1	0	4	
II.2			PH113	Physics	3	1	0	4	
II.3		GE	CS101	Programming for problem-Solving	3	1	0	4	
II.4			EE101	Basics of Electrical Engineering	3	1	0	4	
LABORATORIES									
II.5		FS	PH114	Physics Lab	0	0	3	1.5	
II.6		GE	CS102	Programming for problem-Solving laboratories	0	0	3	1.5	
II.7			PE101	Workshop Practice	0	0	3	1.5	
II.8		MC	MC105/106/107/108	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA)	0	0	2	1	
TOTAL (Theory + Labs)								21.5	
GRAND TOTAL FOR FIRST YEAR								43.5	

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THEORY									
III.1	THIRD	FS	BE101	Biological Sciences for Engineering	2	0	0	2	
III.2		GE	IT 201	Basis of Intelligent Computing	3	0	0	3	
III.3		PC	EE201	Electrical Measurement and Instrumentation	3	0	0	3	
III.4		PC	EE253	Engineering Electromagnetics	3	1	0	4	
III.5		PC	EC203	Digital System Design	3	0	0	3	
III.6		PC	EE205	Circuit Theory	3	1	0	4	
LABORATORIES									
III.7		GE	EE102	Electrical Engineering Lab	0	0	3	1.5	
III.8		MC	MC201/202/203/204	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA)	0	0	2	1	
III.9		PC	EC204	Digital System Design Laboratory	0	0	3	1.5	
III.10	PC	EE202	Electrical Measurement and Instrumentation Laboratory	0	0	3	1.5		
TOTAL								24.5	
THEORY									
IV.1	FOURTH	FS	MA203	Numerical Methods	2	0	0	2	
IV.2			CE101	Environmental Science	2	0	0	2	
IV.3		HSS		UHV2: Understanding Harmony	2	1	0	3	
IV.4		OE		Open Elective-I/ MOOC-I	3	0	0	3	
		PC	EE251	DC Machines and Transformers	3	1	0	4	
		PC	EE203	Electrical Energy Generation and Control	3	0	0	3	
LABORATORIES									
IV.5		FS	MA2004	Numerical Methods lab	0	0	2	1	
IV.6	GE	IT202	Basic IT Workshop	0	0	2	1		
IV.7	MC	MC205/206/207/208	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA)	0	0	2	1		
IV.8	PC	EE252	Electrical Machine Laboratory - I	0	0	3	1.5		
TOTAL								21.5	
GRAND TOTAL FOR SECOND YEAR								46	

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THEORY								
V.1	FIFTH	OE		Open Elective-II/ MOOC-II	3	0	0	3
V.2		PC	EE301	AC Rotating Machines	3	0	0	3
V.3		PC	EE303	Introduction to Microprocessors and Microcontrollers	3	0	0	3
V.4		PC	EE305	Digital Signal Processing	3	1	0	4
V.5		PC	EE307	Electrical Power Transmission and Distribution	3	0	0	3
V.6		PE	EE xxx	Programme Elective-I	3	0	0	3
LABORATORIES								
V.7		PC	EE302	Electrical Machine Laboratory - II	0	0	3	1.5
V.8		PC	EE304	Microprocessors and Microcontrollers Laboratory	0	0	3	1.5
V.9	PC	EE306	Digital Signal Processing Laboratory	0	0	3	1.5	
							23.5	
THEORY								
VI.1	SIXTH	OE		Open Elective-III / MOOC-III	3	0	0	3
VI.2		PC	EE351	Control Theory	3	1	0	4
VI.3		PC	EE353	Power Electronics	3	1	0	4
VI.4		PC	EE355	Power System Analysis	3	0	0	3
VI.5		PE	EE xxx	Programme Elective-II	3	0	0	3
VI.6		HSS	MT123	Business Communications	3	0	0	3
VI.7			MT204	Constitution of India	2	0	0	0
LABORATORIES								
VI.8		PC	EE352	Control System Laboratory	0	0	3	1.5
VI.9		PC	EE354	Electrical Workshop	0	0	3	1.5
VI.10	MC	MC300	Summer Training - compulsory				2	
TOTAL							25	
GRAND TOTAL FOR THIRD YEAR							48.5	

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THEORY									
VII.1	SEVENTH	OE		Open Elective-IV / MOOC-IV	3	0	0	3	
VII.2		PC	EE401	Switchgear and Protection	3	1	0	4	
VII.3		PE	EE xxx	Programme Elective III	3	0	0	3	
VII.4		PE	EE xxx	Programme Elective IV	3	0	0	3	
LABORATORIES									
VII.5		PC	EE402	Power System Laboratory	0	0	3	1.5	
VII.6		PC	EE404	Power Electronics Laboratory	0	0	3	1.5	
VII.7		PC	EE406	Simulation Laboratory	0	0	2	1	
VII.8	PC	EE400M	Minor Project	0	0	3	3		
TOTAL								20	
VIII.1	EIGHTH			Research project / Industry Internship				10	
GRAND TOTAL FOR FOURTH YEAR								30	
GRAND TOTAL								168	

UHV2: Understanding Harmony can be offered either in 3rd or 4th semester depending upon the convenience of the Department.

BIRLA INSTITUTE OF TECHNOLOGY- MESRA, RANCHI DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
NEW COURSE STRUCTURE - To be effective from academic session 2020- 21 Based on CBCS & OBE model
LIST OF PROGRAM ELECTIVES (B. Tech.. - EEE)

Level of Study	Course Code	Courses	Pre-requisites	Mode of delivery & credits <i>L-Lecture; T-Tutorial;P-Practicals</i>			Total Credits <i>C- Credits</i>
				L <i>(Periods/ week)</i>	T <i>(Periods/ week)</i>	P <i>(Periods / week)</i>	C
Programme Elective - I							
3	EE413	Sensors and Transducers	EE201 Electrical Measurement & Instrumentation	3	0	0	3
	EE415	Bioinstrumentation and Concepts	EE201 Electrical Measurement & Instrumentation	3	0	0	3
	EE357	Electronic Devices and Analog Circuits	EC101 Basics of Electronics & Communication Engineering	3	0	0	3
	EE421	Information Technology		3	0	0	3
	EE427	Soft Computing Techniques	MA103 Mathematics - I MA107 Mathematics - II	3	0	0	3
	EE449	Artificial Intelligence for Electrical Engineering	MA103 Mathematics - I MA107 Mathematics - II	3	0	0	3
	EE447	Machine Learning	MA103 Mathematics - I MA107 Mathematics - II	3	0	0	3
Programme Elective - II							
3	EE417	Fundamentals of Communication System	EC101 Basics of Electronics & Communication Engineering	3	0	0	3
	EE411	Microprocessor Applications	EE303 Introduction to Microprocessors & Microcontrollers	3	0	0	3
	EE419	Special Electrical Machines	EE251 DC Machines and Transformer EE301 AC Rotating Machines	3	0	0	3
	EE443	Utilization of Electrical Power	EE101 Basics of Electrical Engineering EE307 Electrical Power Transmission and Distribution	3	0	0	3
	EE445	Testing and Commissioning of Electric Equipment	EE251 DC Machines and Transformer EE301 AC Rotating Machines	3	0	0	3
	EE425	Robotics	EE351 Control Theory	3	0	0	3
Programme Elective - III							
4	EE423	VLSI Systems	EC101 Basics of Electronics & Communication Engineering	3	0	0	3
	EE573	Embedded System and Applications	EE101 Basics of Electrical Engineering EC101 Basics of Electronics & Communication Engineering	3	0	0	3
	EE531	EHV AC Power Transmission	EE307 Electrical Power Transmission and Distribution EE355 Power System Analysis	3	0	0	3
	EE437	Industrial Drives and Control	EE353 Power Electronics EE351 Control Theory	3	0	0	3
	EE439	Applied Control Theory	EE351 Control Theory	3	0	0	3
	EE597	Reliability Engineering	MA103 Mathematics - I MA107 Mathematics - II	3	0	0	3
	EE441	Computer Aided Power System Analysis	EE307 Electrical Power Transmission and Distribution EE355 Power System Analysis	3	0	0	3
Programme Elective - IV							
4	EE593	High Voltage Engineering	EE101 Basics of Electrical Engineering EE201 Electrical Measurement & Instrumentation EE253 Engineering Electromagnetics	3	0	0	3

EE535	HVDC and FACTS	EE307 Electrical Power Transmission and Distribution EE355 Power System Analysis EE353 Power Electronics	3	0	0	3
EE507	Advanced Power Electronics	EE353 Power Electronics	3	0	0	3
EE539	Power System Dynamics	EE307 Electrical Power Transmission and Distribution EE355 Power System Analysis	3	0	0	3
EE585	Hybrid Electric Vehicle	EE251 DC Machines and Transformer EE301 AC Rotating Machines EE353 Power Electronics	3	0	0	3
EE605	Micro-grid Operation and Control	EE307 Electrical Power Transmission and Distribution EE355 Power System Analysis EE353 Power Electronics	3	0	0	3

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Open Electives (<i>Offered by EEE</i>)								
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					L (Periods / week)	T (Periods / week)	P (Periods / week)	C-Credits
1	OE-I		EE203	Electric Energy Generation & Control	3	0	0	3
2			EE255	Signals and Systems	3	0	0	3
3			EE257	Solar Photovoltaics: Photons to Farms	3	0	0	3
4	OE-II		EE361R1	Linear Control Theory	3	0	0	3
5			EE363	Sensors: Fabrication and Applications	3	0	0	3
6			EE365	Introduction to Sustainable Energy	3	0	0	3
7	OE-III		EE457	Fundamentals of Power System	3	0	0	3
8			EE459	Introduction to Power Electronics	3	0	0	3
9			EE425	Robotics	3	0	0	3
10	OE-IV		EE453	Machine Electronics	3	0	0	3
11			EE519	Computational Techniques in Electrical Engineering	3	0	0	3

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Minor Course (<i>Offered by EEE</i>)								
S. No	Semester of Study (Recommended)	Pre-requisites	Course Code	Subjects	Mode of delivery & credits L-Lecture; T-Tutorial; P-Practical			Total Credits
					L (Periods/ week)	T (Periods/ week)	P (Periods/ week)	C- Credits
1	FIFTH	Mathematics, Basic Electrical Engineering	EE205	Circuit Theory (For all branches except ECE)	3	1	0	4
2		Mathematics	EE305	Digital Signal Processing (For all branches except ECE)	3	1	0	4
3			EE379	Sustainable Energy Sources (For all branches)	3	1	0	4
4		Mathematics, Basic Electrical Engineering	EE351	Control Theory (For all branches except ECE)	3	1	0	4
5	SIXTH	Basic Electrical Engineering	EE261	Principles of Electrical Machines (For all branches)	3	1	0	4
6		Basic Electrical Engineering Mathematics	EE353	Power Electronics (For all branches)	3	1	0	4
7		Basic Electrical Engineering Mathematics	EE421	Power System (For all branches)	3	1	0	4
8		Control Theory	EE475	Non-linear and Adaptive Control (For all branches)	3	1	0	4
9	SEVENTH	Basic Electrical Engineering	EE452	Advanced Electrical Engineering Lab (For all branches)	0	0	4	2
Total Credits								18

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In-depth Course								
S. No	Semester of Study (Recommended)	Category of course	Course Code	Subjects	Mode of delivery & credits <i>L-Lecture; T-Tutorial ;P-Practicals</i>			Total Credits
					L (Periods/week)	T (Periods/week)	P (Periods/week)	C-Credits
1	FIFTH	Group-I (POWER SYSTEM)	EE377	Industrial Instrumentation	3	1	0	4
2	SIXTH		EE379	Sustainable Energy Sources	3	1	0	4
3	SIXTH		EE481	Advanced Power System Analysis and Control	3	1	0	4
4	SEVENTH		EE479	Smart Power System	3	1	0	4
5	SEVENTH		EE452	Advanced Electrical Engineering Laboratory	0	0	4	2
	FIFTH	Group-II (POWER ELECTRONICS)	EE377	Industrial Instrumentation	3	1	0	4
	SIXTH		EE379	Sustainable Energy Sources	3	1	0	4
6	SIXTH		EE477	Power Conversion Techniques	3	1	0	4
7	SEVENTH		EE557	Power Electronics Applications	3	1	0	4
	SEVENTH		EE452	Advanced Electrical Engineering Laboratory	0	0	4	2
	FIFTH	Group-III (CONTROL SYSTEM)	EE377	Industrial Instrumentation	3	1	0	4
	SIXTH		EE379	Sustainable Energy Sources	3	1	0	4
8	SIXTH		EE475	Non-linear and Adaptive Control	3	1	0	4
9	SEVENTH		EE375	Sensing Technology and Applications	3	1	0	4
	SEVENTH		EE452	Advanced Electrical Engineering Laboratory	0	0	4	2