BIRLA INSTITUTE OF TECHNOLOGY- MESRA, RANCHI

NEWCOURSE STRUCTURE - To be effective from academic session 2018- 19
Based on CBCS & OBE model
Recommended scheme of study
B.Tech. in Electronics & Communications Engineering

Semester/ Session of Study (Recomended)	Course Level	Category of course	Course Code	Courses	Mode of delivery & credits *L-Lecture; T-Tutorial; P-Practicals*			Total Credits *C- Credits*
					L (*Periods/ week*)	**T** (*Periods/ week*)	**P** (*Periods/ week*)	**C**
THIRD Monsoon				**THEORY**				
	FIRST	FS	BE101	Biological Science for Engineers	2	0	0	2
	SECOND	GE	IT 201	Basics of Intelligent Computing	3	0	0	3
		PC	EE205	Circuit Theory	3	1	0	4
			EC201	Electronic Devices	3	0	0	3
			EC203	Digital System Design	3	0	0	3
			EC205	Signals and Systems	3	0	0	3
				LABORATORIES				
	FIRST	GE	EE102	Electrical Engineering lab	0	0	3	1.5
	SECOND	MC	MC201/202/203/204	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA)	0	0	2	1
		PC	EC202	Electronic Devices Lab	0	0	3	1.5
			EC204	Digital System Design Lab	0	0	3	1.5
			EC208	Electronic Measurements Lab	0	0	3	1.5
TOTAL								**25**
FOURTH Spring				**THEORY**				
	SECOND	FS	MA203	Numerical Methods	2	0	0	2
	FIRST	FS	CE101	Environmental Science	2	0	0	2
	SECOND	PC	EC251	Probability and Random Processes	3	0	0	3
			EC253	Analog Circuits	3	0	0	3
			EC255	Analog Communication	3	0	0	3
			EC257	Electromagnetic Fields and Waves	3	0	0	3
				LABORATORIES				
	SECOND	FS	MA204	Numerical Methods Lab	0	0	2	1
		GE	IT202	Basic IT Workshop (Common Subject)	0	0	2	1
		MC	MC205/206/207/208	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA)	0	0	2	1
		PC	EC254	Analog Circuits Lab	0	0	3	1.5
			EC258	Electromagnetic Waves Lab	0	0	3	1.5
TOTAL								**22**

FIFTH Monsoon	THIRD	PC	EC301	Digital Communication	3	0	0	3
			EC303	Microprocessors and Microcontrollers	3	0	0	3
			EC305	Signal Processing Techniques	3	0	0	3
			EC307	Fundamentals of Data Communication	3	0	0	3
		PE		Program Electve-I	3	0	0	3
		OE		Open Electve-I	3	0	0	3
LABORATORIES								
	THIRD	PC	EC302	Communication System Lab	0	0	3	1.5
			EC304	Microprocessors and Microcontrollers Lab	0	0	3	1.5
			EC306	Signal Processing Lab	0	0	3	1.5
TOTAL								**22.5**
SIXTH Spring	THIRD	PC	EC351	Fiber Optic Communication	3	0	0	3
			EC353	Pulse, Digital and Switching System	3	0	0	3
			EE351	Control Theory	3	1	0	4
		PE		Program Electve-II	3	0	0	3
		OE		Open Electve-II	3	0	0	3
	FIRST	HSS	MT123	Business Communications	3	0	0	3
	THIRD	MC	MC300	Summer training - Mandatory				3
	SECOND	HSS	MT204	Constitution of India	2	0	0	0 Non-credit
LABORATORIES								
	THIRD	PC	EC352	Fiber Optic Communication Lab	0	0	3	1.5
		PC	EC354	Pulse, Digital and Switching System Lab	0	0	3	1.5
TOTAL								**25**
SEVENTH Monsoon	FOURTH	PC	EC401	Industrial Electronics	3	0	0	3
			EC403	Professional Practice Law & Ethics	2	0	0	2
		PE		Program Electve-III	3	0	0	3
				Program Electve-IV	3	0	0	3
		OE		Open Elective-III	3	0	0	3
				Open Elective-IV	3	0	0	3
TOTAL								**17**
EIGTH Spring	FOURTH	PC	EC400	Research project / Industry Internship	*NOT APPLICABLE*			12
GRAND TOTAL *Minimum requirement for Degree award*								**167**

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
PROGRAMME ELECTIVES (PE)*
OFFERED FOR LEVEL 1-4

PE / LEVEL	Code no.	Name of the PE courses	Prerequisite/Corequisite courses with code	L	T	P	C
		PE-I					
PE/Level-3 (MO) SEM-V	EC309	Adaptive Signal Processing	EC305 Signal Processing Techniques	3	0	0	3
	EC311	DSP Processor	EC305 Signal Processing Techniques	3	0	0	3
	EC313	Electronic Measurements	EC208 Electronic Measurement Lab	3	0	0	3
	EC315	Industrial Instrumentation	EC208 Electronic Measurement Lab	3	0	0	3
	EC319	VLSI Systems	EC101Basics of Electronics and Communication Engineering, EC201 Electronic Devices	3	0	0	3
	EC321	Microelectronic Devices and Circuits	EC101Basics of Electronics and Communication Engineering, EC201 Electronic Devices	3	0	0	3
	EC323	Microwave Theory and Techniques	EC257 Electromagnetic Fields and Waves	3	0	0	3
	EC325	Antenna and Wave Propagation	EC257 Electromagnetic Fields and Waves	3	0	0	3
	EC327	Mobile & Cellular Communication	EC255 Analog Communication, EC301 Digital Communication	3	0	0	3
	EC329	Information Theory and Coding	EC251 Probability and Random Process, EC255 Analog Communication	3	0	0	3
	EC331	Issues in Nanoscale CMOS Design	EC101 Basics of Electronics and Communication Engineering, EC201 Electronic Devices	3	0	0	3
* PROGRAMME ELECTIVES TO BE OPTED ONLY BY THE DEPARTMENT STUDENTS							

PE / LEVEL	Code no.	Name of the PE courses	Prerequisite/Corequisite courses with code	L	T	P	C
			PE-II				
PE/Level-3 (SP) SEM-VI	EC355	Time Frequency and Wavelet Transform	EC205 Signals and Systems, EC305 Signal Processing Techniques EC251Probability and Random Processes	3	0	0	3
	EC357	Speech and Audio Processing	EC205 Signals and Systems, EC305 Signal Processing Techniques EC251Probability and Random Processes	3	0	0	3
	EC359	Microcontrollers and Interfacing	EC303 Microprocessors and Microcontrollers	3	0	0	3
	EC361	Digital Systems Design with FPGAs	EC101Basics of Electronics and Communication Engineering, EC201 Electronic Devices EC203 digital System Design	3	0	0	3
	EC363	Nanoelectronics	EC101Basics of Electronics and Communication Engineering, EC201 Electronic Devices	3	0	0	3
	EC365	Radar and Navigation System	EC257 Electromagnetic Fields and Waves	3	0	0	3
	EC367	Computer Networking	EC307 Fundamentals of Data Communication	3	0	0	3
	EC369	Wireless Networks	EC307 Fundamentals of Data Communication	3	0	0	3
	EC371	Introduction to Electromagnetic Compatibility	EC257 Electromagnetic Fields and Waves	3	0	0	3
	EC373	Introduction to Sensors and Transducers	EC208 Electronic Measurement Lab	3	0	0	3
	EC375	High Speed Electronics	EC101 Basics of Electronics and Communication Engineering, EC201 Electronic Devices	3	0	0	3

* PROGRAMME ELECTIVES TO BE OPTED ONLY BY THE DEPARTMENT STUDENTS

PE / LEVEL	Code no.	Name of the PE courses	Prerequisite/Corequisite courses with code	L	T	P	C
			PE-III				
PE/Level-4(MO) SEM-VII	EC405	Digital Image & Video Processing	EC305 Signal Processing Techniques	3	0	0	3
	EC407	Multichannel Signal Processing	EC305 Signal Processing Techniques	3	0	0	3
	EC409	Fiber Optic Sensors	EC351 Fiber Optic Communication	3	0	0	3
	EC411	Mixed Signal Design	EC101 Basics of Electronics and Communication Engineering, EC201 Electronic Devices	3	0	0	3
	EC413	Real Time Embedded System	EC203 Digital System Design EC303 Microprocessors and Microcontrollers	3	0	0	3
	EC415	Semicustom IC Design	EC101 Basics of Electronics and Communication Engineering, EC201 Electronic Devices	3	0	0	3
	EC419	Satellite Communication	EC255 Analog Communication, EC301 Digital Communication	3	0	0	3
	EC421	Bio-Medical Electronics & Signal Processing	EC205 Signals and Systems, EC305 Signal Processing Techniques EC207 Probability and Random Processes	3	0	0	3

* PROGRAMME ELECTIVES TO BE OPTED ONLY BY THE DEPARTMENT STUDENTS

PE / LEVEL	Code no.	Name of the PE courses	Prerequisite/Corequisite courses with code	L	T	P	C
			PE-IV				
PE/Level-4(MO) VII SEM	EC423	Radar Engineering	EC257 Electromagnetic Fields and Waves				
	EC425	Optoelectronic devices	EC351 Fiber Optic Communication	3	0	0	3
	EC427	Neural Networks and Fuzzy System	EC205 Signals and Systems, EC305 Signal Processing Techniques	3	0	0	3
	EC429	Device Modeling & Simulation	EC101 Basics of Electronics and Communication Engineering, EC201 Electronic Devices	3	0	0	3
	EC431	Multimedia Communication	EC255 Analog Communication, EC301 Digital Communication	3	0	0	3
	EC435	ASIC Design	EC101 Basics of Electronics and Communication Engineering, EC201 Electronic Devices EC331 VLSI Systems	3	0	0	3
	EC437	VLSI System Testing	EC101 Basics of Electronics and Communication Engineering, EC201 Electronic Devices	3	0	0	3
* PROGRAMME ELECTIVES TO BE OPTED ONLY BY THE DEPARTMENT STUDENTS							

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
OPEN ELECTIVES (OE)*
OFFERED FOR LEVEL 1-4

OE / LEVEL	Code No.	Name of the OE courses	Prerequisites courses with code	L	T	P	C
		OE-I					
OE/Level-3 (MO)	EC333	Sensors and Transducers	N/A	3	0	0	3
	EC335	Consumer Electronics	N/A	3	0	0	3
		OE-II					
OE/Level-3 (SP)	EC377	Introduction to Communication System	N/A	3	0	0	3
		OE-III					
	EC441	Introduction to MEMS	N/A	3	0	0	3
OE/Level-4 (MO)	EC443	Introduction to Human- Machine Interface	N/A	3	0	0	3
		OE-IV					
	EC445	Introduction to Signal Processing	N/A	3	0	0	3

* OPEN ELECTIVES TO BE OPTED ONLY BY OTHER DEPARTMENT STUDENTS

BIRLA INSTITUTE OF TECHNOLOGY- MESRA, RANCHI
NEWCOURSE STRUCTURE - To be effective from academic session 2018- 19
Based on CBCS & OBE model
Recommended scheme of study for
Minor in Electronics & Communications Engineering

Semester/ Session of Study (Recomended)	Course Level	Category of course	Course Code	Courses	Mode of delivery & credits *L-Lecture; T-Tutorial;P-Practicals*			Total Credits *C- Credits*
					L	**T**	**P**	**C**
				THEORY				
FIFTH Monsoon	SECOND	PC	EC201/ EC203	Electronic Devices/ Digital System Design	3	0	0	3
			EC205	Signals and Systems	3	0	0	3
				LABORATORIES				
	SECOND	PC	EC202/ EC204	Electronic Devices Lab/ Digital System Design Lab	0	0	3	1.5
				TOTAL				**7.5**
SIXTH Spring	SECOND	PC	EC253	Analog Circuits	3	0	0	3
			EC255	Analog Communication	3	0	0	3
				LABORATORIES				
	SECOND	PC	EC254	Analog Circuits Lab	0	0	3	1.5
				TOTAL				**7.5**
SEVENTH Monsoon	THIRD	PC	EC301	Digital Communication	3	0	0	3
				LABORATORIES				
	FOURTH	PC	EC402	Communication Lab	0	0	3	2
				TOTAL				**5**
GRAND TOTAL *Minimum requirement for Minor degree award*								**20**

BIRLA INSTITUTE OF TECHNOLOGY- MESRA, RANCHI
NEWCOURSE STRUCTURE - To be effective from academic session 2018- 19
Based on CBCS & OBE model
Recommended scheme of study for
In-depth Specialisation in VLSI Systems

Semester/ Session of Study (Recomended)	Course Level	Category of course	Course Code	Courses	Mode of delivery & credits *L-Lecture; T-Tutorial; P-Practicals*			Total Credits *C- Credits*
					L	**T**	**P**	**C**
				THEORY				
FIFTH Monsoon	THIRD	PE	EC319	VLSI Systems	3	0	0	3
	THIRD	PE	EC321	Microelectronic Devices and Circuits	3	0	0	3
				LABORATORIES				
	THIRD	PC	EC320	VLSI Systems Lab	0	0	3	1.5
TOTAL								**7.5**
SIXTH Spring	THIRD	PE	EC361	Digital Systems Design with FPGAs	3	0	0	3
	THIRD	PE	EC363	Nanoelectronics	3	0	0	3
				LABORATORIES				
	THIRD	PC	EC362	Digital Systems Design with FPGAs Lab	0	0	4	2
TOTAL								**8**
SEVENTH Monsoon	FOURTH	PE	EC413	Real Time Embedded System	3	0	0	3
				LABORATORIES				
	FOURTH	PC	EC414	Real Time Embedded System Lab	0	0	3	1.5
TOTAL								**4.5**
GRAND TOTAL *Minimum requirement for In-depth Specialisation award*								**20**

BIRLA INSTITUTE OF TECHNOLOGY- MESRA, RANCHI
NEWCOURSE STRUCTURE - To be effective from academic session 2018- 19
Based on CBCS & OBE model
Recommended scheme of study for
In-depth Specialisation in Signal Processing

Semester/ Session of Study (Recomended)	Course Level	Category of course	Course Code	Courses	Mode of delivery & credits *L-Lecture; T-Tutorial;P-Practicals*			Total Credits *C- Credits*
					L	T	P	C
				THEORY				
FIFTH Monsoon	THIRD	PE	EC309	Adaptive Signal Processing	3	0	0	3
	THIRD	PE	EC311	DSP Processor	3	0	0	3
				LABORATORIES				
	THIRD	PC	EC312	DSP Processor Lab	0	0	3	1.5
TOTAL								**7.5**
SIXTH Spring	THIRD	PE	EC355	Time Frequency and Wavelet Transform	3	0	0	3
			EC357	Speech and Audio Processing	3	0	0	3
				LABORATORIES				
	THIRD	PC	EC356	Time Frequency and Wavelet Transform Lab	0	0	3	1.5
TOTAL								**7.5**
SEVENTH Monsoon	FOURTH	PE	EC405	Digital & Video Image Processing	3	0	0	3
				LABORATORIES				
	FOURTH	PC	EC406	Image Processing Lab	0	0	4	2
TOTAL								**5**
GRAND TOTAL *Minimum requirement for In-depth Specialisation award*								**20**

BIRLA INSTITUTE OF TECHNOLOGY- MESRA, RANCHI
NEWCOURSE STRUCTURE - To be effective from academic session 2018- 19
Based on CBCS & OBE model
Recommended scheme of study for
In-depth Specialisation in Wireless Communication and Networking

Semester/ Session of Study (Recomended)	Course Level	Category of course	Course Code	Courses	Mode of delivery & credits *L-Lecture; T-Tutorial;P-Practicals*			Total Credits *C- Credits*
					L	**T**	**P**	**C**
				THEORY				
FIFTH Monsoon	THIRD	PE	EC327	Mobile and Cellular Communication	3	0	0	3
			EC329	Information Theory and Coding	3	0	0	3
				LABORATORIES				
	THIRD	PC	EC328	Mobile and Cellular Communication Lab	0	0	3	1.5
TOTAL								**7.5**
SIXTH Spring	THIRD	PE	EC367	Computer Networking	3	0	0	3
			EC369	Wireless Networks	3	0	0	3
				LABORATORIES				
	THIRD	PC	EC370	Wireless Networks Lab	0	0	3	1.5
TOTAL								**7.5**
SEVENTH Monsoon	FOURTH	PE	EC419	Satellite Communication	3	0	0	3
				LABORATORIES				
	FOURTH	PC	EC420	Advanced Communication Lab	0	0	4	2
TOTAL								**5**
GRAND TOTAL *Minimum requirement for In-depth Specialisation award*								**20**

BIRLA INSTITUTE OF TECHNOLOGY- MESRA, RANCHI
NEWCOURSE STRUCTURE - To be effective from academic session 2018- 19
Based on CBCS & OBE model
Recommended scheme of study for
In-depth Specialisation in Microwave Engineering

Semester/ Session of Study (Recomended)	Course Level	Category of course	Course Code	Courses	Mode of delivery & credits *L-Lecture; T-Tutorial;P-Practicals*			Total Credits *C- Credits*
					L	T	P	C
				THEORY				
FIFTH Monsoon	THIRD	PE	EC323	Microwave Theory and Techniques	3	0	0	3
			EC325	Antenna and Wave Propagation	3	0	0	3
				LABORATORIES				
	THIRD	PC	EC324	Mirowave Engineering Lab	0	0	3	1.5
TOTAL								**7.5**
SIXTH Spring	THIRD	PE	EC365	Radar and Navigation System	3	0	0	3
			EC371	Introduction to Electromagnetic Compatibility	3	0	0	3
				LABORATORIES				
	THIRD	PC	EC366	Mirowave Measurement Lab	0	0	3	1.5
TOTAL								**7.5**
SEVENTH Monsoon	FOURTH	PE	EC419	Satellite Communication	3	0	0	3
				LABORATORIES				
	FOURTH	PC	EC420	Advanced Communication Lab	0	0	4	2
TOTAL								**5**
GRAND TOTAL *Minimum requirement for In-depth Specialisation award*								**20**

BIRLA INSTITUTE OF TECHNOLOGY- MESRA, RANCHI
NEWCOURSE STRUCTURE - To be effective from academic session 2018- 19
Based on CBCS & OBE model
Recommended scheme of study for
In-depth Specialisation in Electronic Instrumentation

Semester/ Session of Study (Recomended)	Course Level	Category of course	Course Code	Courses	Mode of delivery & credits *L-Lecture; T-Tutorial;P-Practicals*			Total Credits *C- Credits*
					L	T	P	C
THEORY								
FIFTH Monsoon	THIRD	PE	EC313	Electronic Measurements	3	0	0	3
	THIRD	PE	EC315	Industrial Instrumentation	3	0	0	3
LABORATORIES								
	THIRD	PC	EC316	Industrial Instrumentation Lab	0	0	4	2
TOTAL								**8**
SIXTH Spring	THIRD	PE	EC359	Microcontrollers and Interfacing	3	0	0	3
	THIRD	PE	EC373	Introduction to Sensors and Transducers	3	0	0	3
LABORATORIES								
	THIRD	PC	EC360	Microcontroller Lab	0	0	3	1.5
TOTAL								**7.5**
SEVENTH Monsoon	FOURTH	PE	EC421	Bio-Medical Electronics & Signal Processing	3	0	0	3
LABORATORIES								
	FOURTH	PC	EC422	Bio-Medical Signal Processing Lab	0	0	3	1.5
TOTAL								**4.5**
GRAND TOTAL *Minimum requirement for In-depth Specialisation award*								**20**