B. Tech.
Electronics and Communication Engineering

COURSE STRUCTURE/ COURSE CURRICULUM

As per the NEP 2020 guidelines (with effect from session 2024-25)

Department of Electronics and Communication Engineering
Jamia Millia Islamia

B. Tech. Electronics and Communication Engineering Course Structure

Codes for nature of courses

L : Lecture courses

P : Laboratory Based courses

S: Seminar

Category of Courses

PCC : Program Core courses

Weightage for Course Evaluation

L : Lecture T : Tutorial P : Practical CCA : Continuous Class Assessment MTE :Mid Term Exam

B. Tech. Electronics and Communication Engineering - I Year

I Year												
S.No.	**Course No.**	**Course Name**	**Type of Course**		**Credits**	**Periods/ week**			**Hours**	**Examination Scheme (Distribution of Marks)**		
										Mid Semester Evaluation	**End Semester Evaluation**	**Total Marks**
						L	**T**	**P**		**CCA/MTE - 1/MTE-2**		
I Semester												
THEORY												
1	AST-101	Communication Skills	Theory	HSMC	2	2	0	0	2	20	30	50
2	ASB-101	Engineering Physics I	Theory	BSC	3	3	0	0	3	30	45	75
3	ASB-102	Engineering Chemistry	Theory	BSC	3	3	0	0	3	30	45	75
4	ASB-103	Engineering Mathematics I	Theory	BSC	3	3	0	0	3	30	45	75
5	EES-101	Basics of Electrical Engineering	Theory	ESC	3	3	0	0	3	30	45	75
6	CSS-101	Fundamentals of Computing	Theory	ESC	3	3	0	0	3	30	45	75
7	ASM-101	Environmental Science	Theory	MC-I	2	2	0	0	2	20	30	50
PRACTICAL (LAB.)												
I	ASL-101	Language Laboratory	Lab	HSMC	1	0	0	2	2	15	10	25

II	ASL-102	Engineering Physics Laboratory I	Lab	BSC	1	0	0	2	2	15	10	25
III	ASL-103	Engineering Chemistry Laboratory	Lab	BSC	1	0	0	2	2	15	10	25
IV	MEL-104	Engineering Graphics & Design	Lab	BSC	2	0	0	4	4	30	20	50
		Total			**24**	19	0	10	29			
II Semester												
THEORY												
1	ASB-201	Engineering Physics II	Theory	BSC	3	3	0	0	3	30	45	75
2	ASB-202	Engineering Mathematics II	Theory	BSC	3	3	0	0	3	30	45	75
3	ASB-203	Biology for Engineers	Theory	BSC	3	3	0	0	3	30	45	75
4	ECS-201	Basics of Electronics & Communication Engineering	Theory	ESC	3	3	0	0	3	30	45	75
5	MES-201	Basics of Mechanical Engineering	Theory	ESC	3	3	0	0	3	30	45	75
6	CES-201	Basics of Civil Engineering	Theory	ESC	3	3	0	0	3	30	45	75
7	ASM-201	Constitution of India	Theory	MC-II (Audit)	0	2	0	0	2	-	-	-
PRACTICAL (LAB.)												
i	ASL-201	Engineering Physics Laboratory II	Lab	BSC	1	0	0	2	2	15	10	25
ii	MEL-201	Workshop Practice	Lab	ESC	2	0	0	4	4	30	20	50
iii	MEL-202	Engineering Mechanics Laboratory	Lab	ESC	1	0	0	2	2	15	10	25
iv	ECL-201	Design Thinking & Idea Lab	Lab	ESC	1	0	0	2	2	15	10	25
		Total			**23**	20	0	10	30			

B. Tech. Electronics and Communication Engineering - II Year

II Year												
S.No.	**Course No.**	**Course Name**	**Type ofCourse**		**Credits**	**Periods/ week**			**Hours**	**Examination Scheme (Distribution of Marks)**		
										Mid Semester Evaluation	**End Semester Evaluation**	**Total Marks**
						L	**T**	**P**		**CCA/MTE - 1/MTE-2**		
III Semester												
THEORY												
1	ASM-301	Universal Human Values	Theory	MC-III	3	3	0	0	3	30	45	75
2	ASB-301	Engineering Mathematics III	Theory	BSC	3	3	0	0	3	30	45	75
3	ECC-301	Electronic Devices and Circuits-I	Theory	PCC	3	3	0	0	3	30	45	75
4	ECC-302	Circuit Analysis and Synthesis	Theory	PCC	3	3	0	0	3	30	45	75
5	ECC-303	Logic Design	Theory	PCC	3	3	0	0	3	30	45	75
6	ECC-304	Signals and Systems	Theory	PCC	3	3	0	0	3	30	45	75
7	ASM-302	Essence of Indian Traditional Knowledge	Theory	MC-IV(Audit)	0	2	0	0	2	-	-	-
PRACTICAL (LAB.)												
I	ECL-301	Electronic Devices and Circuits-I Lab	Lab	PCC	1	0	0	2	2	15	10	25
II	ECL-302	Circuit Analysis and Synthesis Lab	Lab	PCC	1	0	0	2	2	15	10	25
III	ECL-303	Logic Design Lab	Lab	PCC	1	0	0	2	2	15	10	25

IV	ECL-304	Electronics Workshop	Lab	PCC	1	0	0	2	2	15	10	25
		Total			**22**	20	0	8	28			
IV Semester												
THEORY												
1	ECC-401	Electronic Devices and Circuits-II	Theory	PCC	3	3	0	0	3	30	45	75
2	ECC-402	Computer Architecture	Theory	PCC	3	3	0	0	3	30	45	75
3	ECC-403	Analog Communication	Theory	PCC	3	3	0	0	3	30	45	75
4	AST-401	Operations Research	Theory	HSMC (OEC I)	3	3	0	0	3	30	45	75
5	AST-402	Economics	Theory	HSMC (OEC II)	3	3	0	0	3	30	45	75
PRACTICAL (LAB.)												
I	ECL-401	Electronic Devices and Circuits-II Lab	Lab	PCC	1	0	0	2	2	15	10	25
II	ECL-402	Computer Architecture Lab	Lab	PCC	1	0	0	2	2	15	10	25
III	ECL-403	Analog Communication Lab	Lab	PCC	1	0	0	2	2	15	10	25
IV	ASL-401	Numeric and Scientific Computing Lab.	Lab	ESC	2	0	0	4	4	30	20	50
		Total			**20**	15	0	10	25			

B. Tech. Electronics and Communication Engineering - III Year

II Year												
S.No.	**Course No.**	**Course Name**	**Type ofCourse**		**Credits**	**Periods/ week**			**Hours**	**Examination Scheme (Distribution of Marks)**		
										Mid Semester Evaluation	**End Semester Evaluation**	**Total Marks**
						L	**T**	**P**		**CCA/MTE - 1/MTE-2**		
V Semester												
THEORY												
1	ECC-501	Active Filters and Signal Processing	Theory	PCC	3	3	0	0	3	30	45	75
2	ECC-502	Digital Communication	Theory	PCC	3	3	0	0	3	30	45	75
3	ECC-503	Microprocessors and Applications	Theory	PCC	3	3	0	0	3	30	45	75
4	ECC-504	Electromagnetic Field Theory	Theory	PCC	3	3	0	0	3	30	45	75
5	ECC-505	Instrumentation and Control Systems	Theory	PCC	3	3	0	0	3	30	45	75
6	ECE-50x	ECE-501 Antenna and Wave Propagation ECE-502 Bio-medical Electronics ECE-503 High Speed Electronics	Theory	PEC	3	3	0	0	3	30	45	75
PRACTICAL (LAB.)												
I	ECL-501	Active Filters and Signal Processing Lab	Lab	PCC	1	0	0	2	2	15	10	25
II	ECL-502	Digital Communication Lab	Lab	PCC	1	0	0	2	2	15	10	25

III	ECL-503	Microprocessors and Applications Lab	Lab	PCC	1	0	0	2	2	15	10	25
IV	ECL-504	Instrumentation and Control Systems Lab	Lab	PCC	1	0	0	2	2	15	10	25
		Total			**22**	18	0	8	26			
VI Semester												
THEORY												
1	ECC-601	VLSI Design	Theory	PCC	3	3	0	0	3	30	45	75
2	ECC-602	DSP	Theory	PCC	3	3	0	0	3	30	45	75
3	ECC-603	Microwave Engineering	Theory	PCC	3	3	0	0	3	30	45	75
4	ECC-604	DCCN	Theory	PCC	3	3	0	0	3	30	45	75
5	ECE-60x	ECE-601 DSD ECE-602 Adaptive Signal Processing ECE-603 DCS	Theory	PEC	3	3	0	0	3	30	45	75
PRACTICAL (LAB.)												
I	ECL-601	VLSI Design Lab	Lab	PCC	1	0	0	2	2	15	10	25
II	ECL-602	DSP Lab	Lab	PCC	1	0	0	2	2	15	10	25
III	ECL-603	Microwave Engineering Lab	Lab	PCC	1	0	0	2	2	15	10	25
IV	ECL-604	DCCN Lab	Lab	PCC	1	0	0	2	2	15	10	25
V	ECP-601	Seminar (Literature Review)		PROJ	1	0	0	2	2	15	10	25
		Total			**20**	15	0	10	25			

B. Tech. Electronics and Communication Engineering - IV Year

II Year												
S.No.	**Course No.**	**Course Name**	**Type ofCourse**		**Credits**	**Periods/ week**			**Hours**	**Examination Scheme (Distribution of Marks)**		
										Mid Semester Evaluation	**End Semester Evaluation**	**Total Marks**
						L	**T**	**P**		**CCA/MTE - 1/MTE-2**		
VII Semester												
THEORY												
1	ECE-70x	ECE-701 Embedded Systems ECE-702 Digital Image Processing ECE-703 Organic Electronics	Theory	PEC	3	3	0	0	3	30	45	75
2	ECE-70x	ECE-704 Information Theory and Coding ECE-705 High Speed Communication Networks ECE-706 MIMO Wireless Communication	Theory	PEC	3	3	0	0	3	30	45	75
3	ECE-70x	ECE-707 Optical Fiber Communication ECE-708 Fuzzy Logic and Neural Networks ECE-709 Wireless Sensor Networks	Theory	PEC	3	3	0	0	3	30	45	75
4	ECE-71x	ECE-710 Mobile	Theory	PEC	3	3	0	0	3	30	45	75

		Communication ECE-711 Radar Systems ECE-712 Satellite Communication										
5	ECO-70x	ECO-701 Internet of Things (IoT) ECO-702 Probability and Stochastic Process ECO-703 Digital System Design	Theory	OEC	3	3	0	0	3	30	45	75
PRACTICAL (LAB.)												
I	ECP-701	Summer Internship	Project-II	PROJ	2	0	0	4	4	30	20	50
II	ECP-702	Project	Project-III	PROJ	3	0	0	6	6	45	30	75
		Total			**20**	15	0	10	25			
VIII Semester												
THEORY												
1	ECO-80x	ECO-801 Introduction to MEMS and NEMS * ECO-802 Nano-electronics Devices* ECO-803 Device Modeling and Circuit Simulation*	Theory	OEC	3	3	0	0	3	30	45	75
2	ECO-80x	ECO-804 Wireless Communication ECO-805 Information Theory for Cyber Security* ECO-806 Introduction to	Theory	OEC	3	3	0	0	3	30	45	75

		AI and ML*										
PRACTICAL (LAB.)												
I	ECP-801	Project	Project-IV	PROJ	6	0	0	12	12	90	60	150
Total					**12**	6	0	12	18			
***In case of semester long project work done in industry or internship, the OECs in VIII semester may be offered in online mode/NPTEL on SWAYAM.**				**Grand Total**	**163**							

Honours Degree in Nanoelectronics and VLSI Design

II Year											
S.No.	**Course No.**	**Course Name**	**Type ofCourse**	**Credits**	**Periods/ week**			**Hours**	**Examination Scheme (Distribution of Marks)**		
									Mid Semester Evaluation	**End Semester Evaluation**	**Total Marks**
					L	**T**	**P**		**CCA/MTE - 1/MTE-2**		
IV Semester											
THEORY											
1	ECH-411	VLSI technology/NEMS & MEMS	Theory	3	3	0	0	3	30	45	75
V Semester											
THEORY											
1	ECH-511	CMOS Digital VLSI Design	Theory	3	3	0	0	3	30	45	75
PRACTICAL (LAB.)											
I	ECL-521	CMOS Digital VLSI	Lab	1	0	0	2	2	15	10	25

		Design Lab.										
VI Semester												
THEORY												
1	ECH-611	CMOS Analog VLSI Design	Theory		3	3	0	0	3	30	45	75
PRACTICAL (LAB.)												
I	ECL-621	CMOS Analog VLSI Design Lab.	Lab		1	0	0	2	2	15	10	25
VII Semester												
THEORY												
1	ECH-711	CMOS Mixed-Signal VLSI Design	Theory		3	3	0	0	3	30	45	75
PRACTICAL (LAB.)												
I	ECL-721	CMOS Mixed-Signal VLSI Design Lab.	Lab		1	0	0	2	2	15	10	25
VII Semester												
THEORY												
1	ECH-811	Semiconductor Device Modeling	Theory		3	3	0	0	3	30	45	75
Total					**18**	15	0	6	21			

Minor Degree in Nanoelectronics and VLSI Design

II Year											
S.No.	Course No.	Course Name	Type ofCourse		Credits	Periods/ week			Hours	Examination Scheme (Distribution of Marks)		
										Mid Semester Evaluation	End Semester Evaluation	Total Marks
						L	T	P		CCA/MTE - 1/MTE-2		
IV Semester												
THEORY												
1	ECD-411	VLSI technology/NEMS & MEMS	Theory		3	3	0	0	3	30	45	75
V Semester												
THEORY												
1	ECD-511	CMOS Digital VLSI Design	Theory		3	3	0	0	3	30	45	75
PRACTICAL (LAB.)												
I	ECL-522	CMOS Digital VLSI Design Lab.	Lab		1	0	0	2	2	15	10	25
VI Semester												
THEORY												
1	ECD-611	CMOS Analog VLSI Design	Theory		3	3	0	0	3	30	45	75
PRACTICAL (LAB.)												
I	ECL-622	CMOS Analog VLSI Design Lab.	Lab		1	0	0	2	2	15	10	25

VII Semester												
THEORY												
1	ECD-711	CMOS Mixed-Signal VLSI Design	Theory		3	3	0	0	3	30	45	75
PRACTICAL (LAB.)												
I	ECL-722	CMOS Mixed-Signal VLSI Design Lab.	Lab		1	0	0	2	2	15	10	25
VII Semester												
THEORY												
1	ECD-811	Semiconductor Device Modeling	Theory		3	3	0	0	3	30	45	75
Total					**18**	15	0	6	21			