

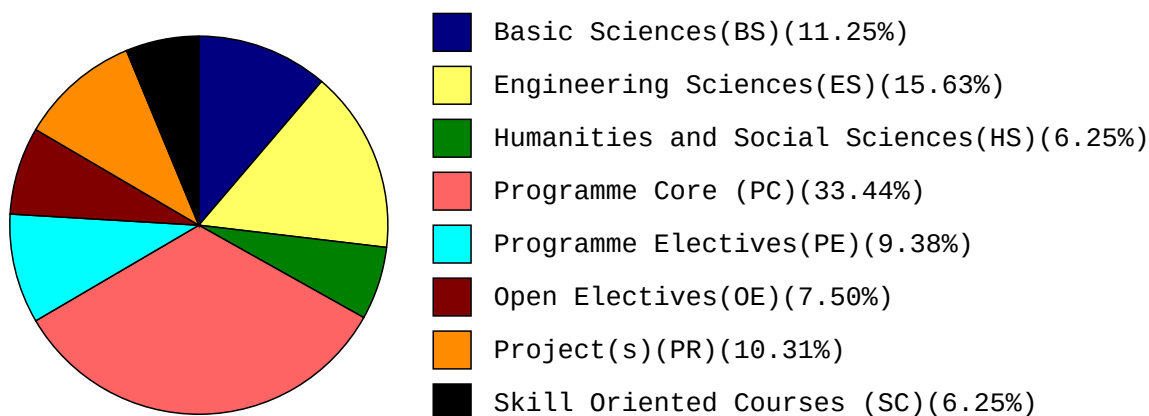
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

B.TECH. ELECTRONICS & COMMUNICATION ENGINEERING

(w.e.f. the batch of students admitted from the academic year 2020-2021)

Programme curriculum grouping based on course components

Course Component	Curriculum Content (% of total number of credits in programme)	Total number of contact hours	Total number of credits
Basic Sciences (BS)	11.25	21	18
Engineering Sciences (ES)	15.63	34	25
Humanities and / Social Sciences (HS)	6.25	11	10
Professional Core (PC)	33.44	66	53.5
Professional Electives (PE)	9.38	12	15
Open Electives (OE)	7.5	9	12
Project(s) (PR)	10.31		16.5
Skill Oriented Courses (SC)	6.25	15	10
Mandatory Course(s) (MC)	--	8	--
Total number of Credits			160



B.TECH. ELECTRONICS & COMMUNICATION ENGINEERING

(w.e.f. the batch of students admitted from the academic year 2020-2021)

Three Weeks Orientation Programme is Mandatory before starting Semester I [First Year]

Semester I [First Year]

COURSE STRUCTURE

SNo.	Course Details		Scheme of Instruction			Scheme of Examination			Category
	Code No.	Subject Name	Periods per week			Maximum Marks		Credits	Code
			L	T	P	SES	EXT		
1	EC111	Mathematics-I	2	1	-	30	70	3	BS
2	EC112	Engineering Physics	3	-	-	30	70	3	BS
3	EC113	English for Communication Skills	3	-	-	30	70	3	HS
4	EC114	Circuit Theory	2	1	-	30	70	3	ES
5	EC151	Engineering Physics Lab	-	-	3	30	70	1.5	BS
6	EC152	English Language Communication Skills Lab	-	-	2	30	70	1	HS
7	EC153	Engineering Workshop Practice Lab	1	-	4	30	70	3	ES
8	EC154	Introduction to Python Programming Lab	1	-	2	30	70	2	ES
9	ECMC1	Environmental Science	2	-	-	100	-	-	MC
TOTAL			14	2	11	340	560	19.5	TPW-27

Semester II [First Year]

COURSE STRUCTURE

SNo.	Course Details		Scheme of Instruction			Scheme of Examination			Category
	Code No.	Subject Name	Periods per week			Maximum Marks		Credits	Code
			L	T	P	SES	EXT		
1	EC121	Mathematics-II	2	1	-	30	70	3	BS
2	EC122	Engineering Chemistry	2	1	-	30	70	3	BS
3	EC123	Electronic Devices	3	-	-	30	70	3	ES
4	EC124	Programing for Problem Solving	3	-	-	30	70	3	ES
5	EC161	Engineering Chemistry Lab	-	-	3	30	70	1.5	BS
6	EC162	Programing for Problem Solving Lab	-	-	4	30	70	2	ES
7	EC163	Engineering Graphics & Design Lab	1	-	4	30	70	3	ES
8	EC164	Electronic Devices Lab	-	-	2	30	70	1	ES
9	ECMC2	Constitution of India	2	-	-	100	-	-	MC
TOTAL			13	2	13	340	560	19.5	TPW-28

Semester III [Second Year]

COURSE STRUCTURE

SNo.	Course Details		Scheme of Instruction			Scheme of Examination			Category
	Code No.	Subject Name	Periods per week			Maximum Marks		Credits	Code
			L	T	P	SES	EXT		
1	EC211	Mathematics-III	2	1	-	30	70	3	BS
2	EC212	Data Structures using Python	3	1	-	30	70	4	ES
3	EC213	Digital Electronics & Logic Design	3	-	-	30	70	3	PC
4	EC214	Signals & Systems	2	1	-	30	70	3	PC
5	EC215	Analog Circuits	3	-	-	30	70	3	PC
6	EC251	Data Structures using Python Lab	-	-	2	30	70	1	ES
7	EC252	Digital Electronics & Logic Design Lab	-	-	3	30	70	1.5	PC
8	EC253	Signals & Systems Lab	-	-	2	30	70	1	PC
9	ECSL1	Skill Oriented Course-I	1	-	2	100	-	2	SC
10	ECMC3	Ethics & Human Values	2	-	-	100	-	-	MC
TOTAL			16	3	9	440	560	21.5	TPW-28

Semester IV [Second Year]**COURSE STRUCTURE**

SNo.	Course Details		Scheme of Instruction			Scheme of Examination		Credits	Category
	Code No.	Subject Name	Periods per week			Maximum Marks	Code		
			L	T	P				SES
1	EC221	Electromagnetic Fields & Transmission Lines	3	-	-	30	70	3	PC
2	EC222	Analog Communication	3	-	-	30	70	3	PC
3	EC223	Digital Signal Processing	3	1	-	30	70	4	PC
4	EC224	Microprocessor & Microcontroller	2	1	-	30	70	3	PC
5	EC225	Economics for Engineers	3	-	-	30	70	3	HS
6	EC261	Analog Circuits Lab	-	-	3	30	70	1.5	PC
7	EC262	Digital Signal Processing Lab	-	-	2	30	70	1	PC
8	EC263	Microprocessor & Microcontroller Lab	-	-	2	30	70	1	PC
9	ECSL2	Skill Oriented Course-II	1	-	2	100	-	2	SC
10	ECMC4	Design Thinking & Product Innovation	2	-	-	100	-	-	MC
TOTAL			17	2	9	440	560	21.5	TPW-28
Internship 3 to 4 weeks (minimum 3 weeks-Mandatory) during summer vacation (to be evaluated during next semester)									
Honors/Minor course (Maximum Two courses can be registered)			4	-	-	30	70	4	HR/MR

Semester V [Third Year]**COURSE STRUCTURE**

SNo.	Course Details		Scheme of Instruction			Scheme of Examination			Category
	Code No.	Subject Name	Periods per week			Maximum Marks		Credits	Code
			L	T	P	SES	EXT		
1	EC311	Antennas & Wave Propagation	3	-	-	30	70	3	PC
2	EC312	VLSI Design	3	-	-	30	70	3	PC
3	EC313	Digital Communication	3	-	-	30	70	3	PC
4	EC314	Professional Elective-I	3	-	-	30	70	3	PE
5	EC315	Open / Job-Oriented Elective-I	3	-	-	30	70	3	OE
6	EC351	Analog & Digital Communication Lab	-	-	3	30	70	1.5	PC
7	EC352	HDL Programming Lab	1	-	2	30	70	2	PC
8	EC353	Summer Internship	-	-	-	100	-	1.5	PR
9	ECSL3	Skill Oriented Course-III	1	-	2	100	-	2	SC
TOTAL			17	0	7	410	490	22	TPW-24
Honors/Minor course (Maximum Two courses can be registered)			4	-	-	30	70	4	HR/MR

Semester VI [Third Year]**COURSE STRUCTURE**

SNo.	Course Details		Scheme of Instruction			Scheme of Examination			Category
	Code No.	Subject Name	Periods per week			Maximum Marks		Credits	Code
			L	T	P	SES	EXT		
1	EC321	Integrated Circuits & Applications	3	-	-	30	70	3	PC
2	EC322	Microwave Engineering	3	-	-	30	70	3	PC
3	EC323	Digital Image Processing	3	-	-	30	70	3	PC
4	EC324	Professional Elective-II	3	-	-	30	70	3	PE
5	EC325	Open / Job-Oriented Elective-II	3	-	-	30	70	3	OE
6	EC361	Integrated Circuits & Applications Lab	-	-	3	30	70	1.5	PC
7	EC362	Advanced Communication Lab	-	-	3	30	70	1.5	PC
8	EC363	Embedded Systems Lab	-	-	2	30	70	1	PC
9	ECSL4	Skill Oriented Course-IV	1	-	2	100	-	2	SC
TOTAL			16	0	10	340	560	21	TPW-26
Internship 6 to 8 weeks (minimum 6 weeks-Mandatory) during summer vacation (to be evaluated during next semester)									
Honors/Minor course (Maximum Two courses can be registered)			4	-	-	30	70	4	HR/MR

Semester VII [Fourth Year]**COURSE STRUCTURE**

SNo.	Course Details		Scheme of Instruction			Scheme of Examination			Category
	Code No.	Subject Name	Periods per week			Maximum Marks		Credits	Code
			L	T	P	SES	EXT		
1	EC411	Humanities Elective	3	-	-	30	70	3	HE
2	EC412	Professional Elective-III	3	-	-	30	70	3	PE
3	EC413	Professional Elective-IV	3	-	-	30	70	3	PE
4	EC414	Professional Elective-V (MOOC)	-	-	-	-	100	3	PE
5	EC415	Open / Job-Oriented Elective-III	3	-	-	30	70	3	OE
6	EC416	Open / Job-Oriented Elective-IV (MOOC)	-	-	-	-	100	3	OE
7	EC451	Internship / Certification	-	-	-	100	-	3	PR
8	ECSL5	Skill Oriented Course-V	1	-	2	100	-	2	SC
TOTAL			13	0	2	320	480	23	TPW-15
Honors/Minor course (Maximum Two courses can be registered)			4	-	-	30	70	4	HR/MR

Semester VIII [Fourth Year]**COURSE STRUCTURE**

SNo.	Course Details		Scheme of Instruction			Scheme of Examination		Category Code	
	Code No.	Subject Name	Periods per week			Maximum Marks			Credits
			L	T	P	SES	EXT		
1	EC461	Project Work, Seminar and Internship in Industry	-	-	-	30	70	12	PR
TOTAL			0	0	0	30	70	12	TPW-0

Professional Elective Courses

Code No.	Subject Name	Code No.	Subject Name
ECEL01	Information Theory & Coding	ECEL02	Data Communication & Networking
ECEL03	Optical Communication	ECEL04	Cellular & Mobile Communication
ECEL05	Embedded Systems	ECEL06	Digital System Design
ECEL07	Linear Control Systems	ECEL08	MEMS
ECEL09	Radar & Navigational Aids	ECEL10	Electronic Measurements & Instrumentation
ECEL11	Cognitive Radio	ECEL12	Wireless Sensor Networks
ECEL13	Computer System Architecture	ECEL14	Electromagnetic Interference & Compatibility
ECEL15	Pattern Recognition	ECEL16	Speech Processing
ECEL17	Artificial Neural Networks		

Skill Courses

Code No.	Subject Name	Code No.	Subject Name
ECSL-A	Graphical System Design	ECSL-B	Virtual Instrumentation
ECSL-C	Keil - Embedded Simulator Software	ECSL-D	Soft Skills
ECSL-E	LTspice - Circuit Simulator Software		

Science & Humanities Elective Courses

Code No.	Subject Name	Code No.	Subject Name
HSEL1	Industrial Management & Entrepreneurship	HSEL2	Economics for Engineers
HSEL3	Introduction to Industrial Management	HSEL4	Project Management & Entrepreneurship

Honors Courses

- Note :**
1. The subjects opted for Honors should be Advanced type which are not covered in regular curriculum
 2. Students has to acquire 16 credits with minimum one subject from each pool.
 3. Compulsory MOOC/NPTEL Courses for 04 credits (02 courses@ 2 credits each)

Pool 1

Code No.	Subject Name	Code No.	Subject Name
ECH11	Advanced Embedded Systems	ECH12	Advanced Digital Signal Processing
ECH13	Digital Image & Video Processing	ECH14	Wireless Broadband Communications

Pool 2

Code No.	Subject Name	Code No.	Subject Name
ECH21	Non-Linear Optical Communication	ECH22	Satellite Communication
ECH23	Advanced VLSI	ECH24	Internet of Things

Pool 3

Code No.	Subject Name	Code No.	Subject Name
ECH31	Radar Engineering	ECH32	Wireless Communications
ECH33	Advanced Wireless Broadband Communications	ECH34	Optical Networks

Pool 4

Code No.	Subject Name	Code No.	Subject Name
ECH41	Multicarrier Communication Systems	ECH42	Nano Electronics
ECH43	RF and Mixed Signals Circuits	ECH44	Microelectronic Devices, Technology and Circuits

Open Elective Courses (Offered by other Departments)

Code No.	Subject Name	Code No.	Subject Name
CBOL1	Operating Systems Concepts	CBOL2	Business Analytics
CDOL1	Python for Data Science	CDOL2	Data Science for Engineers
CEOL1	Basic Surveying	CEOL2	Building Materials and Construction
CHOL1	Energy Engineering	CHOL2	Solid Waste Management
CMOL1	Fundamentals of Artificial Intelligence	CMOL2	Programming with C++
COOL1	Fundamentals of IoT	COOL2	IoT Architecture and Protocols
CSOL1	Programming with JAVA	CSOL2	Relational DataBase Management System
EEOL1	Renewable Energy Sources	EEOL2	Utilization of Electrical Energy
ITOL1	Data Structures and Algorithms	ITOL2	Web Technologies
MEOL1	Operations Research	MEOL2	Applied Mechanics & Mechanical Engineering

Job Oriented Elective Courses

Code No.	Subject Name	Code No.	Subject Name
JOEL01	Big Data Processing	JOEL02	Full Stack Development
JOEL03	JavaScript Technologies	JOEL04	Cloud Computing using AWS/Azure
JOEL05	DevOps	JOEL07	Tableau Software
JOEL08	Python for Data Science	JOEL09	Interface and Programming With IoT Gateway
JOEL10	IoT Cloud and Data Analytics	JOEL11	Geospatial Technology
JOEL12	Building Planning	JOEL13	Quantity Estimation
JOEL14	Bio Fuels	JOEL15	Environmental Engineering
JOEL16	Safety Management	JOEL17	Non-Conventional Energy Engineering
JOEL18	Biopharmaceutics and Drug design	JOEL19	Embedded Systems-1
JOEL20	Embedded Systems-2	JOEL21	Open Source Systems
JOEL22	Machine Learning	JOEL23	Valuation of Property
JOEL24	Artificial Intelligence		

General Minor Courses (Offered by other Department)

Note : 1. A student can opt any 4 subjects from each pool @ 4 credits per subject.
2. Compulsory MOOC/NPTEL Courses for 04 credits (02 courses@ 2 credits each)

Offered by Civil Engineering

Code No.	Subject Name	Code No.	Subject Name
CEMR1	Geomatics (Survey, GIS & GPS)	CEMR2	Construction Engineering & Management
CEMR3	Fundamentals of Structural Engineering	CEMR4	Water Resource Engineering
CEMR5	Environmental Engineering	CEMR6	Geotechnical Engineering
CEMR7	Transportation Engineering		

Offered by Chemical Engineering

Code No.	Subject Name	Code No.	Subject Name
CHMR1	Unit Operations	CHMR2	Principles of Chemical Process Calculations
CHMR3	Transfer operations	CHMR4	Reaction Engineering
CHMR5	Industrial Pollution Control Engineering	CHMR6	Principles of Safety Management

Offered by Computer Science & Engineering

Code No.	Subject Name	Code No.	Subject Name
CSMR1	Fundamentals of Data Structures	CSMR2	Computer Organization and Architecture
CSMR3	Operating System Concepts	CSMR4	Relational DataBase Management System
CSMR5	Programming with JAVA	CSMR6	Introduction to Algorithms
CSMR7	Principles of Software Engineering	CSMR8	Computer Networking Concepts

Offered by Computer Science & Engineering (DS)

Code No.	Subject Name	Code No.	Subject Name
CDMR1	Introduction to Data Science & Machine Learning	CDMR2	Analysing, Visualizing and Applying Data Science with Python
CDMR3	Web Data Mining	CDMR4	Business Analytics
CDMR5	Data Science for Engineers	CDMR6	Deep Learning

Offered by Computer Science & Engineering (AIML)

Code No.	Subject Name	Code No.	Subject Name
CMMR1	Introduction to Artificial Intelligence	CMMR2	Machine Learning
CMMR3	Data Analytics	CMMR4	Deep Learning
CMMR5	Natural Language Processing	CMMR6	Soft Computing

Offered by Computer Science & Engineering (IoT)

Code No.	Subject Name	Code No.	Subject Name
COMR1	Introduction to Internet of Things	COMR2	IoT Architecture and Protocols
COMR3	IoT Cloud and Data Analytics	COMR4	Smart Sensor Technologies
COMR5	Fundamental of IoT	COMR6	Introduction of Raspberry Pi and Arduino

Offered by Information Technology

Code No.	Subject Name	Code No.	Subject Name
ITMR1	Database Management Systems	ITMR2	Unix and Shell Programming
ITMR3	Computer Networks	ITMR4	Software Engineering
ITMR5	Cryptography and Network Security	ITMR6	Machine Learning

Offered by Electrical & Electronics Engineering

Code No.	Subject Name	Code No.	Subject Name
EEMR1	Electrical Machines Theory & Performance	EEMR2	Electrical Power Generation & Utilization
EEMR3	Power Systems Engineering	EEMR4	Power Converters & Applications
EEMR5	Electrical Measurements & Instrumentation	EEMR6	Electric Vehicles

Offered by Mechanical Engineering

Code No.	Subject Name	Code No.	Subject Name
MEMR1	Engineering Mechanics	MEMR2	Strength of Materials and Fluid mechanics
MEMR3	Manufacturing Processes	MEMR4	Concepts of Thermal Engineering
MEMR5	Concepts of Mechanical Design	MEMR6	Computer Aided Design & Manufacturing
MEMR7	Additive Manufacturing		

General Minor Courses (Offered by other Department)

- Note : 1. A student can opt any 4 subjects from each pool @ 4 credits per subject.
2. Compulsory MOOC/NPTEL Courses for 04 credits (02 courses@ 2 credits each)

Industry Track - Minor Courses

- Note : 1. A student can opt any 4 subjects from each Track @ 4 credits per subject.
2. Compulsory MOOC/NPTEL Courses for 04 credits (02 courses@ 2 credits each)

Minor in Industrial Automation & Robotics (Offered by Mechanical Engineering)

Code No.	Subject Name	Code No.	Subject Name
ARMR1	Robotic Engineering	ARMR2	Mechatronics and Microcontrollers
ARMR3	Industrial Automation	ARMR4	Computer integrated Manufacturing
ARMR5	Fluidics and Control Systems	ARMR6	Mechanics of Robots

Minor in Full Stack Development (Offered by Computer Science & Business Systems)

Code No.	Subject Name	Code No.	Subject Name
FSMR1	User Interface Design	FSMR2	Client Side Scripting
FSMR3	React JS	FSMR4	MEAN stack (MongoDB, Express JS, Angular JS, Node JS)
FSMR5	C# (.NET Framework)	FSMR6	Web Application Development Using ASP

Minor in Cloud Computing (Offered by Computer Science & Engineering - Data Science)

Code No.	Subject Name	Code No.	Subject Name
CCMR1	Principals of Cloud Computing	CCMR2	Cloud Virtualization
CCMR3	Cloud Application Development	CCMR4	Cloud Security
CCMR5	Edge Computing	CCMR6	Block Chain Security

Minor in VLSI (Offered by Electronics & Communication Engineering)

Code No.	Subject Name	Code No.	Subject Name
VLMR1	HDL Programming	VLMR2	System Verilog and UVM
VLMR3	Physical Design Fundamentals	VLMR4	Low Power VLSI Design
VLMR5	Synthesis and Formal Verification	VLMR6	Advanced Physical Design

Minor in Electric Vehicles (Offered by Electrical & Electronics Engineering)

Code No.	Subject Name	Code No.	Subject Name
EVMR1	Energy Systems and Electrical Machines	EVMR2	Hybrid Electric Vehicles
EVMR3	Plug-in Electric vehicles	EVMR4	Electric Vehicle Power Train
EVMR5	Autotronics	EVMR6	BMS & Charging stations