B. Tech (Regular-Full time)

Electronics and Communication Engineering

B.TECH. - COURSE STRUCTURE – R23
(Applicable from the academic year 2023-24 onwards)

INDUCTION PROGRAMME

S.No.	Course Name	Category	L-T-P-C
1	Physical Activities -- Sports, Yoga and Meditation, Plantation	MC	0-0-6-0
2	Career Counseling	MC	2-0-2-0
3	Orientation to all branches -- career options, tools, etc.	MC	3-0-0-0
4	Orientation on admitted Branch -- corresponding labs, tools and platforms	EC	2-0-3-0
5	Proficiency Modules & Productivity Tools	ES	2-1-2-0
6	Assessment on basic aptitude and mathematical skills	MC	2-0-3-0
7	Remedial Training in Foundation Courses	MC	2-1-2-0
8	Human Values & Professional Ethics	MC	3-0-0-0
9	Communication Skills -- focus on Listening, Speaking, Reading, Writing skills	BS	2-1-2-0
10	Concepts of Programming	ES	2-0-2-0

Department of Electronics and Communication Engineering

COURSE STRUCTURE
(Applicable from the academic year 2023-24 onwards)

S.No.	Course Code	Course Name	L	T	P	Credits
I Year I Semester						
1.	R23BS01	Linear Algebra & Calculus	3	0	0	3
2.	R23BS04	Chemistry	3	0	0	3
3.	R23ES07	Introduction to Programming	3	0	0	3
4.	R23ES03	Engineering Graphics	1	0	4	3
5.	R23ES04	Basic Electrical & Electronics Engineering	3	0	0	3
6.	R23BS04	Chemistry Lab	0	0	2	1
7.	R23ES07	Computer Programming Lab	0	0	3	1.5
8.	R23ES05	Electrical &Electronics Engineering Workshop	0	0	3	1.5
9.	R23MC02	NSS/NCC/Scouts &Guides/Community Service	0	0	1	0.5
		Total				**19.5**

S.No.	Course Code	Course Name	L	T	P	Credits
I Year II Semester						
1.	R23BS02	Differential Equations and Vector Calculus	3	0	0	3
2.	R23BS03	Engineering Physics	3	0	0	3
3.	R23HS01	Communicative English	2	0	0	2
4.	R23ES01	Basic Civil & Mechanical Engineering	3	0	0	3
5.	R23PC01	Network Analysis	3	0	0	3
6.	R23HS01	Communicative English Lab	0	0	2	1
7.	R23BS03	Engineering Physics Lab	0	0	2	1
8.	R23ES06	IT workshop	0	0	2	1
9.	R23ES02	Engineering Workshop	0	0	3	1.5
10.	R23PC01	Network Analysis and Simulation Laboratory	0	0	3	1.5
11.	R23MC01	Health and Wellness, Yoga and Sports	0	0	1	0.5
		Total				**20.5**

B.Tech.– II Year I Semester

S. No	Category	Title	L	T	P	Credits
1	BS	Random Variables and Stochastic	3	0	0	3
2	HSMC	Universal Human Values– Understanding Harmony and Ethical Human Conduct	2	1	0	3
3	ES	Signals and Systems	3	0	0	3
4	PCC	Electronic Devices and Circuits	3	0	0	3
5	PCC	Digital Circuits Design	3	0	0	3
6	PCC	Electronic Devices and Circuits Lab	0	0	3	1.5
7	PCC	Digital Design & Signal Simulation lab	0	0	3	1.5
8	SEC	Python Programming	0	1	2	2
9	Audit Course	Environmental Science	2	0	0	-
		Total	**16**	**02**	**08**	**20**

B.Tech.– II Year II Semester

S. No	Category	Title	L	T	P	Credits
1	HSMC	Managerial Economics and Financial Analysis	2	0	0	2
2	ES	Linear Control Systems	3	0	0	3
3	PCC	EM Waves and Transmission Lines	3	0	0	3
4	PCC	Analog Circuits Design	3	0	0	3
5	PCC	Analog and Digital Communications	3	0	0	3
6	PCC	Analog Circuits Design Lab	0	0	3	1.5
7	PCC	Analog and Digital Communications	0	0	3	1.5
8	SEC	Soft Skills	0	1	2	2
9	ES	Design Thinking and Innovation	1	0	2	2
		Total	**15**	**01**	**10**	**21**

B.Tech. – III Year I Semester

S.No	Category	Course Code	Title	L	T	P	C
1	PC	R2331041	Microprocessors and Microcontrollers	3	0	0	3
2	PC	R2331042	Information Theory and Error Control Coding	3	0	0	3
3	PC	R2331043	Digital Signal Processing	3	0	0	3
4	PCE-1	R2331044A	Computer Architecture & Organization	3	0	0	3
		R2331044B	Antenna Analysis and Design				
		R2331044C	Electronic Measurements and Instrumentation				
5	OE-1	R2331045A	Global Navigation Satellite Systems	3	0	0	3
		R2331045B	Internet of Things				
		R2331045C	Communication Systems				
6	PC Lab-1	R2331046	Microprocessors and Microcontrollers Lab	0	0	3	1.5
7	PC Lab-2	R2331047	Digital Signal Processing Lab	0	0	3	1.5
8	SEC	R233104SC	Data Structures with Python	0	1	2	2
9	ES	R233104ES	PCB Design Practice	0	0	3	1.5
10	Internship		Evaluation of Community Service Internship	0	0	0	1
11	MC	R233104MC	Constitution of India	2	0	0	0
Total				**17**	**1**	**11**	**22.5**

B.Tech. – III Year II Semester

S.No	Category	Course Code	Title	L	T	P	C
1	PC	R2332041	VLSI Design	3	0	0	3
2	PC	R2332042	Advanced Digital Communications	3	0	0	3
3	PC	R2332043	Communication Networks	3	0	0	3
4	PE - II	R2332044A	DSP Processors and Architectures	3	0	0	3
		R2332044B	Biomedical Signal Processing				
		R2332044C	Neural Networks				
5	PE - III	R2332045A	Optimization Techniques	3	0	0	3
		R2332045B	Mobile and Cellular Communication				
		R2332045C	Artificial Intelligence				
6	OE - II	R2332046A	Machine Learning- Chip Design	3	0	0	3
		R2332046B	Block chain Technologies				
		R2332046C	Drone Technology				
7	PC Lab-1	R2332047	VLSI Design Lab (with FPGA Implementation)	0	0	3	1.5
8	PC Lab-2	R2332048	Advanced Digital Communications Lab	0	0	3	1.5
9	SEC	R233204SC	Hardware Modelling with HDL's	0	1	3	1.5
10	AC	R233204AC	Technical Paper Writing & IPR	2	0	0	0
Total				**20**	**1**	**9**	**22.5**
Mandatory Industry Internship of 08 weeks duration during summer vacation							

B.Tech. – IV Year I Semester

S.No	Category	Course Code	Title	L	T	P	C
1	PC	R2341041	Microwave Engineering & Optical Communications	3	0	0	3
2	PC	R2341042	Digital Image and Video Processing	3	0	0	3
3	Management Course-II	R2341043	E–Waste Management	2	0	0	2
4	PE – IV	R2341044A	RADAR Engineering	3	0	0	3
		R2341044B	Low Power VLSI				
		R2341044C	Spectrum Sensing				
5	PE - V	R2341045A	Speech Signal Processing	3	0	0	3
		R2341045B	Wireless Sensor Networks & IoT Applications				
		R2341045V	Embedded System Design				
6	OE - III	R2341046A	Data Networks & Protocols	3	0	0	3
		R2341046B	Cryptography and Network Security				
		R2341046C	Soft Computing Techniques				
7	PC Lab-1	R2341047	Microwave Engineering & Optical Communications Lab	0	0	3	1.5
8	PC Lab-2	R2341048	Digital Image and Video Processing Lab	0	0	3	1.5
9	SEC	R234104SC	Machine Learning Lab	0	1	2	2
10	AC	R234104AC	Value Education	2	0	0	0
			Total	**19**	**1**	**8**	**22**

B.Tech. – IV Year II Semester

S.No	Category	Course Code	Title	L	T	P	C
1	PC	R2342041	IOT Architecture and Protocols	**3**	**0**	**0**	**3**
2	Internship		Online Internship	**0**	**0**	**6**	**3**
3	Project		Project Work (Offline)	**0**	**0**	**12**	**6**
			Total	**3**	**0**	**18**	**12**

List of Domains for Honours:

Honor Degree in Electronics and Communication Engineering

Note: A student must acquire additional 18 credits and out of which at least 6 credits (i.e., 2 Courses of 3 Credits each) must be earned from NPTEL/SWAYAM MOOC Courses
(As per Proc.NoE1/JNTUGV/DAP/Guidelines for B.Tech Honors/2025 Dt: 20-02-2025)

(I) VLSI Circuit Design and Verification

S.No	Course Code	Subject Title	L	T	P	C
1	R234HO01	CMOS Logic Circuit Design	3	0	0	3
2	R234HO02	System on Chip Design	3	0	0	3
3	R234HO03	VLSI Fabrication Technology	3	0	0	3
4	R234HO04	Advanced VLSI Design	3	0	0	3
5	R234HO05	Introduction to CAD for VLSI	3	0	0	3
					Total	15

(II) Robotics and Automation

S.No	Course Code	Subject Title	L	T	P	C
1	R234HO06	Industrial Automation	3	0	0	3
2	R234HO07	Robots and Control	3	0	0	3
3	R234HO08	Distributed Embedded systems	3	0	0	3
4	R234HO09	Advanced Controllers	3	0	0	3
5	R234HO10	Industrial Automation	3	0	0	3
					Total	15

(III) Cognitive Radio Networks

S.No	Course Code	Subject Title	L	T	P	C
1	R234HO11	Optical Communications	3	0	0	3
2	R234HO12	Wireless and Mobile Networks	3	0	0	3
3	R234HO13	Software Defined Radio	3	0	0	3
4	R234HO14	MIMO Wireless Communications	3	0	0	3
5	R234HO15	Wireless broad band communications	3	0	0	3
					Total	15

(IV) Multimedia Signal Processing

S.No	Course Code	Subject Title	L	T	P	C
1	R234HO16	Detection & Estimation of Signals (DES)	3	0	0	3
2	R234HO17	Statistical Signal Processing	3	0	0	3
3	R234HO18	Computer Vision	3	0	0	3
4	R234HO19	Audio Signal Processing	3	0	0	3
5	R234HO20	Detection & Estimation of Signals (DES)	3	0	0	3
					Total	15

Suggested NPTEL Courses:

1. Microelectronics: Devices to Circuits (Source: IIT Kanpur & NPTEL via SWAYAM)

2. Integrated Photonics Devices and Circuits (Source: IIT Madras & NPTEL via SWAYAM)

3. Mathematical Aspects of Biomedical Electronic System Design (Source: IISc Bangalore & NPTEL via SWAYAM)

4. Signal Processing for mm Wave communication for 5G and beyond (Source: IIT Kharagpur & NPTEL via SWAYAM) MOOCS - 2

5. Deep Learning for Computer Vision (Source: NPTEL)

6. Big Data Computing (Source: IIT Patna & NPTEL via SWAYAM)

7. Fabrication Techniques for MEMS-based sensors: clinical perspective (Source: IISc Bangalore & NPTEL via SWAYAM)

8. Introduction to Industry 4.0 and Industrial Internet of Things (Source: IIT Kharagpur & NPTEL via SWAYAM)

Minors offered by ECE department to Other Branches

Electronics and Communications Engineering (All branches)

Note: A student must acquire additional 18 credits, for the award of Minor by fulfilling at least 3 credits must be earned from NPTEL/SWAYAM MOOC Courses
(As per Proc.NoE1/JNTUGV/DAP/Guidelines for B.Tech Minors/2025 Dt: 20-02-2025)

S.No	Course Code	Subject Title	L	T	P	C
1	R234MI01	Electronic Devices and Linear ICs	3	0	0	3
2	R234MI02	Fundamentals of Digital Signal Processing	3	0	0	3
3	R234MI03	Fundamentals of VLSI Design	3	0	0	3
4	R234MI04	Digital Design with Verilog	3	0	0	3
5	R234MI05	Principles of Communications	3	0	0	3
6	R234MI06	Quantum Communications	3	0	0	3
7	R234MI07	VLSI Design Flow: RTL to GDS	3	0	0	3
8	R234MI08	Microcontrollers and Interfacing	3	0	0	3
9	R234MI09	Sensors and Data Acquisition System	3	0	0	3
10	R234MI10	Fundamentals of Lab view	3	0	0	3
11	R234MI11	Medical Robotics	3	0	0	3
12	R234MI12	Coding Theory and Practice	3	0	0	3
13	R234MI13	Ad-hoc and Wireless Sensor Networks	3	0	0	3
14	R234MI14	Fundamentals of Multimedia Networking	3	0	0	3
15	R234MI15	Geographic Information Systems	3	0	0	3
16	R234MI16	Digital Image Processing	3	0	0	3