R.V.R & J.C.COLLEGE OF ENGINEERING (Autonomous)

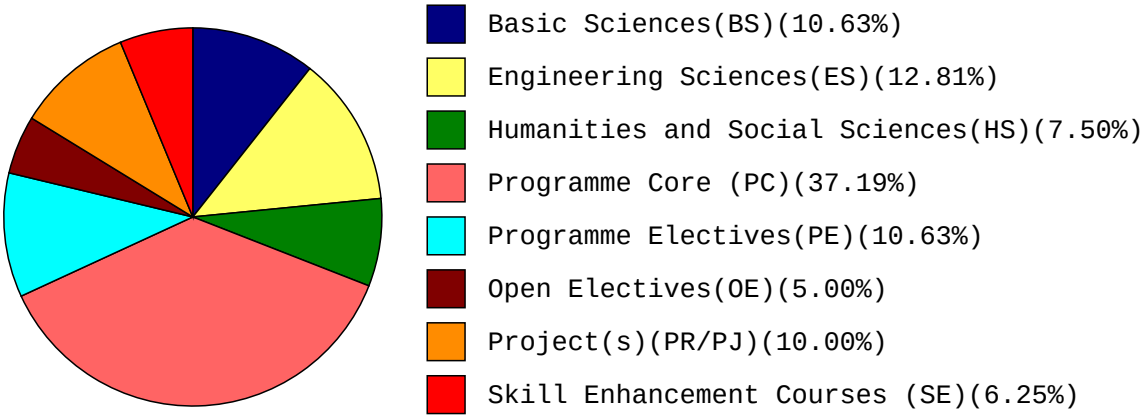
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

B.TECH. ELECTRONICS & COMMUNICATION ENGINEERING

(w.e.f. the batch of students admitted from the academic year 2024-2025)

Programme curriculum (R24) 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)	10.63	19	17
Engineering Sciences (ES)	12.81	28	20.5
Humanities and / Social Sciences (HS)	7.5	16	12
Professional Core (PC)	37.19	71	59.5
Professional Elective(s) (PE)	10.63	15	17
Open Elective(s) (OE)	5	6	8
Project(s) (PR/PJ)	10	26	16
Skill Enhancement Course(s) (SEC)	6.25	17	10
Mandatory Course(s) (MC)	--	6	--
Total number of Credits			160



R.V.R & J.C.COLLEGE OF ENGINEERING (Autonomous)

B.TECH. ELECTRONICS & COMMUNICATION ENGINEERING

Course Structure, Scheme of Instruction (R24) and Examination

(w.e.f. the batch of students admitted from the academic year 2024-2025)

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
	Code No.	Subject Name	Periods per week			Maximum Marks		Credits	
			L	T	P	SES	EXT		
1	EC/EE111	Linear Algebra and Calculus	2	1	-	30	70	3.0	BS
2	EC/CM/EE112	Chemistry for Engineers	3	-	-	30	70	3.0	BS
3	EC/CE/CH/ EE/ME113	Basic Civil and Mechanical Engineering	3	-	-	30	70	3.0	ES
4	EC/CD/CM/ CO/CS/IT114	Programming for Problem Solving	4	-	-	30	70	4.0	ES
5	EC/CE/CH/ EE/ME115	Communicative English	2	-	-	30	70	2.0	HS
6	EC151	Chemistry Lab	-	-	2	30	70	1.0	BS
7	EC152	Communicative English Lab	-	-	2	30	70	1.0	HS
8	EC153	Programming for Problem Solving Lab	-	-	3	30	70	1.5	ES
9	EC/CE/CH/ CM/EE/ME154	Health and Wellness, Yoga and Sports	-	-	1	30	70	0.5	HS
		TOTAL	**14**	**1**	**8**	270	630	**19**	TPW-23

Semester II [First 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	EC/EE121	Differential Equations, Transforms and Vector Calculus	2	1	-	30	70	3.0	BS
2	EC/EE/ME122	Engineering Physics	3	-	-	30	70	3.0	BS
3	EC/EE123	Programming With Python	2	-	-	30	70	2.0	ES
4	EC124	Basic Electrical Circuits and Electronic Devices	4	-	-	30	70	4.0	PC
5	EC161	Engineering Physics Lab	-	-	2	30	70	1.0	BS
6	EC162	Programming With Python Lab	-	-	3	30	70	1.5	ES
7	EC163	Basic Electrical Circuits and Electronic Devices Lab	-	-	3	30	70	1.5	PC
8	EC/CE/CH/ EE/ME164	Engineering Workshop	-	-	3	30	70	1.5	ES
9	EC/CH/EE165	Engineering Graphics	1	-	4	30	70	3.0	ES
10	EC/CE/CH/ CM/EE/ME166	NSS / NCC / Community Service	-	-	1	30	70	0.5	HS
		TOTAL	**12**	**1**	**16**	300	700	**21**	TPW-29

Semester III [Second 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	EC/CE/EE211	Numerical Methods, Probability and Statistics	2	1	-	30	70	3.0	BS
2	EC/EE212	Data Structures using Python	2	1	-	30	70	3.0	ES
3	EC213	Digital Electronics and Logic Design	3	-	-	30	70	3.0	PC
4	EC214	Signals and Systems	2	1	-	30	70	3.0	PC
5	EC215	Analog Circuits	3	-	-	30	70	3.0	PC
6	EC251	Skill Enhancement Course-1	-	-	4	30	70	2.0	SEC
7	EC/CE/CH/ EE/ME252	Design Thinking and Innovation	1	-	2	30	70	2.0	HS
8	EC253	Data Structures using Python Lab	-	-	2	30	70	1.0	ES
9	EC254	Digital Electronics and Logic Design Lab	-	-	3	30	70	1.5	PC
10	MC2	Environmental Science	2	-	-	100	-	0.0	MC
		TOTAL	**15**	**3**	**11**	370	630	**21.5**	TPW-29

Semester IV [Second 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	EC221	Electronic Circuit Analysis	2	-	-	30	70	2.0	PC
2	EC/CE/CH/ EE/ME222	Universal Human Values-II Understanding Harmony	2	-	-	30	70	2.0	HS
3	EC223	Digital Signal Processing	3	-	-	30	70	3.0	PC
4	EC224	Microcontrollers	3	-	-	30	70	3.0	PC
5	EC225	Analog Communication	3	-	-	30	70	3.0	PC
6	EC226	Electromagnetic Fields and Transmission Lines	3	-	-	30	70	3.0	PC
7	EC261	Skill Enhancement Course-2	-	-	4	30	70	2.0	SEC
8	EC262	Analog Circuits Lab	-	-	3	30	70	1.5	PC
9	EC263	Digital Signal Processing Lab	-	-	2	30	70	1.0	PC
10	MC1	Constitution of India	2	-	-	100	-	0.0	MC
		TOTAL	**18**	**0**	**9**	370	630	**20.5**	TPW-27
Internship 2 weeks (Mandatory) during summer vacation (to be evaluated during next semester)									
Honors/Minor course (Maximum Two courses can be registered)			**3**	**-**	**-**	**30**	**70**	**3**	HR/MR

Semester V [Third 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	EC311	Digital Communication	3	-	-	30	70	3.0	PC
2	EC312	VLSI Design	3	-	-	30	70	3.0	PC
3	EC313	Professional Elective-I	3	-	-	30	70	3.0	PE
4	EC314	Professional Elective-II	3	-	-	30	70	3.0	PE
5	EC315	Open Elective-I	3	-	-	30	70	3.0	OE
6	EC351	Skill Enhancement Course-3	-	1	2	30	70	2.0	SEC
7	EC352	Summer Internship-1	-	-	-	30	70	1.0	PR
8	EC353	Tinkering Lab	-	-	2	30	70	1.0	HS
9	EC354	Analog and Digital Communication Lab	-	-	2	30	70	1.0	PC
10	EC355	Embedded Systems Lab	-	-	2	30	70	1.0	PC
		TOTAL	**15**	**1**	**8**	300	700	**21**	TPW-24
Honors/Minor course (Maximum Two courses can be registered)			**3**	**-**	**-**	**30**	**70**	**3**	HR/MR

Semester VI [Third 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	EC321	Integrated Circuits and Applications	3	-	-	30	70	3.0	PC
2	EC322	Antennas and Wave Propagation	3	-	-	30	70	3.0	PC
3	EC323	Digital Image Processing	3	-	-	30	70	3.0	PC
4	EC324	Professional Elective-III	3	-	-	30	70	3.0	PE
5	EC325	Professional Elective-IV	3	-	-	30	70	3.0	PE
6	EC326	Open Elective-II	3	-	-	30	70	3.0	OE
7	EC361	Skill Enhancement Course-4	-	1	2	30	70	2.0	SEC
8	EC362	IC Applications Lab	-	-	3	30	70	1.5	PC
9	EC363	HDL Programming Lab	-	-	3	30	70	1.5	PC
10	MC3	Technical Paper Writing and IPR	-	-	2	100	-	0.0	MC
		TOTAL	**18**	**1**	**10**	370	630	**23**	TPW-29
Internship 4 weeks (Mandatory) during summer vacation (to be evaluated during next semester)									
Honors/Minor course (Maximum Two courses can be registered)			**3**	**-**	**-**	**30**	**70**	**3**	HR/MR

Semester VII [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	EC411	Industrial Management and Entrepreneurship	3	-	-	30	70	3.0	HS
2	EC412	Microwave Engineering	3	-	-	30	70	3.0	PC
3	EC413	Professional Elective-V	3	-	-	30	70	3.0	PE
4	EC414	Professional Elective-VI (MOOCs)	-	-	-	-	100	2.0	PE
5	EC415	Open Elective-III (MOOCs)	-	-	-	-	100	2.0	OE
6	EC416	5G Communications	3	-	-	30	70	3.0	PC
7	EC451	Skill Enhancement Course-5	-	1	2	30	70	2.0	SEC
8	EC452	Summer Internship-2	-	-	-	30	70	2.0	PR
9	EC453	Advanced Communication Lab	-	-	2	30	70	1.0	PC
10	EC454	Term Paper	-	-	2	30	70	1.0	PR
		TOTAL	**12**	**1**	**6**	240	760	**22**	TPW-19
		Honors/Minor course (Maximum Two courses can be registered)	**3**	**-**	**-**	**30**	**70**	**3**	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	Internship and Project	-	-	24	30	70	12.0	PR
		TOTAL	**0**	**0**	**24**	30	70	**12**	TPW-24

Professional Elective Courses

Code No.	Subject Name	Code No.	Subject Name
ECPE01	Information Theory & Coding	ECPE02	Data Communication and Networking
ECPE03	Optical Communication	ECPE04	Cellular & Mobile Communication
ECPE05	Embedded Systems	ECPE06	Digital System Design
ECPE07	Linear Control Systems	ECPE08	Artificial Neural Networks
ECPE09	Radar & Navigational Aids	ECPE10	Pattern Recognition
ECPE11	Electronic Measurements & Instrumentation	ECPE12	Wireless Sensor Networks
ECPE13	Computer System Architecture	ECPE14	Speech Processing

Skill Courses

Code No.	Subject Name	Code No.	Subject Name
ECSL1	Employability Skills-I	ECSL2	Employability Skills-II
ECSL3	Industry Standard Coding Practice-I	ECSL4	Industry Standard Coding Practice-II
ECSL5	Skill Orientation Course		

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 12 credits with minimum one subject from each pool.

3. Compulsory MOOC/NPTEL Courses for 06 credits (02 courses@ 3 credits each)

Pool 1

Code No.	Subject Name	Code No.	Subject Name
ECHR11	Advanced Embedded Systems	ECHR12	Advanced Digital Signal Processing
ECHR13	Digital Image & Video Processing	ECHR14	Wireless Broadband Communications

Pool 2

Code No.	Subject Name	Code No.	Subject Name
ECHR21	Non-Linear Optical Communication	ECHR22	Satellite Communication
ECHR23	Advanced VLSI	ECHR24	Internet of Things

Pool 3

Code No.	Subject Name	Code No.	Subject Name
ECHR31	Radar Engineering	ECHR32	Wireless Communications
ECHR33	Advanced Wireless Broadband Communications	ECHR34	Optical Networks

Pool 4

Code No.	Subject Name	Code No.	Subject Name
ECHR41	Multicarrier Communication Systems	ECHR42	Nano Electronics
ECHR43	RF and Mixed Signals Circuits	ECHR44	Microelectronic Devices, Technology and Circuits

Open Elective Courses (Offered by other Departments)

Code No.	Subject Name	Code No.	Subject Name
CBOE1	Operating Systems Concepts	CBOE2	Business Analytics
CDOE1	Python for Data Science	CDOE2	Data Science for Engineers
CEOE1	Fundamentals of Building Planning	CEOE2	Remote Sensing and Gis
CEOE3	Disaster Management	CHOE1	Sustainable Engineering
CHOE2	Biofuels	CMOE1	Fundamentals of Artificial Intelligence
CMOE2	Programming with C++	COOE1	Fundamentals of IoT
COOE2	IoT Architecture and Protocols	CSOE1	Programming with JAVA
CSOE2	Relational DataBase Management System	EEOE1	Renewable Energy Sources
EEOE2	Utilization of Electrical Energy	ITOE1	Data Structures and Algorithms
ITOE2	Web Technologies	MEOE1	Operations Research
MEOE2	Elements of Robotics		

General Minor Courses (Offered by other Department)

Note : 1. A student can opt any 4 subjects from each pool @ 3 credits per subject.

2. Compulsory MOOC/NPTEL Courses for 06 credits (02 courses@ 3 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	Thermodynamics and Reaction Engineering
CHMR5	Industrial Pollution Control Engineering	CHMR6	Principles of Safety Management

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		

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

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

Industry Track - Minor Courses

Note : 1. A student can opt any 4 subjects from each Track @ 3 credits per subject.
2. Compulsory MOOC/NPTEL Courses for 06 credits (02 courses@ 3 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	Mechanics of Robots	ARMR4	Industrial Automation
ARMR5	Computer Integrated Manufacturing	ARMR6	3D Printing

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

Code No.	Subject Name	Code No.	Subject Name
FSMR1	Client Side Scripting	FSMR2	React Js
FSMR3	C# (.Net Framework)	FSMR4	MEAN stack (MongoDB, Express JS, Angular JS, Node JS)
FSMR5	Web Application Development using Asp		

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

Minor in Quantum Technolgies (Offered by Computer Science & Business Systems)

Code No.	Subject Name	Code No.	Subject Name
QTMR1	Fundamentals of Quantum Computing	QTMR2	Foundations of Quantum Technologies
QTMR3	Basic Programming Lab	QTMR4	Basic Laboratory Course for Quantum Technologies
QTMR5	Introduction to Quantum Computation	QTMR6A	Introduction to Quantum Communication
QTMR6B	Engineering Foundation of Quantum Technologies	QTMR7	Introduction to Quantum Sensing
QTMR8	Introduction to Quantum Materials		

Department of ELECTRONICS & COMMUNICATION ENGINEERING

Open Electives (Offered to other Departments)

Code No.	Subject Name	Code No.	Subject Name
ECOE1	Applied Electronics	ECOE2	Microprocessors & Interfacing

General Minor Course (Offered to other Departments)

Code No.	Subject Name	Code No.	Subject Name
ECMR1	Electronics Devices & Circuits	ECMR2	Digital Logic Design
ECMR3	Network Analysis	ECMR4	Electronic Circuit Analysis
ECMR5	Signals and Systems	ECMR6	Microprocessors & Interfacing