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

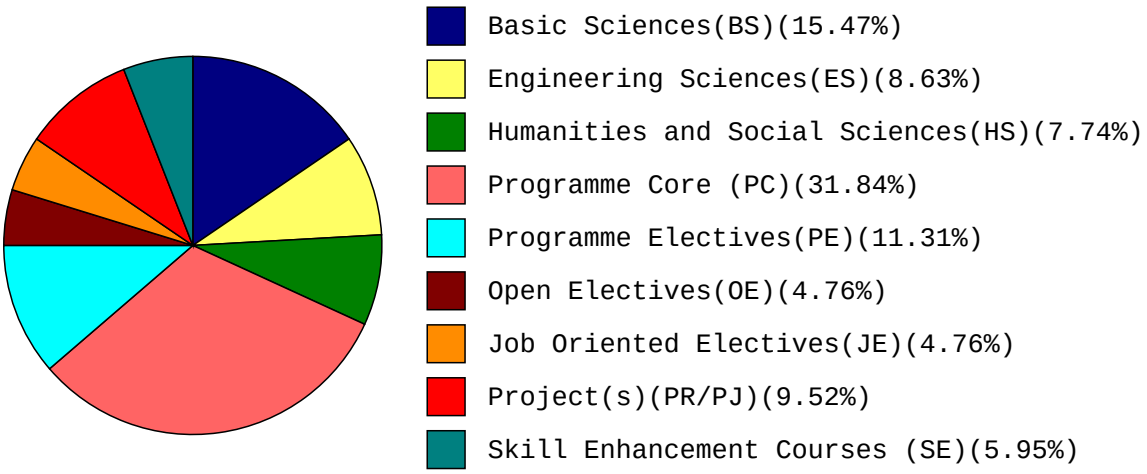
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (IoT)

B.TECH. COMPUTER SCIENCE & ENGINEERING (IoT)

(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)	16.25	29	26
Engineering Sciences (ES)	9.06	19	14.5
Humanities and / Social Sciences (HS)	8.13	16	13
Professional Core (PC)	33.44	65	53.5
Professional Elective(s) (PE)	11.88	19	19
Open Elective(s) (OE)	5	6	8
Job Oriented Elective(s) (JE)	0		0
Project(s) (PR/PJ)	10	28	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. COMPUTER SCIENCE & ENGINEERING (IoT)

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	CO/CD/CM/ CS/IT111	Linear Algebra, Calculus and Differential Equations	3	-	-	30	70	3.0	BS
2	CO/CD/CS/ IT112	Engineering Physics	3	-	-	30	70	3.0	BS
3	CO/CD/CM/ CS/IT113	Basic Electrical and Electronics Engineering	3	-	-	30	70	3.0	BS
4	CO/CD/CM/ CS/EC/IT114	Programming for Problem Solving	4	-	-	30	70	4.0	ES
5	CO151	Engineering Physics Lab	-	-	2	30	70	1.0	BS
6	CO152	Basic Electrical and Electronics Engineering Lab	-	-	2	30	70	1.0	ES
7	CO153	Programming for Problem Solving Lab	-	-	3	30	70	1.5	ES
8	CO/CD/CM/ CS/IT154	Engineering Graphics	1	-	2	30	70	2.0	ES
9	CO/CB/CM/ CD/CS/IT155	NSS / NCC / Community Service	-	-	1	30	70	0.5	BS
		TOTAL	**14**	**0**	**10**	270	630	**19**	TPW-24

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	CO/CD/CM/ CS/IT121	Integral Calculus and Transforms	3	-	-	30	70	3.0	BS
2	CO/CD/CS/ IT122	Engineering Chemistry	2	-	-	30	70	2.0	BS
3	CO/CD/CM/ CS/IT123	Communicative English	2	-	-	30	70	2.0	HS
4	CO/CD/CM/ CS/IT124	Digital Logic Design	3	-	-	30	70	3.0	ES
5	CO/CB/CM/ CS/IT125	Python Programming	2	-	-	30	70	2.0	ES
6	CO/CD/CS/ IT126	Data Structures	4	-	-	30	70	4.0	PC
7	CO161	Engineering Chemistry Lab	-	-	2	30	70	1.0	BS
8	CO162	Communicative English Lab	-	-	2	30	70	1.0	HS
9	CO163	Python Programming Lab	-	-	2	30	70	1.0	ES
10	CO164	Data Structures Lab	-	-	3	30	70	1.5	PC
11	CO/CB/CD/ CS/IT165	Health and Wellness, Yoga and Sports	-	-	1	30	70	0.5	BS
		TOTAL	**16**	**0**	**10**	330	770	**21**	TPW-26

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	CO/CD/CM/ CS/IT211	Probability, Statistics & Complex Analysis	3	-	-	30	70	3.0	BS
2	CO/CB/CD/ CM/CS/IT212	Universal Human Values-II Understanding Harmony	2	-	-	30	70	2.0	HS
3	CO/CD/CM/ CS/IT213	Discrete Mathematical Structures	3	-	-	30	70	3.0	BS
4	CO/CD/CM/ CS/IT214	Computer Organization	3	-	-	30	70	3.0	PC
5	CO/CB/CM/ CS/IT215	Design and Analysis of Algorithms	3	-	-	30	70	3.0	PC
6	CO/CB/CD/ CM/CS/IT216	Object Oriented Programming	3	-	-	30	70	3.0	PC
7	CO251	Skill Enhancement Course-1	-	-	4	30	70	2.0	SEC
8	CO252	Design and Analysis of Algorithms Lab	-	-	3	30	70	1.5	PC
9	CO253	Object Oriented Programming Lab	-	-	3	30	70	1.5	PC
10	MC1	Constitution of India	2	-	-	100	-	0.0	MC
		TOTAL	**19**	**0**	**10**	370	630	**22**	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	CO/CM/CS/ IT221	Computational Satistics	3	-	-	30	70	3.0	BS
2	CO222	Fundamentals of IoT	3	-	-	30	70	3.0	PC
3	CO/CB/CD/ CM/CS/IT223	Database Management System	3	-	-	30	70	3.0	PC
4	CO/CB/CD/ CM/CS/IT224	Operating System	3	-	-	30	70	3.0	PC
5	CO/CM225	Computer Networks	3	-	-	30	70	3.0	PC
6	CO261	Skill Enhancement Course-2	-	-	4	30	70	2.0	SEC
7	CO/CB/CD/ CM/CS/IT262	Design Thinking and Innovation	1	-	2	30	70	2.0	HS
8	CO263	Fundamentals of IoT Lab	-	-	3	30	70	1.5	PC
9	CO264	Database Management System Lab	-	-	3	30	70	1.5	PC
10	MC2	Environmental Science	2	-	-	100	-	0.0	MC
		TOTAL	**18**	**0**	**12**	370	630	**22**	TPW-30
Internship 2 weeks (Mandatory) during summer vacation (to be evaluated during next semester)									
Minor course (Maximum Two courses can be registered)			**3**	**-**	**-**	**30**	**70**	**3**	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	CO/CM311	Theory of Computation	2	-	-	30	70	2.0	HS
2	CO/CM312	Software Engineering	3	-	-	30	70	3.0	PC
3	CO313	Professional Elective-I	3	-	-	30	70	3.0	PE
4	CO314	Professional Elective-II	3	-	-	30	70	3.0	PE
5	CO315	Open Elective-I	3	-	-	30	70	3.0	OE
6	CO316	Artificial Intelligence	3	-	-	30	70	3.0	PC
7	CO351	Skill Enhancement Course-3	-	1	2	30	70	2.0	SEC
8	CO352	Summer Internship-1	-	-	2	30	70	1.0	PR
9	CO353	Professional Elective-I Lab	-	-	2	30	70	1.0	PE
10	CO354	Artificial Intelligence Lab	-	-	2	30	70	1.0	PC
11	MC3	Technical Paper Writing and IPR	-	-	2	100	-	0.0	MC
		TOTAL	**17**	**1**	**10**	400	700	**22**	TPW-28
Minor course (Maximum Two courses can be registered)			**3**	**-**	**-**	**30**	**70**	**3**	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	CO321	Data Analysis	2	-	-	30	70	2.0	PC
2	CO322	IoT Architecture and Protocols	3	-	-	30	70	3.0	PC
3	CO323	Machine Learning	3	-	-	30	70	3.0	PC
4	CO324	Professional Elective-III	3	-	-	30	70	3.0	PE
5	CO325	Professional Elective-IV	3	-	-	30	70	3.0	PE
6	CO326	Open Elective-II	3	-	-	30	70	3.0	OE
7	CO361	Skill Enhancement Course-4	-	1	2	30	70	2.0	SEC
8	CO362	Tinkering Lab	-	-	2	30	70	1.0	HS
9	CO363	IoT Architecture and Protocol Lab	-	-	2	30	70	1.0	PC
10	CO364	Machine Learning Lab	-	-	2	30	70	1.0	PC
		TOTAL	**17**	**1**	**8**	300	700	**22**	TPW-26
Internship 4 weeks (Mandatory) during summer vacation (to be evaluated during next semester)									
Minor course (Maximum Two courses can be registered)			**3**	**-**	**-**	**30**	**70**	**3**	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	CO411	Humanities Elective	3	-	-	30	70	3.0	HS
2	CO/CM412	Natural Language Processing	3	-	-	30	70	3.0	PC
3	CO413	Professional Elective-V	3	-	-	30	70	3.0	PE
4	CO414	Professional Elective-VI (MOOCs)	-	-	-	-	100	2.0	PE
5	CO415	Open Elective-III (MOOCs)	-	-	-	-	100	2.0	OE
6	CO451	Skill Enhancement Course-5	-	1	2	30	70	2.0	SEC
7	CO452	Summer Internship-2	-	-	-	30	70	2.0	PR
8	CO453	Natural Language Processing Lab	-	-	2	30	70	1.0	PC
9	CO454	Professional Elective-V Lab	-	-	2	30	70	1.0	PE
10	CO455	Term Paper	-	-	2	30	70	1.0	PR
		TOTAL	**9**	**1**	**8**	240	760	**20**	TPW-18
Minor course (Maximum Two courses can be registered)			**3**	**-**	**-**	**30**	**70**	**3**	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	CO461	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
COPE01	Advanced Java Programming	COPE02	Web Technologies
COPE03	Mobile Application Development	COPE04	Compiler Design
COPE05	Microcontroller	COPE06	Sensors and Actuator Devices
COPE07	Embedded Systems and Its Applications	COPE08	Energy Management for IoT Devices
COPE09	Wireless Sensor Networks	COPE10	Data Communications and Networking for IoT
COPE11	Software Defined Networks	COPE12	Fundamentals of Fog and Edge Computing
COPE13	Cryptography and Network Security	COPE14	Cyber Security
COPE15	IoT Security	COPE16	Privacy and Security in IoT
COPE17	Big Data Analytics	COPE18	Data Science in IoT
COPE19	Artificial Neural Networks	COPE20	Cloud Computing
COPE21	Cloud Based IoT	COPE22	Blockchain Technology

Skill Courses

Code No.	Subject Name	Code No.	Subject Name
COSL1	Employability Skills-I	COSL2	Employability Skills-II
COSL3	Industry Standard Coding Practice-I	COSL5	Skill Orientation Course
COSL4	Industry Standard Coding Practice-II		

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

Open Elective Courses (Offered by other Departments)

Code No.	Subject Name	Code No.	Subject Name
CEOE1	Fundamentals of Building Planning	CEOE2	Remote Sensing and Gis
CEOE3	Disaster Management	CHOE1	Sustainable Engineering
CHOE2	Biofuels	ECOE1	Applied Electronics
ECOE2	Microprocessors & Interfacing	EEOE1	Renewable Energy Sources
EEOE2	Utilization of Electrical Energy	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 Electronics & Communication Engineering

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

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		

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 COMPUTER SCIENCE & ENGINEERING (IoT)

Open Electives (Offered to other Departments)

Code No.	Subject Name	Code No.	Subject Name
COOE1	Fundamentals of IoT	COOE2	IoT Architecture and Protocols

General Minor Course (Offered to other Departments)

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