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

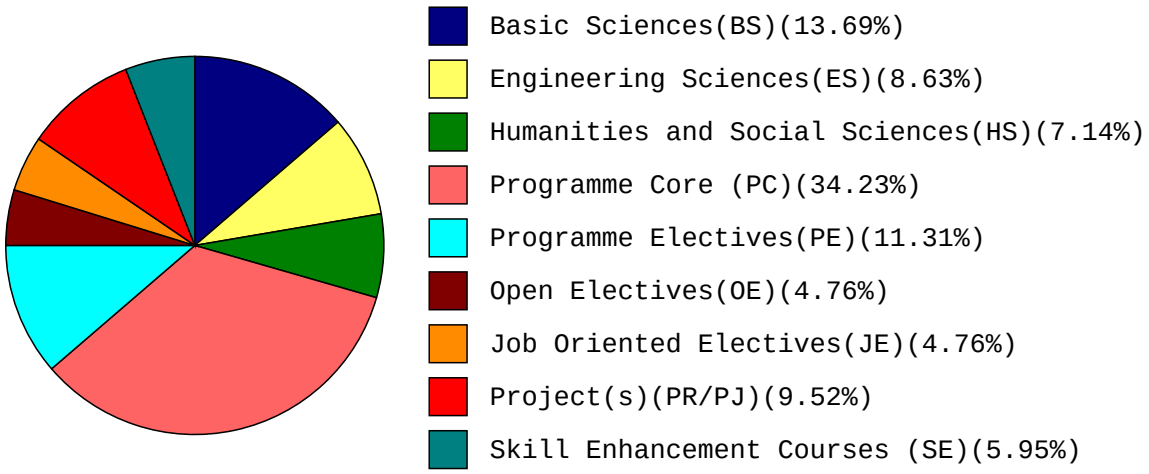
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (AI & ML)

B.TECH. COMPUTER SCIENCE & ENGINEERING (AI & ML)

(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)	14.37	25	23
Engineering Sciences (ES)	9.06	18	14.5
Humanities and / Social Sciences (HS)	7.5	16	12
Professional Core (PC)	35.94	70	57.5
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	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. COMPUTER SCIENCE & ENGINEERING (AI & ML)

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	CM/CD/CO/ CS/IT111	Linear Algebra, Calculus and Differential Equations	3	-	-	30	70	3.0	BS
2	CM/EC/EE112	Chemistry for Engineers	3	-	-	30	70	3.0	BS
3	CM/CD/CO/ CS/IT113	Basic Electrical and Electronics Engineering	3	-	-	30	70	3.0	ES
4	CM/CD/CO/ CS/EC/IT114	Programming for Problem Solving	4	-	-	30	70	4.0	ES
5	CM151	Chemistry Lab	-	-	2	30	70	1.0	BS
6	CM152	Basic Electrical and Electronics Engineering Lab	-	-	2	30	70	1.0	ES
7	CM153	Programming for Problem Solving Lab	-	-	3	30	70	1.5	ES
8	CM154	Engineering Graphics	1	-	2	30	70	2.0	ES
9	CM/CB/CO/ CD/CS/IT155	Health and Wellness, Yoga and Sports	-	-	1	30	70	0.5	HS
		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	CM/CD/CO/ CS/IT121	Integral Calculus and Transforms	3	-	-	30	70	3.0	BS
2	CM122	Applied Physics	3	-	-	30	70	3.0	BS
3	CM/CD/CO/ CS/IT123	Communicative English	2	-	-	30	70	2.0	HS
4	CM/CD/CO/ CS/IT124	Digital Logic Design	3	-	-	30	70	3.0	ES
5	CM/CB/CO/ CS/IT125	Python Programming	2	-	-	30	70	2.0	PC
6	CM/CB126	Data Structures and Algorithms	3	-	-	30	70	3.0	PC
7	CM161	Applied Physics Lab	-	-	2	30	70	1.0	BS
8	CM162	Communicative English Lab	-	-	2	30	70	1.0	HS
9	CM163	Python Programming Lab	-	-	2	30	70	1.0	PC
10	CM164	Data Structures and Algorithms Lab	-	-	3	30	70	1.5	PC
11	CM165	NSS / NCC / Community Service	-	-	1	30	70	0.5	HS
		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	CM/CD/CO/ CS/IT211	Probability, Statistics & Complex Analysis	3	-	-	30	70	3.0	BS
2	CM/CB/CD/ CO/CS/IT212	Universal Human Values-Iii Understanding Harmony	2	-	-	30	70	2.0	HS
3	CM/CD/CO/ CS/IT213	Discrete Mathematical Structures	3	-	-	30	70	3.0	BS
4	CM/CD/CO/ CS/IT214	Computer Organization	3	-	-	30	70	3.0	PC
5	CM/CB/CO/ CS/IT215	Design and Analysis of Algorithms	3	-	-	30	70	3.0	PC
6	CM/CB/CD/ CO/CS/IT216	Object Oriented Programming	3	-	-	30	70	3.0	PC
7	CM251	Skill Enhancement Course-1	-	-	4	30	70	2.0	SEC
8	CM252	Design and Analysis of Algorithms Lab	-	-	3	30	70	1.5	PC
9	CM253	Object Oriented Programming Lab	-	-	3	30	70	1.5	PC
10	MC2	Environmental Science	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	CM/CO/CS/ IT221	Computational Statistics	3	-	-	30	70	3.0	BS
2	CM/CB/CD/ CS/IT222	Artificial Intelligence	3	-	-	30	70	3.0	PC
3	CM/CB/CD/ CO/CS/IT223	Database Management System	3	-	-	30	70	3.0	PC
4	CM/CB/CD/ CO/CS/IT224	Operating System	3	-	-	30	70	3.0	PC
5	CM/CO225	Computer Networks	3	-	-	30	70	3.0	PC
6	CM261	Skill Enhancement Course-2	-	-	4	30	70	2.0	SEC
7	CM/CB/CD/ CO/CS/IT262	Design Thinking and Innovation	1	-	2	30	70	2.0	HS
8	CM263	Artificial Intelligence Lab	-	-	3	30	70	1.5	PC
9	CM264	Database Management System Lab	-	-	3	30	70	1.5	PC
10	MC1	Constitution of India	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
	Code No.	Subject Name	Periods per week			Maximum Marks		Credits	
			L	T	P	SES	EXT		
1	CM/CO311	Theory of Computation	2	-	-	30	70	2.0	PC
2	CM/CO312	Software Engineering	3	-	-	30	70	3.0	PC
3	CM313	Professional Elective-I	3	-	-	30	70	3.0	PE
4	CM314	Professional Elective-II	3	-	-	30	70	3.0	PE
5	CM315	Open Elective-I	3	-	-	30	70	3.0	OE
6	CM316	Machine Learning	3	-	-	30	70	3.0	PC
7	CM351	Skill Enhancement Course-3	-	1	2	30	70	2.0	SEC
8	CM352	Summer Internship-1	-	-	-	30	70	1.0	PR
9	CM353	Professional Elective-I Lab	-	-	2	30	70	1.0	PE
10	CM354	Machine Learning Lab	-	-	2	30	70	1.0	PC
11	MC3	Technical Paper Writing and IPR	-	-	2	100	-	0.0	MC
		TOTAL	**17**	**1**	**8**	400	700	**22**	TPW-26
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
	Code No.	Subject Name	Periods per week			Maximum Marks		Credits	
			L	T	P	SES	EXT		
1	CM/CB/CS/ IT321	Cryptography and Network Security	3	-	-	30	70	3.0	PC
2	CM/CB/CD322	Deep Learning	3	-	-	30	70	3.0	PC
3	CM323	Cloud Computing Fundamentals	2	-	-	30	70	2.0	PC
4	CM324	Professional Elective-III	3	-	-	30	70	3.0	PE
5	CM325	Professional Elective-IV	3	-	-	30	70	3.0	PE
6	CM326	Open Elective-II	3	-	-	30	70	3.0	OE
7	CM361	Skill Enhancement Course-4	-	1	2	30	70	2.0	SEC
8	CM362	Tinkering Lab	-	-	2	30	70	1.0	HS
9	CM363	Deep Learning Lab	-	-	2	30	70	1.0	PC
10	CM364	Cryptography and Network Security 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	CM411	Humanities Elective	3	-	-	30	70	3.0	HS
2	CM/CO412	Natural Language Processing	3	-	-	30	70	3.0	PC
3	CM413	Professional Elective-V	3	-	-	30	70	3.0	PE
4	CM414	Professional Elective-VI (MOOCs)	-	-	-	-	100	2.0	PE
5	CM415	Open Elective-III (MOOCs)	-	-	-	-	100	2.0	OE
6	CM451	Skill Enhancement Course-5	-	1	2	30	70	2.0	SEC
7	CM452	Summer Internship-2	-	-	-	30	70	2.0	PR
8	CM453	Natural Language Processing Lab	-	-	2	30	70	1.0	PC
9	CM454	Professional Elective-V Lab	-	-	2	30	70	1.0	PE
10	CM455	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	CM461	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
CMPE11	Data and Visual Analytics	CMPE12	Client & Server Side Scripting
CMPE13	Interactive Computer Graphics	CMPE14	Object Oriented Analysis and Design
CMPE15	Nosql Databases	CMPE21	Big Data Analytics
CMPE22	Drone Technologies	CMPE23	Augmented and Virtual Reality
CMPE24	Software Testing & Quality Assurance	CMPE25	Cyber Security and Forensics
CMPE31	Business Intelligence & Analytics	CMPE32	Stack Development Frame Works
CMPE33	Digital Image Processing	CMPE34	Continuous Delivery and Devops
CMPE35	Internet of Things (Iot)	CMPE41	GENAI and Agentic AI
CMPE42	Soft Computing	CMPE43	Computer Vision
CMPE44	Introduction to Quantum Computing	CMPE45	Ethical Hacking
CMPE51	Reinforcement Learning	CMPE52	UI and Ux Design
CMPE53	Autonomous Navigation	CMPE54	Applied AI & Ml
CMPE55	Federated Learning		

Skill Courses

Code No.	Subject Name	Code No.	Subject Name
CMSL1	Employability Skills-I	CMSL2	Employability Skills-II
CMSL3	Industry Standard Coding Practice-I	CMSL4	Industry Standard Coding Practice-II
CMSL5	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

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	Energy 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	ARMR7	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 (AI & ML)

Open Electives (Offered to other Departments)

Code No.	Subject Name	Code No.	Subject Name
CMOE1	Fundamentals of Artificial Intelligence	CMOE2	Programming with C++

General Minor Course (Offered to other Departments)

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