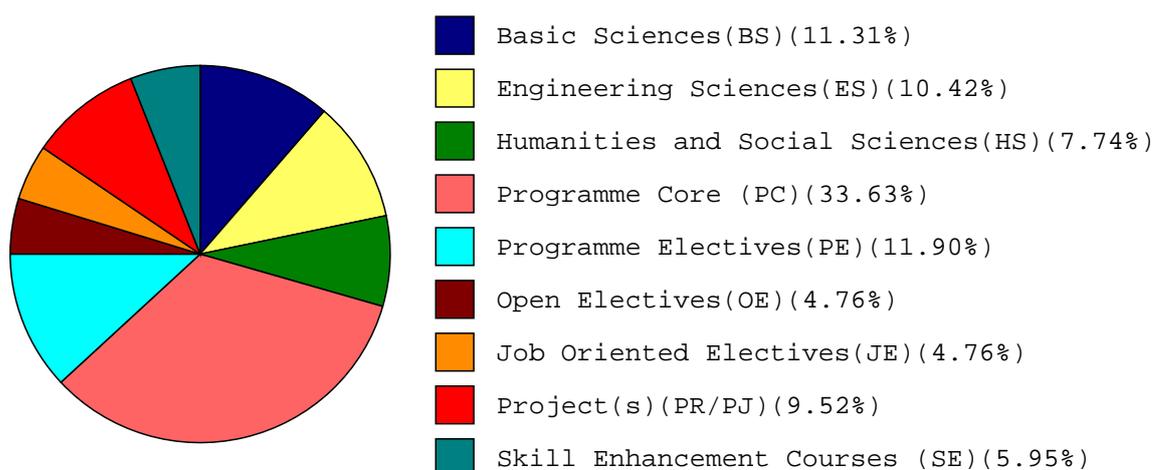


**R.V.R & J.C.COLLEGE OF ENGINEERING (Autonomous)**  
**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (DS)**

**B.TECH. COMPUTER SCIENCE & ENGINEERING (DS)**  
(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)	11.88	21	19
Engineering Sciences (ES)	10.94	22	17.5
Humanities and / Social Sciences (HS)	8.13	18	13
Professional Core (PC)	35.31	66	56.5
Professional Elective(s) (PE)	12.5	21	20
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	--
<b>Total number of Credits</b>			<b>160</b>



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

## B.TECH. COMPUTER SCIENCE & ENGINEERING (DS)

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	CD/CM/CO/ CS/IT111	Linear Algebra, Calculus and Differential Equations	3	-	-	30	70	3.0	BS
2	CD/CO/CS/ IT112	Engineering Physics	3	-	-	30	70	3.0	BS
3	CD/CM/CO/ CS/IT113	Basic Electrical and Electronics Engineering	3	-	-	30	70	3.0	ES
4	CD/CM/CO/ CS/EC/IT114	Programming for Problem Solving	4	-	-	30	70	4.0	ES
5	CD151	Engineering Physics Lab	-	-	2	30	70	1.0	BS
6	CD152	Basic Electrical and Electronics Engineering Lab	-	-	2	30	70	1.0	ES
7	CD153	Programming for Problem Solving Lab	-	-	3	30	70	1.5	ES
8	CD/CM/CO/ CS/IT154	Engineering Graphics	1	-	2	30	70	2.0	ES
9	CD/CB/CO/ CM/CS/IT155	NSS / NCC / Community Service	-	-	1	30	70	0.5	HS
<b>TOTAL</b>			<b>14</b>	<b>0</b>	<b>10</b>	270	630	<b>19</b>	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	CD/CM/CO/ CS/IT121	Integral Calculus and Transforms	3	-	-	30	70	3.0	BS
2	CD/CO/CS/ IT122	Engineering Chemistry	2	-	-	30	70	2.0	BS
3	CD/CM/CO/ CS/IT123	Communicative English	2	-	-	30	70	2.0	HS
4	CD/CO/CM/ CS/IT124	Digital Logic Design	3	-	-	30	70	3.0	ES
5	CD125	Python for Data Science	2	-	-	30	70	2.0	ES
6	CD/CO/CS/ IT126	Data Structures	4	-	-	30	70	4.0	PC
7	CD161	Engineering Chemistry Lab	-	-	2	30	70	1.0	BS
8	CD162	Communicative English Lab	-	-	2	30	70	1.0	HS
9	CD163	Python for Data Science Lab	-	-	2	30	70	1.0	ES
10	CD164	Data Structures Lab	-	-	3	30	70	1.5	PC
11	CD/CB/CO/ CS/IT165	Health and wellness, Yoga and Sports	-	-	1	30	70	0.5	HS
<b>TOTAL</b>			<b>16</b>	<b>0</b>	<b>10</b>	330	770	<b>21</b>	TPW-26

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

SNo.	Course Details		Scheme of Instruction			Scheme of Examination		Credits	Category Code
	Code No.	Subject Name	Periods per week			Maximum Marks			
			L	T	P	SES	EXT		
1	CD/CM/CO/CS/IT211	Probability, Statistics & Complex Analysis	3	-	-	30	70	3.0	BS
2	CD/CB/CM/CO/CS/IT212	Universal Human Values-II Understanding Harmony	2	-	-	30	70	2.0	HS
3	CD/CM/CO/CS/IT213	Discrete Mathematical Structures	3	-	-	30	70	3.0	BS
4	CD/CM/CO/CS/IT214	Computer Organization	3	-	-	30	70	3.0	PC
5	CD215	Data Visualization	3	-	-	30	70	3.0	PC
6	CD/CB/CM/CO/CS/IT216	Object Oriented Programming	3	-	-	30	70	3.0	PC
7	CD251	Skill Enhancement Course-1	-	-	4	30	70	2.0	SEC
8	CD252	Business Communication and Value Science Lab	-	-	2	30	70	1.0	HS
9	CD253	Object Oriented Programming Lab	-	-	2	30	70	1.0	PC
10	CD254	Data Visualization Lab	-	-	2	30	70	1.0	PC
11	MC1	Constitution of India	2	-	-	100	-	0.0	MC
<b>TOTAL</b>			<b>19</b>	<b>0</b>	<b>10</b>	400	700	<b>22</b>	TPW-29

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

SNo.	Course Details		Scheme of Instruction			Scheme of Examination		Credits	Category Code
	Code No.	Subject Name	Periods per week			Maximum Marks			
			L	T	P	SES	EXT		
1	CD221	Design and Analysis of Algorithms	3	-	-	30	70	3.0	PC
2	CD/CB/CM/CS/IT222	Artificial Intelligence	3	-	-	30	70	3.0	PC
3	CD/CB/CM/CO/CS/IT223	Database Management System	3	-	-	30	70	3.0	PC
4	CD/CB/CM/CO/CS/IT224	Operating System	3	-	-	30	70	3.0	PC
5	CD/CB/CS/IT225	Software Engineering	3	-	-	30	70	3.0	PC
6	CD261	Skill Enhancement Course-2	-	-	4	30	70	2.0	SEC
7	CD/CB/CM/CO/CS/IT262	Design Thinking and Innovation	1	-	2	30	70	2.0	HS
8	CD263	Design and Analysis of Algorithms Lab	-	-	2	30	70	1.0	PC
9	CD264	Database Management System Lab	-	-	2	30	70	1.0	PC
10	CD265	Operating System & Software Engineering Lab	-	-	2	30	70	1.0	PC
11	MC2	Environmental Science	2	-	-	100	-	0.0	MC
<b>TOTAL</b>			<b>18</b>	<b>0</b>	<b>12</b>	400	700	<b>22</b>	TPW-30
<b>Internship 2 weeks (Mandatory) during summer vacation (to be evaluated during next semester)</b>									
<b>Minor course (Maximum Two courses can be registered)</b>			<b>3</b>	<b>-</b>	<b>-</b>	<b>30</b>	<b>70</b>	<b>3</b>	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	CD311	Business Intelligence Tools	2	1	-	30	70	3.0	PC
2	CD/CB/CS/ IT312	Computer Networks	3	-	-	30	70	3.0	PC
3	CD313	Professional Elective-I	3	-	-	30	70	3.0	PE
4	CD314	Professional Elective-II	3	-	-	30	70	3.0	PE
5	CD315	Open Elective-I	3	-	-	30	70	3.0	OE
6	CD316	Web Development	2	-	-	30	70	2.0	PC
7	CD351	Skill Enhancement Course-3	-	1	2	30	70	2.0	SEC
8	CD352	Summer Internship-1	-	-	-	30	70	1.0	PR
9	CD353	Professional Elective-I Lab	-	-	2	30	70	1.0	PE
10	CD354	Web Development Lab	-	-	2	30	70	1.0	PC
11	MC3	Technical Paper Writing and IPR	-	-	2	100	-	0.0	MC
<b>TOTAL</b>			<b>16</b>	<b>2</b>	<b>8</b>	400	700	<b>22</b>	TPW-26
<b>Minor course (Maximum Two courses can be registered)</b>			<b>3</b>	<b>-</b>	<b>-</b>	<b>30</b>	<b>70</b>	<b>3</b>	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	CD321	Big Data Processing	2	-	-	30	70	2.0	PC
2	CD/CB/CM322	Deep Learning	3	-	-	30	70	3.0	PC
3	CD323	Cloud Computing	3	-	-	30	70	3.0	PC
4	CD324	Professional Elective-III	3	-	-	30	70	3.0	PE
5	CD325	Professional Elective-IV	3	-	-	30	70	3.0	PE
6	CD326	Open Elective-II	3	-	-	30	70	3.0	OE
7	CD361	Skill Enhancement Course-4	-	1	2	30	70	2.0	SEC
8	CD362	Tinkering Lab	-	-	2	30	70	1.0	HS
9	CD363	Big Data Processing Lab	-	-	2	30	70	1.0	PC
10	CD364	Deep Learning Lab	-	-	2	30	70	1.0	PE
<b>TOTAL</b>			<b>17</b>	<b>1</b>	<b>8</b>	300	700	<b>22</b>	TPW-26
<b>Internship 4 weeks (Mandatory) during summer vacation (to be evaluated during next semester)</b>									
<b>Minor course (Maximum Two courses can be registered)</b>			<b>3</b>	<b>-</b>	<b>-</b>	<b>30</b>	<b>70</b>	<b>3</b>	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
1	CD411	Humanities Elective	3	-	-	30	70	3.0	HS
2	CD412	Natural Language Processing	3	-	-	30	70	3.0	PC
3	CD413	Professional Elective-V	3	-	-	30	70	3.0	PE
4	CD414	Professional Elective-VI (MOOCs)	-	-	-	-	100	2.0	PE
5	CD415	Open Elective-III (MOOCs)	-	-	-	-	100	2.0	OE
6	CD451	Skill Enhancement Course-5	-	1	2	30	70	2.0	SEC
7	CD452	Summer Internship-2	-	-	-	30	70	2.0	PR
8	CD453	Natural Language Processing Lab	-	-	2	30	70	1.0	PC
9	CD454	Industry Oriented Lab	-	-	2	30	70	1.0	PE
10	CD455	Term Paper	-	-	2	30	70	1.0	PR
<b>TOTAL</b>			<b>9</b>	<b>1</b>	<b>8</b>	240	760	<b>20</b>	TPW-18
<b>Minor course (Maximum Two courses can be registered)</b>			<b>3</b>	<b>-</b>	<b>-</b>	<b>30</b>	<b>70</b>	<b>3</b>	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
1	CD461	Internship and Project	-	-	24	30	70	12.0	PR
<b>TOTAL</b>			<b>0</b>	<b>0</b>	<b>24</b>	30	70	<b>12</b>	TPW-24

**Professional Elective Courses**

Code No.	Subject Name	Code No.	Subject Name
CDPE01	Introduction to Machine Learning	CDPE02	Data Engineering
CDPE03	Soft Computing	CDPE04	Digital Image Processing
CDPE05	Software Testing Methodologies	CDPE06	Automata and Compiler Design
CDPE07	Data Science for Engineers	CDPE08	Modern Application Development
CDPE09	Foundations of Cryptography	CDPE10	Hardware Security
CDPE11	Web and Social Media Analytics	CDPE12	Object Oriented System Development using Uml, Java and Patterns
CDPE13	Fundamentals of Object Oriented Programming	CDPE14	Cryptography and Network Security
CDPE15	Network Security	CDPE16	Predictive Analytics
CDPE17	Programming in Modern C++	CDPE18	An Introduction to Programming Through C++
CDPE19	Privacy and Security in Social Media	CDPE20	Ethical Hacking
CDPE21	Time Series Analysis and Forecasting	CDPE22	Introduction to Internet of Things
CDPE23	Programming with Generative AI	CDPE24	Informationsecurity-5-Secure Systems Engineering
CDPE25	Cyber Security and Privacy	CDPE26	Programming, Data Structures and Algorithms using Python
CDPE27	Data Structure and Algorithms using Java and Patterns	CDPE28	Quantum Algorithms and Cryptography
CDPE29	Online Privacy	CDPE30	Practical Cyber Security for Cyber Security Practitioners
CDPE31	Block Chain and Its Applications	CDPE32	Software Testing
CDPE33	Social Networks	CDPE34	Introduction to Algorithms and Analysis
CDPE35	Deep Learning for Computer Vision	CDPE36	Advanced Computer Architecture

CDPE37	Real-Time Systems	CDPE38	Algorithms for Competitive Programming
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### Skill Courses

Code No.	Subject Name	Code No.	Subject Name
CDSL1	Employability Skills-I	CDSL2	Employability Skills-II
CDSL3	Industry Standard Coding Practice-I	CDSL4	Industry Standard Coding Practice-II
CDSL5	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 Technologies** (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 (DS)

### Open Electives (Offered to other Departments)

Code No.	Subject Name	Code No.	Subject Name
CDOE1	Python for Data Science	CDOE2	Data Science for Engineers

### General Minor Course (Offered to other Departments)

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