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

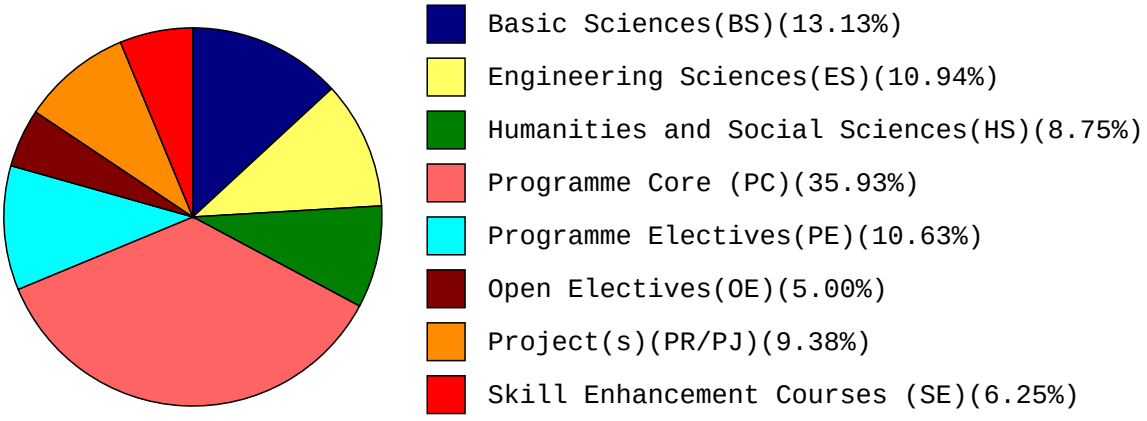
DEPARTMENT OF CHEMICAL ENGINEERING

B.TECH. CHEMICAL 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)	13.13	24	21
Engineering Sciences (ES)	10.94	24	17.5
Humanities and / Social Sciences (HS)	8.75	18	14
Professional Core (PC)	35.94	69	57.5
Professional Elective(s) (PE)	10.63	15	17
Open Elective(s) (OE)	5	6	8
Project(s) (PR/PJ)	9.38	24	15
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. CHEMICAL 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	CH/CE/ME111	Matrices and Calculus	2	1	-	30	70	3.0	BS
2	CH112	Physical Chemistry	3	-	-	30	70	3.0	BS
3	CH/CE/EC/ EE/ME113	Basic Civil and Mechanical Engineering	3	-	-	30	70	3.0	ES
4	CH/CE/EE/ ME114	Programming with C	4	-	-	30	70	4.0	ES
5	CH/CE/EC/ EE/ME115	Communicative English	2	-	-	30	70	2.0	HS
6	CH151	Engineering Chemistry Lab	-	-	2	30	70	1.0	BS
7	CH152	Communicative English Lab	-	-	2	30	70	1.0	HS
8	CH153	Programming with C Lab	-	-	3	30	70	1.5	ES
9	CH/CE/CM/ EC/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	CH/CE/ME121	Differential Equations and Vector Calculus	2	1	-	30	70	3.0	BS
2	CH122	Physics of Engineering Materials	3	-	-	30	70	3.0	BS
3	CH/CE/ME123	Basic Electrical and Electronics Engineering	3	-	-	30	70	3.0	ES
4	CH124	Fluid and Particle Mechanics	3	-	-	30	70	3.0	PC
5	CH161	Engineering Physics Lab	-	-	2	30	70	1.0	BS
6	CH162	Basic Electrical and Electronics Engineering Lab	-	-	3	30	70	1.5	ES
7	CH163	Fluid and Particle Mechanics Lab	-	-	3	30	70	1.5	PC
8	CH/CE/EC/ EE/ME164	Engineering Workshop	-	-	3	30	70	1.5	ES
9	CH/EC/EE165	Engineering Graphics	1	-	4	30	70	3.0	ES
10	CH/CE/CM/ EC/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	CH211	Transforms, Probability and Statistics	2	1	-	30	70	3.0	BS
2	CH212	Organic Chemistry	3	-	-	30	70	3.0	BS
3	CH213	Chemical Engineering Thermodynamics-I	2	1	-	30	70	3.0	PC
4	CH214	Chemical Process Calculations	2	1	-	30	70	3.0	PC
5	CH215	Mechanical Operations	3	-	-	30	70	3.0	PC
6	CH251	Skill Enhancement Course-1	-	-	4	30	70	2.0	SEC
7	CH/CE/EC/ EE/ME252	Design Thinking and Innovation	1	-	2	30	70	2.0	HS
8	CH253	Organic Chemistry Lab	-	-	2	30	70	1.0	BS
9	CH254	Mechanical Operations Lab	-	-	2	30	70	1.0	PC
10	MC2	Environmental Science	2	-	-	100	-	0.0	MC
		TOTAL	**15**	**3**	**10**	370	630	**21**	TPW-28

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	CH221	Process Economics and Industrial Management	2	-	-	30	70	2.0	HS
2	CH/CE/EC/ EE/ME222	Universal Human Values-II Understanding Harmony	2	-	-	30	70	2.0	HS
3	CH223	Chemical Engineering Thermodynamics-II	2	1	-	30	70	3.0	PC
4	CH224	Process Heat Transfer	2	1	-	30	70	3.0	PC
5	CH225	Chemical Technology	3	-	-	30	70	3.0	PC
6	CH226	Chemical Reaction Engineering-I	2	1	-	30	70	3.0	PC
7	CH261	Skill Enhancement Course-2	-	-	4	30	70	2.0	SEC
8	CH262	Process Heat Transfer Lab	-	-	2	30	70	1.0	PC
9	CH263	Computational Programming Lab	1	-	2	30	70	2.0	PC
10	CH264	Chemical Technology Lab	-	-	2	30	70	1.0	PC
11	MC1	Constitution of India	2	-	-	100	-	0.0	MC
		TOTAL	**16**	**3**	**10**	400	700	**22**	TPW-29
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	CH311	Mass Transfer Operations-I	2	1	-	30	70	3.0	PC
2	CH312	Chemical Reaction Engineering-II	2	1	-	30	70	3.0	PC
3	CH313	Professional Elective-I	3	-	-	30	70	3.0	PE
4	CH314	Professional Elective-II	3	-	-	30	70	3.0	PE
5	CH315	Open Elective-I	3	-	-	30	70	3.0	OE
6	CH351	Skill Enhancement Course-3	-	1	2	30	70	2.0	SEC
7	CH352	Summer Internship-1	-	-	-	30	70	1.0	PR
8	CH353	Tinkering Lab	-	-	2	30	70	1.0	HS
9	CH354	Mass Transfer Operations-I Lab	-	-	2	30	70	1.0	PC
10	CH355	Chemical Reaction Engineering Lab	-	-	2	30	70	1.0	PC
		TOTAL	**13**	**3**	**8**	300	700	**21**	TPW-24
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	CH321	Mass Transfer Operations-II	2	1	-	30	70	3.0	PC
2	CH322	Instrumentation and Process Control	2	1	-	30	70	3.0	PC
3	CH323	Industrial Pollution Control	3	-	-	30	70	3.0	PC
4	CH324	Professional Elective-III	3	-	-	30	70	3.0	PE
5	CH325	Professional Elective-IV	3	-	-	30	70	3.0	PE
6	CH326	Open Elective-II	3	-	-	30	70	3.0	OE
7	CH361	Skill Enhancement Course-4	-	1	2	30	70	2.0	SEC
8	CH362	Mass Transfer Operations-II Lab	-	-	2	30	70	1.0	PC
9	CH363	Instrumentation and Process Control Lab	-	-	2	30	70	1.0	PC
10	CH364	Industrial Pollution Control Lab	-	-	2	30	70	1.0	PC
11	MC3	Technical Paper Writing and IPR	-	-	2	100	-	0.0	MC
		TOTAL	**16**	**3**	**10**	400	700	**23**	TPW-29
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	CH411	Hs Elective	3	-	-	30	70	3.0	HS
2	CH412	Transport Phenomena	2	1	-	30	70	3.0	PC
3	CH413	Professional Elective-V	3	-	-	30	70	3.0	PE
4	CH414	Professional Elective-VI (MOOCs)	-	-	-	-	100	2.0	PE
5	CH415	Open Elective-III (MOOCs)	-	-	-	-	100	2.0	OE
6	CH416	Chemical Process and Equipment Design	2	1	-	30	70	3.0	PC
7	CH451	Skill Enhancement Course-5	-	1	2	30	70	2.0	SEC
8	CH452	Summer Internship-2	-	-	-	30	70	2.0	PR
9	CH453	Computer Aided Process Equipment Design Lab	-	-	2	30	70	1.0	PC
		TOTAL	**10**	**3**	**4**	210	690	**21**	TPW-17
		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	CH461	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
CHPE01	Petroleum Exploration and Well Logging	CHPE02	Petroleum Refinery Engineering
CHPE03	Petrochemical Technology	CHPE04	Natural Gas Production and Its Applications
CHPE05	General Pharmacy	CHPE06	Pre-Formulation Studies Including Stability Studies
CHPE07	Industrial Pharmacy	CHPE08	Quality Control of Pharmaceutical Dosage Forms
CHPE09	Computer Simulators	CHPE10	Computer Aided Process Engineering
CHPE11	Computer Aided Design	CHPE12	Computational Fluid Dynamics
CHPE13	Electrochemical Engineering	CHPE14	Industrial Hazards and Safety Analysis
CHPE15	Nanotechnology	CHPE16	Bio-Chemical Engineering
CHPE17	Fluidization Engineering	CHPE18	Polymer Science and Engineering
CHPE19	Solid Waste Management	CHPE20	Optimization of Chemical Process

Skill Courses

Code No.	Subject Name	Code No.	Subject Name
CHSL1	Employability Skills-I	CHSL2	Employability Skills-II
CHSL3	Industry Standard Coding Practice-I	CHSL4	Industry Standard Coding Practice-II
CHSL5	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
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	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	ECOE1	Applied Electronics
ECOE2	Microprocessors & Interfacing	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)

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 CHEMICAL ENGINEERING

Open Electives (Offered to other Departments)

Code No.	Subject Name	Code No.	Subject Name
CHOE1	Sustainable Engineering	CHOE2	Biofuels

General Minor Course (Offered to other Departments)

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