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

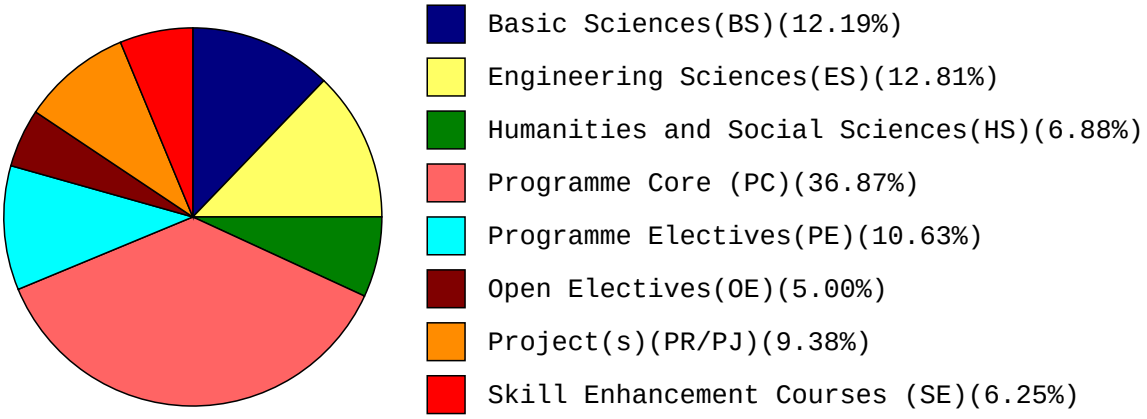
DEPARTMENT OF MECHANICAL ENGINEERING

B.TECH. MECHANICAL 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)	12.19	24	19.5
Engineering Sciences (ES)	12.81	27	20.5
Humanities and / Social Sciences (HS)	6.88	14	11
Professional Core (PC)	36.88	70	59
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. MECHANICAL 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	ME/CE/CH111	Matrices and Calculus	2	1	-	30	70	3.0	BS
2	ME/CE112	Applied Chemistry	3	-	-	30	70	3.0	BS
3	ME/CE/CH/ EC/EE113	Basic Civil and Mechanical Engineering	3	-	-	30	70	3.0	ES
4	ME/CE/CH/ EE114	Programming with C	4	-	-	30	70	4.0	ES
5	ME/CE/CH/ EC/EE115	Communicative English	2	-	-	30	70	2.0	HS
6	ME151	Applied Chemistry Lab	-	-	2	30	70	1.0	BS
7	ME152	Communicative English Lab	-	-	2	30	70	1.0	HS
8	ME153	Programming with C Lab	-	-	3	30	70	1.5	ES
9	ME/CE/CH/ CM/EC/EE154	Health and Wellness, Yoga and Sports	-	-	1	30	70	0.5	BS
		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	ME/CE/CH121	Differential Equations and Vector Calculus	2	1	-	30	70	3.0	BS
2	ME/EC/EE122	Engineering Physics	3	-	-	30	70	3.0	BS
3	ME/CE/CH123	Basic Electrical and Electronics Engineering	3	-	-	30	70	3.0	ES
4	ME124	Engineering Mechanics	2	1	-	30	70	3.0	PC
5	ME125	Engineering Drawing	1	-	4	30	70	3.0	ES
6	ME161	Engineering Physics Lab	-	-	2	30	70	1.0	BS
7	ME162	Basic Electrical and Electronics Engineering Lab	-	-	3	30	70	1.5	ES
8	ME163	Python Programming Lab	-	-	3	30	70	1.5	ES
9	ME/CE/CH/ EC/EE164	Engineering Workshop	-	-	3	30	70	1.5	BS
10	ME165	NSS / NCC / Community Service	-	-	1	30	70	0.5	BS
		TOTAL	**11**	**2**	**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	ME211	Material Science and Metallurgy	3	-	-	30	70	3.0	ES
2	ME212	Strength of Materials	2	1	-	30	70	3.0	PC
3	ME213	Manufacturing processes	3	-	-	30	70	3.0	PC
4	ME214	Basic Thermodynamics	2	1	-	30	70	3.0	PC
5	ME215	Kinematics of Machinery	2	1	-	30	70	3.0	PC
6	ME251	Skill Enhancement Course-1	-	-	4	30	70	2.0	SEC
7	ME/CE/CH/ EC/EE252	Design Thinking and Innovation	1	-	2	30	70	2.0	HS
8	ME253	Machine Drawing with GD & T	-	-	3	30	70	1.5	PC
9	ME254	Modelling Lab	-	-	2	30	70	1.0	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	ME221	Applications of PDE, Numerical Methods, Probability and Statistics	2	1	-	30	70	3.0	BS
2	ME/CE/CH/ EC/EE222	Universal Human Values-II Understanding Harmony	2	-	-	30	70	2.0	HS
3	ME223	Manufacturing Technology	3	-	-	30	70	3.0	PC
4	ME224	Applied Thermodynamics	2	1	-	30	70	3.0	PC
5	ME225	Fluid Mechanics and Hydraulic Machines	2	1	-	30	70	3.0	PC
6	ME226	Operations Management	3	-	-	30	70	3.0	PC
7	ME261	Skill Enhancement Course-2	-	-	4	30	70	2.0	SEC
8	ME262	Manufacturing Process Lab	-	-	2	30	70	1.0	PC
9	ME263	Fluid Mechanics and Strength of Materials Lab	-	-	3	30	70	1.5	PC
10	MC1	Constitution of India	2	-	-	100	-	0.0	MC
		TOTAL	**16**	**3**	**9**	370	630	**21.5**	TPW-28
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	ME311	Design of Machine Elements	2	1	-	30	70	3.0	PC
2	ME312	Machine Dynamics and Vibrations	2	1	-	30	70	3.0	PC
3	ME313	Professional Elective-I	3	-	-	30	70	3.0	PE
4	ME314	Professional Elective-II	3	-	-	30	70	3.0	PE
5	ME315	Open Elective-I	3	-	-	30	70	3.0	OE
6	ME351	Skill Enhancement Course-3	-	1	2	30	70	2.0	SEC
7	ME352	Summer Internship-1	-	-	-	30	70	1.0	PR
8	ME353	Tinkering Lab	-	-	2	30	70	1.0	HS
9	ME354	Thermal Engineering Lab	-	-	2	30	70	1.0	PC
10	ME355	Advanced Modelling Lab	-	-	2	30	70	1.0	PC
		TOTAL	**13**	**3**	**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	ME321	Design of Transmission Elements	2	1	-	30	70	3.0	PC
2	ME322	Operation Research	3	-	-	30	70	3.0	PC
3	ME323	Heat Transfer	2	1	-	30	70	3.0	PC
4	ME324	Professional Elective-III	3	-	-	30	70	3.0	PE
5	ME325	Professional Elective-IV	3	-	-	30	70	3.0	PE
6	ME326	Open Elective-II	3	-	-	30	70	3.0	OE
7	ME361	Skill Enhancement Course-4	-	1	2	30	70	2.0	SEC
8	ME362	Heat Transfer Lab	-	-	2	30	70	1.0	PC
9	ME363	Analysis Lab	-	-	2	30	70	1.0	PC
10	MC3	Technical Paper Writing and IPR	-	-	2	100	-	0.0	MC
		TOTAL	**16**	**3**	**8**	370	630	**22**	TPW-27
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	ME411	Introduction to Industrial Management	3	-	-	30	70	3.0	HS
2	ME412	Metrology and Measurements	3	-	-	30	70	3.0	PC
3	ME413	Professional Elective-V	3	-	-	30	70	3.0	PE
4	ME414	Professional Elective-VI (MOOCs)	-	-	-	-	100	2.0	PE
5	ME415	Open Elective-III (MOOCs)	-	-	-	-	100	2.0	OE
6	ME416	Automation and CAM	3	-	-	30	70	3.0	PC
7	ME451	Skill Enhancement Course-5	-	1	2	30	70	2.0	SEC
8	ME452	Summer Internship-2	-	-	-	30	70	2.0	PR
9	ME453	Design and Metrology Lab	-	-	2	30	70	1.0	PC
10	ME454	CAM Lab	-	-	2	30	70	1.0	PC
		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	ME461	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
MEPE01	Computer Aided Design	MEPE02	Finite Element Method
MEPE03	Advanced Machine Design	MEPE04	Failure Analysis and Design
MEPE05	Fluidics & Control Systems	MEPE06	Mechanics of Composite Materials
MEPE07	Additive Manufacturing Processes and Applications	MEPE08	Advanced Manufacturing Processes
MEPE09	Advances in Composite Materials	MEPE10	Material Characterization
MEPE11	Smart Manufacturing	MEPE12	Advanced Metal Casting
MEPE13	Alternative Fuels & Electric and Hybrid Vehicles	MEPE14	Elements of Aerospace Engineering
MEPE15	Power Plant Engineering	MEPE16	Refrigeration & Air Conditioning
MEPE17	Cryogenics	MEPE18	Automobile Engineering
MEPE19	Fundamentals of Industrial Engineering	MEPE20	Total Quality Management
MEPE21	Process Planning and Cost Estimation	MEPE22	Product Lifecycle Management
MEPE23	Industrial Management	MEPE24	Quality Control & Reliability
MEPE25	AI & Ml in Mechanical Engineering	MEPE26	Industrial Robotics
MEPE27	Mechatronics System Design	MEPE28	Maintenance Engineering
MEPE29	Automotive Sensors		

Skill Courses

Code No.	Subject Name	Code No.	Subject Name
MESL1	Employability Skills-I	MESL2	Employability Skills-II
MESL3	Industry Standard Coding Practice-I	MESL4	Industry Standard Coding Practice-II
MESL5	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
MEHR11	Advanced Strength of Materials	MEHR12	Fracture Mechanics
MEHR13	Design of Manufacturing & Assembly	MEHR14	Advanced Optimization Techniques
MEHR15	Experimental Stress Analysis	MEHR16	Product Design and Development

Pool 2

Code No.	Subject Name	Code No.	Subject Name
MEHR21	Advanced Welding Technology	MEHR22	Advanced Metal Forming
MEHR23	Tool Design	MEHR24	Micro and Nano Manufacturing
MEHR25	Advanced Material Processing	MEHR26	Micro-Electro-Mechanical Systems

Pool 3

Code No.	Subject Name	Code No.	Subject Name
MEHR31	Computational Fluid Dynamics	MEHR32	Gas Dynamics & Jet Propulsion
MEHR33	Energy Conservation and Waste Heat Recovery	MEHR34	Advanced IC Engines
MEHR35	Renewable Energy Systems	MEHR36	Exergy Analysis for Thermal Systems

Pool 4

Code No.	Subject Name	Code No.	Subject Name
MEHR41	Statistical Design & Analysis of Experiments	MEHR42	Production Planning & Control
MEHR43	Supply Chain Management & Logistics	MEHR44	Human Engineering& Ergonomics
MEHR45	Financial Management	MEHR46	Value Engineering

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	ECOE1	Applied Electronics
ECOE2	Microprocessors & Interfacing	EEOE1	Renewable Energy Sources
EEOE2	Utilization of Electrical Energy	ITOE1	Data Structures and Algorithms
ITOE2	Web Technologies		

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 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 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	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 MECHANICAL ENGINEERING

Open Electives (Offered to other Departments)

Code No.	Subject Name	Code No.	Subject Name
MEOE1	Operations Research	MEOE2	Elements of Robotics

General Minor Course (Offered to other Departments)

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		