

GOVERNMENT COLLEGE OF ENGINEERING KARAD

(An Autonomous Institute of Government of Maharashtra)



DEPARTMENT OF MECHANICAL ENGINEERING

**SCHEME OF INSTRUCTION FOR
BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING**

AS PER NEP-2020

W.E.F

AY 2023-24

GOVERNMENT COLLEGE OF ENGINEERING KARAD

(An Autonomous Institute of Government of Maharashtra)

DEPARTMENT OF MECHANICAL ENGINEERING

INSTITUTE VISION

To emerge as a technical Institute of national repute driven by excellence in imparting value based education and innovation in research to face the Global needs of profession.

INSTITUTE MISSION

To create professionally competent engineers driven with the sense of responsibility towards nature and society.

DEPARTMENT VISION

"Be a nationally recognized mechanical engineering department that provides right academic ambience and nurtures innate talent of students"

DEPARTMENT MISSION

"Prepare engineering students for successful career by imparting knowledge, skills & right attitude."

GOVERNMENT COLLEGE OF ENGINEERING KARAD

(An Autonomous Institute of Government of Maharashtra)

DEPARTMENT OF MECHANICAL ENGINEERING

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO1	Solve problems related with mechanical engineering using knowledge of mathematics, basic sciences, mechanical and relevant engineering disciplines and skills developed during graduation studies
PEO2	Demonstrate an understanding about selected specific areas of mechanical engineering as a critical step in career development
PEO3	Function and communicate effectively, both individually and with multidisciplinary teams using professional ethics, social awareness and environmental concern
PEO4	Engage in lifelong learning for successful adaptation to technological changes due to research

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1	Able to exhibit skills to cater industry requirements..
PSO2	Able to create a knowledge through project based learning
PSO3	Able to excel in multidisciplinary environment.

GOVERNMENT COLLEGE OF ENGINEERING KARAD

(An Autonomous Institute of Government of Maharashtra)

DEPARTMENT OF MECHANICAL ENGINEERING

PROGRAMME OUTCOMES (PO)

PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	Problem analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Government College of Engineering, Karad

SCHEME OF INSTRUCTION & SYLLABI

Programme: B.Tech. Mechanical Engineering

Scheme of Instructions: First Year B. Tech. in Mechanical Engineering

Semester – I (w.e.f. 2023-24)

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Course Credits	EXAM SCHEME			
									MSE	ISE	ESE	TOTAL
1	BSC	ME3101	Applied Mathematics - I	3	1	-	4	4	20	20	60	100
2	BSC	ME3102	Applied Physics	3	-	-	3	3	20	20	60	100
3	PCC	ME3103	Basic Mechanical Engineering	3	-	-	3	3	20	20	60	100
4	ESC	ME3104	Applied Mechanics	3	-	-	3	3	20	20	60	100
5	ESC	ME3105	Design Thinking	1	-	2	3	2	-	50	-	50
6	BSC	ME3106	Applied Physics Lab	-	-	2	2	1	-	25	-	25
7	PCC	ME3107	Basic Mechanical Engineering Lab	-	-	2	2	1	-	50	25	75
8	HSSM	ME3108	Professional Communication Skills	1	-	2	3	2	-	50	25	75
9	ESC	ME3109	Applied Mechanics Lab	-	-	2	2	1	-	25	-	25
10	CCA	ME3110	Yoga	-	-	2	2	1	-	50	-	50
11	VSEC	ME3111	Workshop practice I	-	-	2	2	1	-	50	50	100
			Total	14	1	14	27	22	80	380	340	800

L- Lecture

T-Tutorial

P-Practical

MSE- Mid Semester Examination

ISE - In Semester Evaluation

ESE- End Semester Examination (For Laboratory, End Semester performance)

Course Category	Basic Science Courses (BSC)	Engineering Science Courses (ESC)	Programme Core Course (PCC)	Programme Elective Course (PEC)	Open Elective other than particular program (OE/MDM)	Vocational and Skill Enhancement Course (VSEC)	Humanities Social Science and Management (HSSM)	Experiential Learning (EL)	Co-curricular And Extracurricular Activities (CCA)
Credits	08	6	4	-	-	01	02	-	01
Cumulative Sum	08	6	4	-	-	01	02	-	01

PROGRESSIVE TOTAL CREDITS: 22

Government College of Engineering, Karad

SCHEME OF INSTRUCTION & SYLLABI

Programme: B.Tech. Mechanical Engineering

Scheme of Instructions: First Year B. Tech. in Mechanical Engineering

Semester – II (w.e.f. 2023-24)

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Course Credits	EXAM SCHEME			
									MSE	ISE	ESE	TOTAL
1	BSC	ME3201	Applied Mathematics - II	3	1	-	4	4	20	20	60	100
2	BSC	ME3202	Applied Chemistry	3	-	-	3	3	20	20	60	100
3	ESC	ME3203	Engineering Graphics	3	-	-	3	3	20	20	60	100
4	ESC	ME3204	Basic Electrical & Electronics	3	-	-	3	3	20	20	60	100
5	HSSM	ME3205	Indian Knowledge Systems (MOOC)	-	-	-	-	2	-	-	100	100
6	ESC	ME3206	Programming For Problem Solving	2	-	-	2	2	20	20	60	100
7	BSC	ME3207	Applied Chemistry Lab	-	-	2	2	1	-	25	-	25
8	ESC	ME3208	Engineering Graphics Lab	-	-	2	2	1	-	50	-	50
9	ESC	ME3209	Programming for Problem Solving Lab	-	-	2	2	1	-	25	-	25
10	CCA	ME3210	NCC/NSS/CSP/E-Cell activity	-	-	2	2	1	-	50	-	50
11	VSEC	ME3211	Workshop II	-	-	2	2	1	-	25	25	50
			Total	14	1	10	27	22	100	275	425	800

L- Lecture

T-Tutorial

P-Practical

MSE- Mid Semester Examination

ISE- In Semester Evaluation

ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	Basic Science Courses (BSC)	Engineering Science Courses (ESC)	Programme Core Course (PCC)	Programme Elective Course (PEC)	Open Elective other than particular program (OE/MDM)	Vocational and Skill Enhancement Course (VSEC)	Humanities Social Science and Management (HSSM)	Experiential Learning (EL)	Co-curricular And Extracurricular Activities (CCA)
Credits	08	10	-	-	-	01	02	-	01
Cumulative Sum	16	16	4	-	-	02	04	-	02

PROGRESSIVE TOTAL CREDITS: 22+22 =44

Government College of Engineering, Karad

SCHEME OF INSTRUCTION

Programme: Mechanical Engineering

Scheme of Instructions: **UG Certificate Level**

(EXIT COURSE after FY of Engineering)

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs / Wk	Course Credits	Mode of Learning
1	EL (INTR)	ME-EC-0101	Industrial Training / Internship *	-	-	-	-	4	Offline
2	PCC	ME-EC-0102	Machine Maintenance Lab	-	-	8	8	4	Offline
		OR							
		ME-EC-0103	Vehicle Maintenance Lab	-	-	8	8	4	Offline
		OR							
		ME-EC-0104	Modelling and Drafting Lab	-	-	8	8	4	Offline
			Total					08	

*Industrial Training of 4 weeks duration

Government College of Engineering, Karad

SCHEME OF INSTRUCTION & SYLLABI

Programme: B.Tech. Mechanical Engineering

Scheme of Instructions: Second Year B. Tech. in Mechanical Engineering

Semester – III (w.e.f. 2024-25)

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Course Credits	EXAM SCHEME			
									MSE	ISE	ESE	TOTAL
1	BSC	ME3301	Mathematics for Mechanical Engineering	2	-	-	2	2	20	20	60	100
2	PCC	ME3302	Engineering Thermodynamics	3	-	-	3	3	20	20	60	100
3	PCC	ME3303	Material Engineering	3	-	-	3	3	20	20	60	100
4	MDM	##	Multi-disciplinary Minor - 01	2	-	-	2	2	20	20	60	100
5	OE	\$D/O/I	Open Elective -01	3	--	--	3	3	20/NA/NA	20/NA/50	60/100/50	100
6	HSSM	ME3306	Universal Human Values	2	-	-	2	2	-	50	-	50
7	HSSM	ME3307	Economics for Engineers	2	-	-	2	2	-	50	-	50
8	PCC	ME3308	Engineering Thermodynamics Lab	-	-	2	2	1	-	25	25	50
9	PCC	ME3309	Material Engineering Lab	-	-	2	2	1	-	25	25	50
10	PCC	ME3310	Machine Drawing Lab	-	-	2	2	1	-	25	-	25
11	VSEC	ME3311	Workshop Practice – III	-	-	2	2	1	-	25	-	25
12	OE	\$D/O/I	Open Elective -01 Lab	-	-	2	2	1	-	25	25	50
			Total	17	0	10	27	22	100	325	375	800

***Note: Open Elective-01 can be offered as Offline or Online mode (MOOC)**

##:- any course offered from Department/Institute level MDM bucket

Note: \$ D/O/I- Any course offered by Department/Online/Institute OE bucket.

L- Lecture

T-Tutorial

P-Practical

MSE- Mid Semester Examination

ISE- In Semester Evaluation

ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	Basic Science Courses (BSC)	Engineering Science Courses (ESC)	Programme Core Course (PCC)	Programme Elective Course (PEC)	Open Elective other than particular (OE/MDM)	Vocational and Skill Enhancement Course (VSEC)	Humanities Social Science and Management (HSSM)	Experiential Learning (EL)	Co-curricular And Extracurricular Activities (CCA)
Credits	02	-	9	-	6	01	04	-	-
Cumulative Sum	18	16	13	-	6	03	08	-	02

PROGRESSIVE TOTAL CREDITS: 44+22 =66

Government College of Engineering, Karad

SCHEME OF INSTRUCTION & SYLLABI

Programme: B.Tech. Mechanical Engineering

Scheme of Instructions: Second Year B. Tech. in Mechanical Engineering

Semester – IV (w.e.f. 2024-25)

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Course Credits	EXAM SCHEME			
									MSE	ISE	ESE	TOTAL
1	PCC	ME3401	Fluid Mechanics & Machines	3	-	-	3	3	20	20	60	100
2	PCC	ME3402	Strength of Materials	3	-	-	3	3	20	20	60	100
3	PCC	ME3403	Numerical Methods	2	-	-	2	2	20	20	60	100
4	PCC	ME3404	Machine Tools and Processes	3	-	-	3	3	20	20	60	100
5	MDM	##	Multi-disciplinary Minor - 02	2	-	-	2	2	20	20	60	100
6	OE	\$D/O/I	Open Elective -02	2	--	--	2	2	20/NA/NA	20/NA/50	60/100/50	100
7	HSSM	ME3407	Strategic Management	2	-	-	2	2	-	25	-	25
8	HSSM	ME3408	Professional Ethics	2	-	-	2	2	-	25	-	25
9	PCC	ME3409	Computer Aided Drafting Lab	-	-	2	2	1	-	25	25	50
10	PCC	ME3410	Fluid Mechanics & Machines Lab	-	-	2	2	1	-	25	25	50
11	EL	ME3411	Community Engagement Project	-	-	2	2	1	-	50	-	50
12	BSC	ME3412	Environmental Science	2	-	-	2	Audit	-	-	-	-
			Total	21	0	6	27	22	120	270	410	800

***Note: Open Elective-02 can be offered as Offline or Online mode (MOOC)**

##:- any course offered from Department/Institute level MDM bucket

Note: \$ D/O/I- Any course offered by Department/Online/Institute OE bucket.

L- Lecture

T-Tutorial

P-Practical

MSE- Mid Semester Examination

ISE- In Semester Evaluation

ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	Basic Science Courses (BSC)	Engineering Science Courses (ESC)	Programme Core Course (PCC)	Programme Elective Course (PEC)	Open Elective other than particular program (OE/MDM)	Vocational and Skill Enhancement Course (VSEC)	Humanities Social Science and Management (HSSM)	Experiential Learning (EL)	Co-curricular And Extracurricular Activities (CCA)
Credits	-	-	13	-	04	-	04	01	-
Cumulative Sum	18	16	26	-	10	03	12	01	02

PROGRESSIVE TOTAL CREDITS: 66+22 =88

Government College of Engineering, Karad

SCHEME OF INSTRUCTION

Programme: Mechanical Engineering

Scheme of Instructions : **UG Diploma Level**
(EXIT COURSE after SY of Engineering)

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs / Wk	Course Credits	Mode of Learning
1	EL (INTR)	ME-EC-0201	Industrial Training / Internship *	-	-	-	-	4	Offline
2	PCC	ME-EC-0202	Computer Aided Drafting Lab (Solid works, Catia)	-	-	8	8	4	Offline
		OR							
		ME-EC-0203	Workshop (CNC operations Lab)	-	-	8	8	4	Offline
			Total					08	

*Industrial training of 4 week duration

Government College of Engineering, Karad

SCHEME OF INSTRUCTION & SYLLABI

Programme: Mechanical Engineering

Scheme of Instructions: Third Year B. Tech. in Mechanical Engineering

Semester – V (w.e.f. 2025-26)

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Course Credits	EXAM SCHEME			
									MSE	ISE	ESE	TOTAL
1	PCC	ME3501	Manufacturing and Automation	3	--	--	3	3	20	20	60	100
2	PCC	ME3502	Heat Transfer	3	--	--	3	3	20	20	60	100
3	PCC	ME3503	Machine Design	3	1	--	4	4	20	20	60	100
4	PEC	ME35*4	Programme Elective - 01	3	--	--	3	3	20	20	60	100
5	MDM	##	Multi-disciplinary Minor - 03	3	--	--	3	3	20	20	60	100
6	OE	\$D/O/I	Open Elective -03	2	--	--	2	2	20/NA/NA	20/NA/50	60/100/50	100
7	PCC	ME3507	Heat Transfer Lab	--	--	2	2	1	-	25	-	25
8	PEC	ME35*8	Programme Elective – 01 Lab	--	--	2	2	1	-	25	-	25
9	MDM	##	Multi-disciplinary Minor – 03 Lab	--	--	2	2	1	-	50	-	50
10	VSEC	ME 3510	Computer Integrated Manufacturing Lab	--	--	2	2	1	-	50	50	100
			Total	17	1	8	26	22	120	270	410	800

***Note: Open Elective-03 can be offered as Offline or Online mode (MOOC)**

##:- any course offered from Department/Institute level MDM bucket

\$ D/O/I- Any course offered by Department/Online/Institute OE bucket.

L- Lecture

T-Tutorial

P-Practical

MSE- Mid Semester Examination

ISE- In Semester Evaluation

ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	Basic Science Courses (BSC)	Engineering Science Courses (ESC)	Programme Core Course (PCC)	Programme Elective Course (PEC)	Open Elective other than particular program (OE/MDM)	Vocational and Skill Enhancement Course (VSEC)	Humanities Social Science and Management (HSSM)	Experiential Learning (EL)	Co-curricular And Extracurricular Activities (CCA)
Credits	-	-	11	4	6	1	-	-	-
Cumulative Sum	18	16	37	4	16	04	12	01	02

PROGRESSIVE TOTAL CREDITS: 88+22=110

Government College of Engineering, Karad

SCHEME OF INSTRUCTION & SYLLABI

Programme: Mechanical Engineering

Scheme of Instructions: Third Year B. Tech. in Mechanical Engineering

Semester – VI (w.e.f. 2025-26)

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Course Credits	EXAM SCHEME			
									MSE	ISE	ESE	TOTAL
1	PCC	ME3601	Control Engineering	3	--	--	3	3	20	20	60	100
2	PCC	ME3602	Kinematics and Dynamics of Machine	3	--	--	3	3	20	20	60	100
3	PCC	ME3603	Industrial Automation and Robotics	3	--	--	3	3	20	20	60	100
4	PCC	ME3604	Measurement and Metrology	3	--	--	3	3	20	20	60	100
5	PEC	ME36*5	Programme Elective - 02	3	--	--	3	3	20	20	60	100
6	MDM	##	Multi-disciplinary Minor - 04	2	--	--	2	2	20	20	60	100
7	PCC	ME3607	Control Engineering Lab	--	--	2	2	1	-	25	25	50
8	PCC	ME3608	Kinematics and Dynamics of Machine Lab	--	--	2	2	1	-	25	25	50
9	PCC	ME3609	Industrial Automation and Robotics Lab	--	--	2	2	1	-	25	-	25
10	PCC	ME3610	Measurement and Metrology Lab	--	--	2	2	1	-	25	-	25
11	EL	ME3611	Minor Project	--	--	2	2	1	-	50	-	50
			Total	17	0	10	27	22	120	270	410	800

##:- Any Course offered from Dept. /Inst. level MDM buckets.

L- Lecture

T-Tutorial

P-Practical

MSE- Mid Semester Examination

ISE- In Semester Evaluation

ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	Basic Science Courses (BSC)	Engineering Science Courses (ESC)	Programme Core Course (PCC)	Programme Elective Course (PEC)	Open Elective other than particular (OE/MDM)	Vocational and Skill Enhancement Course (VSEC)	Humanities Social Science and Management (HSSM)	Experiential Learning (EL)	Co-curricular And Extracurricular Activities (CCA)
Credits	-	-	16	3	2	-	-	01	-
Cumulative Sum	18	16	53	7	18	04	12	02	02

PROGRESSIVE TOTAL CREDITS: 110+22 =132

Government College of Engineering, Karad

SCHEME OF INSTRUCTION

Programme: Mechanical Engineering

Scheme of Instructions: **UG Degree Level**

(EXIT COURSE after TY of Engineering)

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs / Wk	Course Credits	Mode of Learning
1	EL (INTR)	ME-EC-0301	Industrial Training / Internship *	-	-	-	-	4	Offline
2	PCC	ME-EC-0302	Computer Aided Engineering Lab (ANSYS and MATLAB)	-	-	8	8	4	Offline
		OR							
		ME-EC-0303	Workshop (Non-conventional machining)	-	-	8	8	4	Offline
			Total					08	

*Industrial training of 4 weeks duration

Government College of Engineering, Karad

SCHEME OF INSTRUCTION & SYLLABI

Programme: Mechanical Engineering

Scheme of Instructions: Final Year B. Tech. in Mechanical Engineering

Semester – VII (w.e.f. 2026-27)

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Course Credits	EXAM SCHEME			
									MSE	ISE	ESE	TOTAL
1	PCC	ME3701	Refrigeration and Air Conditioning	3	--	--	3	3	20	20	60	100
2	PCC	ME3702	Finite Element Analysis	3	--	--	3	3	20	20	60	100
3	PEC	ME37*3	Programme Elective - 03	3	--	--	3	3	20	20	60	100
4	EL	ME3704	Research Methodology	3	--	--	3	3	20	20	60	100
5	MDM	##	Multi-disciplinary Minor - 05	2	--	--	2	2	20	20	60	100
6	PCC	ME3706	Finite Element Analysis Lab	--	--	2	2	1	--	25	25	50
7	EL	ME3707	Seminar	--	--	2	2	1	--	25	--	25
8	EL	ME3708	Industrial Training	--	--	2	2	1	--	25	--	25
9	EL	ME3709	Project Phase I	--	--	10	10	5	--	100	100	200
			Total	14	0	16	30	22	100	275	425	800

##:- Any Course offered from Dept. /Inst. level MDM buckets.

L- Lecture

T-Tutorial

P-Practical

MSE- Mid Semester Examination

ISE- In Semester Evaluation

ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	Basic Science Courses (BSC)	Engineering Science Courses (ESC)	Programme Core Course (PCC)	Programme Elective Course (PEC)	Open Elective other than particular program (OE/MDM)	Vocational and Skill Enhancement Course (VSEC)	Humanities Social Science and Management (HSSM)	Experiential Learning (EL)	Co-curricular And Extracurricular Activities (CCA)
Credits	-	-	7	3	2	-	-	07	-
Cumulative Sum	18	16	60	10	20	04	12	09	02

PROGRESSIVE TOTAL CREDITS: 132+22 =154

Government College of Engineering, Karad

SCHEME OF INSTRUCTION & SYLLABI

Programme: Mechanical Engineering

Scheme of Instructions: Final Year B. Tech. in Mechanical Engineering

Semester – VIII (Academic Mode) (w.e.f. 2026-27)

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Course Credits	EXAM SCHEME			
									MSE	ISE	ESE	TOTAL
1	PCC	ME3801	Mechatronics	3	--	--	3	3	20	20	60	100
2	PCC	ME3802	Noise and Vibration	3	--	--	3	3	20	20	60	100
3	PEC	ME38*3	Programme Elective - 04	2	--	--	2	2	20	20	60	100
4	PEC	ME38*4	Programme Elective - 05	3	--	--	3	3	20	20	60	100
5	MDM	##	Multi-disciplinary Minor - 06	2	--	--	2	2	20	20	60	100
6	PCC	ME3806	Mechatronics Lab	--	--	2	2	1	--	50	50	100
7	EL	ME3807	Project Phase II	--	--	16	16	8	--	100	100	200
			Total	13	0	18	31	22	100	250	450	800

##:- Any Course offered from Dept. /Inst. level MDM buckets.

L- Lecture

T-Tutorial

P-Practical

MSE- Mid Semester Examination

ISE- In Semester Evaluation

ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	Basic Science Courses (BSC)	Engineering Science Courses (ESC)	Programme Core Course (PCC)	Programme Elective Course (PEC)	Open Elective other than particular program (OE/MDM)	Vocational and Skill Enhancement Course (VSEC)	Humanities Social Science and Management (HSSM)	Experiential Learning (EL)	Co-curricular And Extracurricular Activities (CCA)
Credits	-	-	7	5	2	-	-	08	-
Cumulative Sum	18	16	67	15	22	04	13	17	02

PROGRESSIVE TOTAL CREDITS: 154+22 =176

Government College of Engineering, Karad

SCHEME OF INSTRUCTION & SYLLABI

Programme: Mechanical Engineering

Scheme of Instructions: Final Year B. Tech. in Mechanical Engineering

Semester – VIII (Industry Mode) (w.e.f. 2026-27)

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Course Credits	EXAM SCHEME			
									MSE	ISE	ESE	TOTAL
1	MOOC (PEC)	ME3808	MOOC – I	-	-	-	-	4	-	-	100	100
2	MOOC (PEC)	ME3809	MOOC – II	-	-	-	-	4	-	-	100	100
3	MDM	##	Multi-disciplinary Minor – 06 (MOOC)	--	--	--	--	2	-	-	100	100
4	EL	ME3811	Industry Project	--	--	--	-	12	-	250	250	500
Total				0	0	0	0	22	0	250	550	800

##:- Any Course offered from Dept. /Inst. level MDM buckets.

L- Lecture

T-Tutorial

P-Practical

MSE- Mid Semester Examination

ISE- In Semester Evaluation

ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	Basic Science Courses (BSC)	Engineering Science Courses (ESC)	Programme Core Course (PCC)	Programme Elective Course (PEC)	Open Elective other than particular program (OE/MDM)	Vocational and Skill Enhancement Course (VSEC)	Humanities Social Science and Management (HSSM)	Experiential Learning (EL)	Co-curricular And Extracurricular Activities (CCA)
Credits	-	-	-	8	2	-	-	12	-
Cumulative Sum	18	16	60	18	22	04	13	21	02

PROGRESSIVE TOTAL CREDITS: 154+22 =176

Government College of Engineering, Karad

SCHEME OF INSTRUCTION & SYLLABI

Programme: Mechanical Engineering

Scheme of Instructions: Final Year B. Tech. in Mechanical Engineering

Semester – VIII (Research Mode) (w.e.f. 2026-27)

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Course Credits	EXAM SCHEME			
									MSE	ISE	ESE	TOTAL
1	MOOC (PEC)	ME3812	MOOC – I	-	-	-	-	4	-	-	100	100
2	MOOC (PEC)	ME3813	MOOC – II	-	-	-	-	4	-	-	100	100
5	MDM	##	Multi-disciplinary Minor – 06 (MOOC)	2	-	-	2	2	20	20	60	100
3	EL	ME3815	Research Project	-	-	24	24	12	-	250	250	500
			Total	2	0	24	26	22	20	270	510	800

##:- Any Course offered from Dept. /Inst. level MDM buckets.

L- Lecture

T-Tutorial

P-Practical

MSE- Mid Semester Examination

ISE- In Semester Evaluation

ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	Basic Science Courses (BSC)	Engineering Science Courses (ESC)	Programme Core Course (PCC)	Programme Elective Course (PEC)	Open Elective other than particular program (OE/MDM)	Vocational and Skill Enhancement Course (VSEC)	Humanities Social Science and Management (HSSM)	Experiential Learning (EL)	Co-curricular And Extracurricular Activities (CCA)
Credits	-	-	-	8	2	-	-	12	-
Cumulative Sum	18	16	60	18	22	04	13	21	02

PROGRESSIVE TOTAL CREDITS: 154+22 =176

Basket of Basic Sciences Courses (BSC)

List of BSC courses offered Semester wise						
Semester I						
Sr.	Course Code	Course	L	T	P	Credits
1	ME3101	Applied Mathematics - I	3	1	--	4
2	ME3102	Applied Physics	3	--	--	3
3	ME3106	Applied Physics Lab	--	--	2	1
Semester II						
4	ME3201	Applied Mathematics - II	3	1	--	4
5	ME3202	Applied Chemistry	3	--	--	3
6	ME3207	Applied Chemistry Lab	--	--	2	1
Semester III						
7	ME3301	Mathematics for Mechanical Engineering	2	-	-	2
Semester IV						
8	ME3411	Environmental Science	2	-	-	Audit
TOTAL						18

Basket of Engineering Sciences Courses (ESC)

List of ESC courses offered Semester wise						
Semester I						
Sr.	Course Code	Course	L	T	P	Credits
1	ME3104	Applied Mechanics	3	--	--	3
2	ME3105	Design Thinking	2	--	--	2
3	ME3109	Applied Mechanics Lab	-	-	2	1
Semester II						
4	ME3203	Engineering Graphics	3	--	--	3
5	ME3204	Basic Electrical & Electronics	3	--	--	3
6	ME3206	Programming For Problem Solving	2	--	--	2
7	ME3208	Engineering Graphics Lab	--	--	2	1
8	ME3209	Programming for Problem Solving Lab	-	-	2	1
TOTAL						16

Basket of Programme Core Courses (PCC)

List of PCC courses offered Semester wise						
Semester I						
Sr.	Course Code	Course	L	T	P	Credits
1	ME3103	Basic Mechanical Engineering	3	-	-	3
2	ME3107	Basic Mechanical Engineering Lab	-	-	2	1
Semester III						
3	ME3302	Engineering Thermodynamics	3	-	-	3
4	ME3303	Material Engineering	3	-	-	3
5.	ME3308	Engineering Thermodynamics Lab	-	-	2	1
6	ME3309	Material Engineering Lab	-	-	2	1
7	ME3310	Machine Drawing Lab	-	-	2	1
Semester IV						
8	ME3401	Fluid Mechanics & Machines	3	-	-	3
9	ME3402	Strength of Materials	3	-	-	3
10	ME3403	Numerical Methods	2	-	-	2
11	ME3404	Machine Tools and Processes	3	-	-	3
12	ME3409	Computer Aided Drafting Lab	-	-	2	1
13	ME3410	Fluid Mechanics & Machines Lab	-	-	2	1
Semester V						
14	ME3501	Manufacturing and Automation	3	-	-	3
15	ME3502	Heat Transfer	3	-	-	3

16	ME3503	Machine Design	3	1	-	4
17	ME3507	Heat Transfer Lab	-	-	2	1
Semester VI						
18	ME3601	Control Engineering	3	-	-	3
19	ME3602	Kinematics and Dynamics of Machine	3	-	-	3
20	ME3603	Industrial Automation and Robotics	3	-	-	3
21	ME3604	Measurement and Metrology	3	-	-	3
22	ME3607	Control Engineering Lab	-	-	2	1
23	ME3608	Kinematics and Dynamics of Machine Lab	-	-	2	1
24	ME3609	Industrial Automation and Robotics Lab	-	-	2	1
25	ME3610	Measurement and Metrology Lab	-	-	2	1
Semester VII						
26	ME3701	Refrigeration and Air Conditioning	3	-	-	3
27	ME3702	Finite Element Analysis	3	-	-	3
28	ME3706	Finite Element Analysis Lab	-	-	2	1
Semester VIII						
29	ME3801	Mechatronics	3	-	-	3
30	ME3802	Noise and Vibration	3	-	-	3
31	ME3806	Mechatronics Lab	-	-	2	1
TOTAL						67

Faculty-wise basket of Programme Elective Courses (PEC)

	Elective 01 (Sem. V)	Elective 02 (Sem. VI)	Elective 03 (Sem. VII)	Elective 04 (Sem. VIII)	Elective 05 (Sem. VIII)
Thermal and Power	ME3514: Industrial Fluid Power	ME3615: Internal Combustion Engines	ME3713: Energy and power Engineering	ME3813: Computational Fluid Dynamics	ME3814: Automobile Engineering
Design	ME3524: Industrial Instrumentation	ME3625: Failure Analysis	ME3723: Mechanical System Design	ME3823: Tribology	ME3824: MEMS & NEMS
Production	ME3534: Advanced Casting Technology	ME3635: Additive Manufacturing	ME3733: Non-Conventional Machining	ME3833: Condition Monitoring	ME3834: Welding Technology
Management	ME3544: Operations Research	ME3645: Process Planning & Cost Estimation	ME3743: Industrial Engineering	ME3843: Total Quality Management	ME3834: Supply Chain and Logistics

List of Multi-disciplinary Minor (Departmental)

Offered by Department	Sr. No.	Course category	Course code & Title	Semester
Civil Engineering	1	Multi-disciplinary Minor - 01	CE3305: Basic civil engineering	III
	2	Multi-disciplinary Minor – 02	CE3404: Building materials	IV
	3	Multi-disciplinary Minor – 03	CE3505: Building planning and drawing	V
	4	Multi-disciplinary Minor Lab – 03	CE3510: Building planning and drawing lab	V
	5	Multi-disciplinary Minor – 04	CE3606: Building services	VI
	6	Multi-disciplinary Minor – 05	CE3705: Smart building I	VII
	7	Multi-disciplinary Minor - 06	CE3805: Smart building II	VIII
Mechanical Engineering	1	Multi-disciplinary Minor - 01	ME3304: Material Science	III
	2	Multi-disciplinary Minor – 02	ME3405: Analysis of Mechanical elements	IV
	3	Multi-disciplinary Minor – 03	ME3505: Thermal Engineering	V
	4	Multi-disciplinary Minor Lab – 03	ME3509: Mechanical Engineering Lab	V
	5	Multi-disciplinary Minor – 04	ME3606: Manufacturing Engineering	VI
	6	Multi-disciplinary Minor – 05	ME3705: Energy Conservation and Management	VII
	7	Multi-disciplinary Minor - 06	ME3805: Mechanical System Design	VIII
Electrical Engineering	1	Multi-disciplinary Minor - 01	EE3304: DC Machines and Transformers	III
	2	Multi-disciplinary Minor – 02	EE3404: AC Machines	IV
	3	Multi-disciplinary Minor – 03	EE3505: Basics of Power System	V
	4	Multi-disciplinary Minor Lab – 03	EE3510: Electrical Machine Lab	V
	5	Multi-disciplinary Minor – 04	EE3606: Electrical Drives	VI
	6	Multi-disciplinary Minor – 05	EE3705: Switchgear and Protection	VII
	7	Multi-disciplinary Minor - 06	EE3805: Energy Management and Audit /Electrical Vehicle	VIII

Information Technology	1	Multi-disciplinary Minor - 01	IT3305: Basics of Data Structure	III
	2	Multi-disciplinary Minor – 02	IT3404:Software Essentials (OS and Application Software)	IV
	3	Multi-disciplinary Minor – 03	IT3505:Database Management Systems	V
	4	Multi-disciplinary Minor Lab – 03	IT3511:Database Management Systems Lab	V
	5	Multi-disciplinary Minor – 04	IT3604:Basics of AI and ML	VI
	6	Multi-disciplinary Minor – 05	IT3705:Python Programming	VII
	7	Multi-disciplinary Minor - 06	IT3805:Web Technology	VIII
Electronics & Telecommunications Engineering	1	Multi-disciplinary Minor - 01	EX3304: Electronic Circuits	III
	2	Multi-disciplinary Minor – 02	EX3404: Digital Electronics	IV
	3	Multi-disciplinary Minor – 03	EX3505: Signals & Systems	V
	4	Multi-disciplinary Minor Lab – 03	EX3510: Signals & Systems Laboratory	V
	5	Multi-disciplinary Minor – 04	EX3606: Communication System	VI
	6	Multi-disciplinary Minor – 05	EX3706: Microprocessor & Microcontroller	VII
	7	Multi-disciplinary Minor - 06	EX3805: Mobile Communication	VIII

List of Multi-disciplinary Minor (Institute Level-Industrial)

Stream/Technology	Sr.No.	Course category	Course code & Title	Semester
Electrical Vehicle (Electrical Engineering- Institute Level-Industrial)	1	Multi-disciplinary Minor - 01	IMI3311: Foundation of EV and Hybrid Vehicle	III
	2	Multi-disciplinary Minor – 02	IMI3412: EV Battery Technology and Powertrain Development	IV
	3	Multi-disciplinary Minor – 03	IMI3513: EV Power Electronics and Embedded System	V
	4	Multi-disciplinary Minor Lab – 03	IMI3514: Electric Vehicle Lab	V
	5	Multi-disciplinary Minor – 04	IMI3615: EV Charging Infrastructure, Vehicle Testing & Homologation	VI
	6	Multi-disciplinary Minor – 05	IMI3716: EV Vehicle Design, Analysis and Control	VII
	7	Multi-disciplinary Minor - 06	IMI3817: EV PCB Design & Data Analytics	VIII
Image Processing (ETC- Institute Level-Industrial)	1	Multi-disciplinary Minor - 01	IMI3321: Fundamentals of Image.	III
	2	Multi-disciplinary Minor – 02	IMI3422: Basics of Image Processing for Healthcare	IV
	3	Multi-disciplinary Minor – 03	IMI3523: Particle Size Analysis using Image Processing	V
	4	Multi-disciplinary Minor Lab – 03	IMI3524: Particle Size Analysis using Image Processing Lab	V
	5	Multi-disciplinary Minor – 04	IMI3625: Particle Characterization in Healthcare	VI
	6	Multi-disciplinary Minor – 05	IMI3726: Particle Characterization in Formulation and Reverse Engineering	VII
	7	Multi-disciplinary Minor - 06	IMI3827: Project	VIII
Electrical Vehicle (Mechanical Engineering- Institute Level-Industrial)	1	Multi-disciplinary Minor - 01	IMI3331: Foundation of EV and Hybrid Vehicle	III
	2	Multi-disciplinary Minor – 02	IMI3432: Automotive Mechanics for EV	IV
	3	Multi-disciplinary Minor – 03	IMI3533: EV Design, Development, Analysis and Control	V
	4	Multi-disciplinary Minor Lab – 03	IMI3534: 3D modelling and simulation Lab	V
	5	Multi-disciplinary Minor – 04	IMI3635: EV Product Development, Homologation and Hydrogen FCEV	VI
	6	Multi-disciplinary Minor – 05	IMI3736: EV FEA Analysis	VII
	7	Multi-disciplinary Minor - 06	IMI3837: Cyber Security and Data Analysis	VIII

List of Multi-disciplinary Minor (Institute Level-Other Discipline)

Offered by Department	Sr. No.	Course category	Course code & Title	Semester
Law	1	Multi-disciplinary Minor - 01	IMO3311: Constitutional Law	III
	2	Multi-disciplinary Minor – 02	IMO3412: Human Rights & International Law	IV
	3	Multi-disciplinary Minor – 03	IMO3513: Environmental Law	V
	4	Multi-disciplinary Minor Lab – 03	IMO3514: Environmental Law Field Study	V
	5	Multi-disciplinary Minor – 04	IMO3615: Civil Procedure Code (CPC)	VI
	6	Multi-disciplinary Minor – 05	IMO3716: Intellectual Property Law	VII
	7	Multi-disciplinary Minor - 06	IMO3817: Cyber Law	VIII
Management & Finance	1	Multi-disciplinary Minor - 01	IMO3321: Microeconomics	III
	2	Multi-disciplinary Minor – 02	IMO3422: Corporate Social Responsibility	IV
	3	Multi-disciplinary Minor – 03	IMO3523: Principles of Accounting	V
	4	Multi-disciplinary Minor Lab – 03	IMO3524: Principles of Accounting Lab	V
	5	Multi-disciplinary Minor – 04	IMO3625: Business Intelligence	VI
	6	Multi-disciplinary Minor – 05	IMO3726: Marketing Research	VII
	7	Multi-disciplinary Minor - 06	IMO3827: Corporate Governance and Business Ethics	VIII

List of Open Electives (OE) - Departmental

1. Civil Engineering Department

List of Open Elective (Offline Mode)

Open Elective	Course Code	Course Title
Open Elective-I	CE3316	Environmental Chemistry
Open Elective-I lab	CE3321	Environmental Chemistry Lab
Open Elective-II	CE3415	Project Management
Open Elective-III	CE3516	Environmental Impact Assessment

List of Open Elective (MOOCs Mode)

Open Elective	Course Code	Course Title
Open Elective-I	CE3326	Environmental Chemistry
Open Elective-I lab	CE3331	Environmental Chemistry Lab
Open Elective-II	CE3425	Project Management
Open Elective-III	CE3526	Environmental Impact Assessment

2. Mechanical Engineering Department

List of Open Elective (Offline Mode)

Open Elective	Course Code	Course Title
Open Elective-I	ME3315	Industrial Instrumentation
Open Elective-I lab	ME3312	Industrial Instrumentation Lab
Open Elective-II	ME3416	Industrial Safety
Open Elective-III	ME3516	Entrepreneurship Development

List of Open Elective (MOOCs Mode)

Open Elective	Course Code	Course Title
Open Elective-I	ME3325	Control systems
Open Elective-I lab	ME3322	Instrumentation and Control Lab
Open Elective-II	ME3426	Industrial Safety
Open Elective-III	ME3526	Entrepreneurship

3. Electrical Engineering Department**List of Open Elective (Offline Mode)**

Open Elective	Course Code	Course Title
Open Elective-I	EE3315	Sustainable Energy Systems
Open Elective-I lab	EE3316	Sustainable Energy Systems Lab
Open Elective-II	EE3417	Robotics and Automation
Open Elective-III	EE3518	Optimization Techniques or Electrical vehicle system

List of Open Elective (MOOCs Mode)

Open Elective	Course Code	Course Title
Open Elective-I	EE3325	Energy Systems Engineering
Open Elective-I lab	EE3326	Energy Systems Engineering Lab
Open Elective-II	EE3427	Power System Engineering
Open Elective-III	EE3528	Optimization Techniques

4. Electronics & Telecommunications Engineering Department

List of Open Elective (Offline Mode)

Open Elective	Course Code	Course Title
Open Elective-I	EX3315	Digital System Design
Open Elective-I lab	EX3310	Digital System Design Laboratory
Open Elective-II	EX3415	Microcontroller and Interfacing
Open Elective-III	EX3516	Embedded Systems and RTOS

List of Open Elective (MOOCs Mode)

Open Elective	Course Code	Course Title
Open Elective-I	EX3325	Digital Electronics
Open Elective-I lab	EX3320	Digital Electronics Laboratory
Open Elective-II	EX3425	Microprocessor and Microcontroller
Open Elective-III	EX3526	Embedded Systems

5. Information Technology Department

List of Open Elective (Offline Mode)

Open Elective	Course Code	Course Title
Open Elective-I	IT3316	Internet of Things
Open Elective-I lab	IT3311	Internet of Things Lab
Open Elective-II	IT3415	Robotics and Automation
Open Elective-III	IT3516	Augmented Reality and Virtual Reality

List of Open Elective (MOOCs Mode)

Open Elective	Course Code	Course Title
Open Elective-I	IT3326	Sensors and Internet of Things
Open Elective-I lab	IT3321	Sensors and Internet of Things Lab
Open Elective-II	IT3425	Robotics and Automation
Open Elective-III	IT3526	Multimedia and Reality

List of Open Electives (OE) - Institute Level- Industrial orientated

AIDSML

Open Elective	Course Code	Course Title	Sem
Open Elective-I	IOE3311	Foundations of AI, Data Science, and Data Engineering”	III
Open Elective-I lab	IOE3312	Foundations for AI, Data Science, and Data Engineering Lab”	III
Open Elective-II	IOE3413	Advanced AI Integration	IV
Open Elective-III	IOE3514	AI Applications and Emerging Technologies	V

AIOT

Open Elective	Course Code	Course Title	Sem
Open Elective-I	IOE3321	IoT Hardware and Sensors	III
Open Elective-I lab	IOE3322	IoT Hardware and Sensors lab	III
Open Elective-II	IOE3423	Fundamentals of AIoT	IV
Open Elective-III	IOE3524	Cloud Services for IoT	V

ARVR

Open Elective	Course Code	Course Title	Sem
Open Elective-I	IOE3331	AR/VR Application Development	III
Open Elective-I lab	IOE3332	AR/VR Application Development lab	III
Open Elective-II	IOE3433	Fundamentals of Real-time Rendering	IV
Open Elective-III	IOE3534	Game Development with Unreal Engine	V

ERP-SAP

Open Elective	Course Code	Course Title	Sem
Open Elective-I	IOE3341	ABAP Programming for SAP HANA	III
Open Elective-I lab	IOE3342	ABAP programming in Eclipse LAB	III
Open Elective-II	IOE3443	SAP HANA	IV
Open Elective-III	IOE3544	SAP PEOJECT	V

Basket of Vocational Skill Enhancement Courses (VSEC)

List of VSEC Courses offered Semester wise						
Semester I						
Sr.	Course Code	Course	L	T	P	Credits
1	ME3110	Workshop practice I	--	--	2	1
Semester II						
2	ME3210	Workshop practice II	--	--	2	1
Semester IV						
3	ME3311	Workshop practice III	--	--	2	1
Semester V						
4	ME3510	Computer Integrated Manufacturing Lab	--	--	2	1
TOTAL						04