GOVERNMENT COLLEGE OF ENGINEERING KARAD

(*An Autonomous Institute of Government of Maharashtra*)

DEPARTMENT OF MECHANICAL ENGINEERING

SCHEME OF INSTRUCTION FOR

SECOND YEAR

BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING

AS PER NEP-2020

W.E.F

AY 2024-25

Professor and Head of th
Dept. of Mechanical Engineering
Govt. College of Engineering, KARAD

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."

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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.

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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.

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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	60/10 0/50	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)

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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

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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	60/10 0/50	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)

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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

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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

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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**

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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**

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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**

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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**

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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

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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 III						
3	**ME3311**	Workshop practice III	--	--	2	**1**
Semester V						
4	**ME3510**	Computer Integrated Manufacturing Lab	--	--	2	**1**
					TOTAL	**04**

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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

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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

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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

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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

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

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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

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

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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

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

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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

Professor and Head of th
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Govt. College of Engineering, KARAD

Institute Level- Industrial orientated Open Elective

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