

B.Tech. Mechanical Engineering – 2025-26



RBU

RAMDEOBABA UNIVERSITY, NAGPUR
Formerly Shri Ramdeobaba College of Engineering & Management (RCOEM) Est. 1984
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RAMDEOBABA UNIVERSITY, NAGPUR-440013

School of Engineering Sciences

Department of Mechanical Engineering

PROGRAMME SCHEME & SYLLABI

B.Tech. Mechanical Engineering – 2025-26

Total Credit:162

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SEMESTER - I												
SN	Course Type	Course Code	Course Name	Hours/Week			Credits	Maximum Marks			Total	ESE Duration (Hrs.)
				L	P	S		Cont. Evaluation		End Sem Exam		
								TH	PR			
1	BSC	25HS03TP0107	Differential Calculus and Basics of Statistics	3	2	2	4	50	50	50	150	3
2	ESC	25EE07TP0106	Basics of Electrical Engineering	2	2	2	3	50	50	50	150	2
3	ESC	25ES04TH0101	Engineering Mechanics	3	0	1	3	50	-	50	100	3
4	ESC	25ES04TP0102	Engineering Graphics	2	2	2	3	50	50	50	150	2
5	ESC	25ES04TP0103	Programming for Problem Solving	2	2	2	3	50	50	-	100	-
6	AEC/HSSM	25HS02TP0101	English for Professional Communication	2	2	1	3	50	25	50+25	150	2
7	VEC/HSSM	25HS02TH0104	Foundational Course in Universal Human Values	1	0	1	1	50	-	-	50	-
			TOTAL	15	10	9	20	350	225	200	850	12

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Semester II												
S N	Course Type	Course Code	Course Name	Hours/ week			Cr edi ts	Maximum Marks				ESE Duration (Hrs.)
				L	P	S		Cont. Evaluation		End Sem Exam	Total	
								Th	Pr			
1	BSC	25HS03TH0217	Linear Algebra and Integral calculus	3	0	1	3	50	-	50	100	3
2	BSC	25HS05TP0203	Applied Physics	3	2	2	4	50	50	50	150	3
3	ESC	25ES04TH0201	Introduction to Artificial Intelligence	3	0	1	3	50	-	50	100	3
4	ESC	25ES04TH0202	Theory of Mechanisms & Elasticity	3	0	1	3	50	-	50	100	3
5	ESC	25ES04TH0203	Digital Logic Design	2	2	1	3	50	50	50	150	2
6	ESC	25ES04TP0204	Data Structure and OOPS	2	2	2	3	50	50	50	150	2
7	VSEC	25ES04TP0205	Fabrication Practices	1	2	1	2	50	50		100	-
8	CCA	25HS02PR0206 -1 to 17	Liberal/Performing Arts Lab	0	2		1	-	25	25	50	-
9	CCA	25HS04PR0201	Sports-Yoga-Recreation	0	2		1		50		50	
			TOTAL	17	12	8	23	350	275	325	950	16

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Semester III												
SN	Course Type	Course Code	Course Name	Hours/Week			Credits	Maximum Marks			Total	ESE Duration (Hrs.)
				L	P	S		Cont. Evaluation		End Sem Exam		
								TH	PR			
1	BSC	25ES04TH0303	Probability & Statistics	3	0	1	3	50	-	50	100	3
2	PCC	25ES04TH0301	Thermodynamics	3	0	1	3	50	-	50	100	3
3	PCC	25ES04TP0302	Manufacturing Engineering	2	2	2	3	50	50	50	150	2
4	PCC	25ES04TP0303	Materials Science & Testing	2	2	2	3	50	50	50	150	2
5	PCC	25ES04TP0304	Introduction to Python	2	2	2	3	50	50	50	150	-
6	PCC	25ES04TP0305	Machine Drawing and CAD	1	2	2	2	50	50	50	150	-
7	OE	25ESOEC03TH0306	Open Elective-I/ MOOC	2	0	2	2	50	-	50	100	2
8	MDM	25ES04TH0307	MDM-I	3	0	1	3	50	-	50	100	3
9	AEC	25ES04TH0308	Design Thinking	0	2	1	1	-	50	-	50	-
			TOTAL	18	10	12	23	400	250	400	1050	15

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Semester IV												
SN	Course Type	Course Code	Course Name	Hours/Week			Credits	Maximum Marks			Total	ESE Duration (Hrs.)
				L	P	S		Cont. Evaluation		End Sem Exam		
								TH	PR			
1	PCC	25ES04TH0401	Mechanics of Solids	3	0	1	3	50	-	50	100	3
2	PCC	25ES04TP0402	Kinematics and Dynamics of Machinery	3	2	2	4	50	50	50	150	3
3	PCC	25ES04TP0403	Fluid Mechanics and Hydraulic Machines	3	2	2	4	50	50	50	150	3
4	PCC	25ES04TP0404	Manufacturing Technology	3	2	2	4	50	50	50	150	3
5	CEP/FP	25ES04PR0405	Project-1 (Mini project)	0	2	2	1	-	50	-	50	-
6	OE	25ESOEC04TH0406	Open Elective-II/ MOOC	2	0	2	2	50	-	50	100	2
7	MDM	25ES04TH0407	MDM-II	3	0	1	3	50	-	50	100	3
8	AEC	CDPC	Basic Competitive Coding	0	2	2	1	-	50	-	50	-
9	VEC	25HS04TP0401	Environmental Science	1	2		2	50	-	-	50	-
			TOTAL	18	12	14	24	350	250	300	900	17

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Semester V												
Sr. No.	Course Type	Course Code	Course Name	Hours/week			Credits	Maximum marks				ESE Duration (Hrs)
				L	P	S		Continuous Evaluation		End Sem Exam	Total	
1	PCC	25ES04TP0501	Robotics and Mechatronics	2	2	2	3	50	50	50	150	2
2	PCC	25ES04TP0502	Design of Machine Elements	3	2	2	4	50	50	50	150	3
3	PCC	25ES04TP0503	Heat Transfer	3	2	2	4	50	50	50	150	3
4	PCC	25ES04TP0504	Instrumentation and control	3	2	2	4	50	50	50	150	3
5	MDM	25ES04TH0507	MDM-III	3		2	3	50	-	50	100	3
6	PSE	25ESPSE05TH0505	Program Specific Elective-I (List Specified)	3	0	2	3	50		50	100	3
7	OE	25ESOEC05TH0506	Open Elective-III OR MOOC Course	3	0	2	3	50		50	100	3
			Total	17	8	14	24	350	200	350	900	20

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Program Specific Elective – I			
Course Code	Course Name	Course Code	Course Name
25ESPSE04TH0505-1	Mechanical Electrical & Plumbing	25ESPSE04TH0505-5	Data Visualization Tools
25ESPSE04TH0505-2	Automotive Powertrains	25ESPSE04TH0505-6	Digital Twins & Cyber Physical Systems
25ESPSE04TH0505-3	Advanced Materials & Composites	25ESPSE04TH0505-7	Machine Learning for Mechanical Engineering
25ESPSE04TH0505-4	Manufacturing Execution Systems	25ESPSE04TH0505-8	Ancient Indian Machines

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Semester VI												
Sr. No.	Course Type	Course Code	Course Name	Hours/week			Credits			Maximum marks		ESE Duration (Hrs)
				L	P	S		Continuous Evaluation		End Sem Exam	Total	
1	PCC	25ES04TH0601	Robotic Process Automation	3	0	2	3	50		50	100	3
2	PCC	25ES04TP0602	Computer Aided Engineering	3	2	2	4	50	50	50	150	3
3	PCC	25ES04TH0603	Applied Thermal Engineering	3	2	2	4	50		50	100	3
4	PCC	25ES04TH0604	Product Innovation and Entrepreneurship	3	0	2	3	50		50	100	3
5	PSE	25ESPSE04TP0605	Program Specific Elective-II (List specified)	3	0	2	3	50	50	50	150	3
6	MDM	25ES04TH0607	MDM-IV	3	0	0	3	50	-	50	100	3
7	Project	25ES04PR0608	Project-II	0	4	2	2	50		50	100	2
			Total	21	6	8	22	350	100	350	800	20

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Program Specific Elective – II

Course Code	Course Name
25ESPSE04TP0605-1	3-D Printing & Additive Manufacturing
25ESPSE04TP0605-2	Renewable Energy Systems
25ESPSE04TP0605-3	Human Machine Interface
25ESPSE04TP0605-4	Drone & Electric Vehicle Technology

Program Specific Elective – III

Course Code	Course Name
25ESPSE04TP0606	Synthesis of Mechanisms
25ESPSE04TP0606	Automated System Integration
25ESPSE04TP0606	Industrial Internet of Things
25ESPSE04TP0606	Hydraulics & Pneumatics
25ESPSE04TP0606	Relational DBMS
25ESPSE04TP0606	Automotive Mechanics
25ESPSE04TP0606	Human Factors in Engineering

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Semester VII												
Sr. No.	Course Type	Course Code	Course Name	Hours/week			Credits	Maximum marks				ESE Duration (Hrs)
				L	P	S		Continuous Evaluation		End Sem Exam	Total	
1	PCC	25ES04TP0702	Automation in Manufacturing	2	2	2	3	50	50	50	150	3
2	PSE	25ESPSE04TH0703	Program Specific Elective-III (List specified)	3	0	2	3	50		50	100	3
3	PSE	25ESPSE04TP0704	Program Specific Elective-IV (List specified)	3	0	2	3	50	-	50	150	3
4	Project	25ES04PR0706	Project-III	0	8	2	4	100		100	200	3
5	AEC	University Policy	Participative Learning	-	-	15	1	-	-	-	-	-
Total				08	10	23	14	250	50	250	550	12

Program Specific Elective-IV			
Course Code	Course Name	Course Code	Course Name
25ESPSE04TH0703-1	Artificial Intelligence	25ESPSE04TH0703-6	Power Plant Engineering
25ESPSE04TH0703-2	Micro Fluidics	25ESPSE04TH0703-7	Six Sigma Management
25ESPSE04TH0703-3	Micromachining	25ESPSE04TH0703-8	Motion Control Systems
25ESPSE04TH0703	Wealth Creation & Management	25ESPSE04TH0703-9	Elements of Marine Engineering

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25ESPSE04TH0703-4	Armament Technology in Defense	25ESPSE04TH0703-10	Space Technology
25ESPSE04TH0703-5	Introduction to Corporate Law Practice	25ESPSE04TH0703-11	Standards and Certification Processes

Semester VIII											
Sr . No.	Course Type	Course Code	Course Name	Hours/week			Credits	Maximum marks			ESE Duration (Hrs)
				L	P	S		Continuous Evaluation	End Sem Exam	Total	
1	PSE	25ESPSE04TH0801	Occupational Health & Safety OR MOOC courses	3	0	2	3	50	50	100	3
2	PSE	25ESPSE04TH0802	Multi-criteria Decision Making OR MOOC Courses	3	0	2	3	50	50	100	3
3	Project	25ES04PR0803	Project-IV	0	12	2	6	100	100	200	3
			Total	6	12	6	12	200	200	400	9
			OR								
1	ELC	25ESEL04TH0804	Research Methodology OR Research Paper Publication in	4	0	2	4	50	50	100	3

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			WoS/SCOPUS/SCI Journal								
2	ELC	25ESEL04PR0805	Full Semester Research Internship at the Institute	0	16	2	8	150	150	300	-
			Total	4	16	4	12	200	200	400	3
			OR								
1	ELC	25ESEL04PR0806	TBI Internship	0	24	2	12	200	200	400	-
			OR								
1	ELC	25ESEL04PR0807	Full Semester Industry Internship	0	24	2	12	200	200	400	-
					24	4	12			400	

* For Online MOOC Courses only the SWAYAM portal is allowed

Program Specific Elective – to be added later	
Course Code	Course Name
	Augmented Reality & Virtual Reality
	Computational Fluid Dynamics
	Supply Chain Management
	Industrial Robotics
	Operations Research & Optimization
	Unmanned Aerial Systems (UAS)
	Enterprise Resource Planning

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	National Accreditation Board for Testing and Calibration Laboratories
	Non-Destructive Testing
	Product Lifecycle Engineering
	Refrigeration & Air Conditioning
	Stress Analysis
	Field and Service Robots
	Noise Vibration & Harshness
	Work System Design

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Honors scheme											
Sr. No.	Sem	Course Code	Course Title	Hours/week			Credits	Maximum marks			ESE Duration (Hrs)
				L	P	S		Continuo	End Sem Exam	Total	
1	III	25ES04HT0301	Geometric Dimensioning and Tolerances	3	0	2	3	50	50	100	3
2	IV	25ES04HT0401	Advanced Solid Modelling & Assembly	3	0	2	3	50	50	100	3
3	V	25ES04HT0501	Additive Manufacturing Techniques	4	0	2	4	50	50	100	3
4	VI	25ES04HT0601	Design for Manufacturing	4	0	2	4	50	50	100	3
5	VII	25ES04HP0701	Project	0	8	2	4	50	50	100	3
			TOTAL	14	8	10	18				

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MDM- Defense Technology											
Sr. No.	Sem	Course Code	Course Title	Hours/week			Credits	Maximum marks			ESE Duration (Hrs)
				L	P	S		Continuous Evaluation	End Sem Exam	Total	
1	III	25ES03TH0307	Defense Platforms	3	0	2	3	50	50	100	3
2	IV	25ES03TH0407	Warfare system	3	0	2	3	50	50	100	3
3	V	25ES03TH0507	Weapon Systems	3	0	2	3	50	50	100	3
4	VI	25ES03TH0607	Self-defense & Protection system	3	0	2	3	50	50	100	3
			TOTAL	12	0	8	12				

Minors scheme											
Sr. No.	Sem	Course Code	Course Title	Hours/week			Credits	Maximum marks			ESE Duration (Hrs)
				L	P	S		Continuous	End Sem Exam	Total	
1	III	25ES04MT0301	Basics of Mechanical Engineering	3	0	2	3	50	50	100	3
2	IV	25ES04MT0401	Energy system and technologies	3	0	2	3	50	50	100	3
3	V	25ES04MT0501	Product Design & Digital Manufacturing	4	0	2	4	50	50	100	3
4	VI	25ES04MT0601	Automotive Technology	4	0	2	4	50	50	100	3
5	VII	25ES04MP0701	Project	0	8	2	4	50	50	100	3
			TOTAL	14	8	10	18				

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