



K.E. Society's
Rajarambapu Institute of Technology, Rajarnagar
(An Autonomous Institute, affiliated to Shivaji University, Kolhapur)
 Curriculum Structure and Evaluation Scheme
 With effective from 2019-23 [2019-23 Batch]
 Department of Automobile Engineering

Class: S. Y. B. Tech. Mechanical Engineering Automobile

Semester: III

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for passing (%)	Max.	Min. for passing (%)	
SH2032	Engineering Mathematics – III	3	1	-	4	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
MA201	Applied Thermodynamics	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
MA203	Engineering Mechanics	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
MA205	Manufacturing Technology	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
MA207	Material Science & Metallurgy	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
SH2172	Environmental Science	1*	-	-	1	ISE	50	40	---	---	
						ESE	50	40	---	---	
MA209	Workshop Practice – I	-	-	2	1	ISE	---	---	100	50	
MA211	Engineering Mechanics Lab	-	-	2	1	ISE	---	---	100	50	
MA213	Machine Drawing Lab.	-	-	2	1	ISE	---	---	50	50	
						ESE	---	---	50	50	
MA215	Comprehensive Exam-I	-	-	-	1	ESE	---	---	100	50	
SH2612	Environmental Science Project	-	-	2	1	ISE	---	---	100	50	
	Open Elective- II Choice Based Soft Skill Program-I	-	-	2	1	ISE	-	-	100	50	
	TOTAL	16	1	10	23						

ISE = In Semester Evaluation, UT1 = Unit Test 1, UT2 = Unit Test 2, ESE = End Semester Examination

Total Contact Hours/week : 27

Total Credits : 23

Note*: One extra lecture to be allotted to Environment Science in the timetable.

Comprehensive Exam-I: Engineering Mathematics – III, Applied Thermodynamics, Engineering Mechanics





Open Elective- II

Sr. No.	Subject Name	Course Code
1.	Choice Based Soft Skill Program-I & II	Personal Effectiveness & Body Language SH2593
2.		Interpersonal Skills (Work-life Balance) SH2613
3.		Leadership & Public Speaking SH2633
4.		Innovation Tools and Methods for Entrepreneurs SH2693
5.		German Language – Basic Level SH2733
6.		Japanese Language – Basic Level SH2713

Note:

1. A student has to complete any two courses out of six choices offered under the Choice Based Soft Skills Programme. A course in each semester will be allocated without any repetition.
2. The students who have completed 'German Language Lab' or 'Japanese Language Lab' in F.Y. B. Tech should not give their choice for 'German Language – Basic Level' and 'Japanese Language – Basic Level'. Such students may give their choices for 'German Language – Advanced Level' and 'Japanese Language – Advanced Level' (batch sizes 40 each) in the S.Y. B. Tech Sem-IV only.
3. The students who will select and will complete 'German Language – Basic Level' and 'Japanese Language – Basic Level' in S.Y. B. Tech Sem-III will by default (mandatorily) appear for Advance Levels of said courses in Semester-IV.





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Class: S. Y. B. Tech. Mechanical Engineering Automobile

Semester: IV

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for passing (%)	Max	Min. for passing (%)	
MA202	Kinematics of Machines	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
MA204	Fluid Mechanics & Machinery	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
MA206	Electric Drives and Controls	2	-	-	2	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
MA208	Mechanics of Materials	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
MA210	Industrial Organisation and Management	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
MA212	Metrology & Measurement Lab.	-	-	2	1	ISE	---	---	100	50	
MA214	Fluid Mechanics & Machines Lab.	-	-	2	1	ISE	---	---	50	50	
						ESE	---	---	50	50	
MA216	Solid Modeling Lab	-	-	2	1	ISE	---	---	100	50	
MA218	Workshop Practice - II	-	-	2	1	ISE	---	---	100	50	
MA220	Object-Oriented Programming Lab	-	-	2	1	ISE	---	---	50	50	
						ESE	---	---	50	50	
MA222	Comprehensive Exam-II	-	-	-	1	ESE	---	---	100	50	
	Open Elective- III Choice Based Soft Skill Program-II	-	-	2	1	ISE	-	-	50	50	
						ESE	-	-	50	50	
TOTAL		14	-	12	21						

ISE = In Semester Evaluation, UT1 = Unit Test 1, UT2 = Unit Test 2, ESE = End Semester Examination

Total Contact Hours/week : 26
Total Credits : 21

Note: Students are required to undergo industrial / field training of a minimum of four weeks in the vacation of Semester-IV and its evaluation will be carried out in the Semester-V
Comprehensive Exam-III : Kinematics of Machines, Mechanics of Materials, Fluid Mechanics & Fluid Machinery





Open Elective- III

Sr. No.	Subject Name	Course Code
1.	Choice Based Soft Skill Program-I & II	Personal Effectiveness & Body Language SH2593
2.		Interpersonal Skills (Work-life Balance) SH2613
3.		Leadership & Public Speaking SH2633
4.		Innovation Tools and Methods for Entrepreneurs SH2693
5.		German Language – Advanced Level SH2643
6.		Japanese Language – Advanced Level SH2623

Note:

1. A student has to complete any two courses out of six choices offered under the Choice Based Soft Skills Programme. A course in each semester will be allocated without any repetition.
2. The students who have completed 'German Language Lab' or 'Japanese Language Lab' in F.Y. B.Tech should not give their choice for 'German Language – Basic Level' and 'Japanese Language – Basic Level'. Such students may give their choices for 'German Language – Advanced Level' and 'Japanese Language – Advanced Level' (batch sizes 40 each) in the S.Y. B. Tech. Sem-IV only.
3. The students who will select and will complete 'German Language – Basic Level' and 'Japanese Language – Basic Level' in S.Y. B.Tech Sem-III will by default (mandatorily) appear for Advance Levels of said courses in Semester-IV.





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Class: T. Y. B. Tech. Mechanical Engineering Automobile

Semester: V

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for Passing (%)	Max	Min. for passing (%)	
MA301	Internal Combustion Engines	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			40	---
MA303	Dynamics of Machines	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			40	---
MA305	Heat Transfer	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			40	---
MA307	Automotive Systems	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			40	---
MA309	Autotronics	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			40	---
	Program Elective-I	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			40	---
MA323	I. C. Engine Lab.	-	-	2	1	ISE	---	---	---	50	50
MA325	Thermal Engineering Lab.	-	-	2	1	ESE	---	---	---	50	50
						ISE	---	---	---	50	50
MA327	Automobile Engineering Lab.	-	-	2	1	ESE	---	---	---	50	50
						ISE	---	---	---	50	50
MA329	Theory of Machines Lab	-	-	2	1	ISE	---	---	---	100	50
MA331	Comprehensive Exam-III	-	-	-	1	ESE	----	----	----	100	50
SH3032	Aptitude Training I	2*	-	-	2	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			40	---
MA333	Summer Internship (4 Weeks)	-	-	-	2	ISE	---	---	---	100	50
SH301	Indian Constitution	2	-	-	Audit	ISE	100	50	(P/N)		
TOTAL		22	-	8	27						

ISE = In Semester Evaluation, UT1 = Unit Test 1, UT2 = Unit Test 2, ESE = End Semester Examination

Total Contact Hours/week : 30
Total Credits : 27

Note*: One extra lecture to be allotted to Scholastic Aptitude-I in time Table.
Comprehensive Exam-III: Internal Combustion Engines, Heat Transfer, Dynamics of Machines





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Department of Automobile Engineering

Program Elective – I:

Sr. No.	Course Code	Discipline	Course
1	MA311	Design	Product Design and Development
2	MA313		Tribology
3	MA315	Power & Manufacturing	Fuels and combustion
4	MA317		Welding and Joining Technologies
5	MA319	Management & Service	Transport management
6	MA321		Industrial Engineering





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Class: T. Y. B. Tech. Mechanical Engineering Automobile

Semester: VI

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for passing (%)	Max	Min. for passing (%)	
MA302	Design of Machine Elements	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
MA304	Electric and Hybrid Electric Vehicles	2	-	-	2	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
MA306	Automotive Safety and Ergonomics	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
	Program Elective-II	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
	Open Elective-IV	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
SH302	Biology for Engineers	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
MA320	Automotive Diagnostic Lab.	-	-	2	1	ISE	---	---	50	50	
						ESE	---	---	50	50	
MA322	Advance Modeling Lab	-	-	2	1	ISE	---	---	50	50	
						ESE	---	---	50	50	
MA324	Comprehensive exam-IV	-	-	-	1	ESE	---	---	100	50	
MA326	Capstone Project phase-I	-	-	2	2	ISE	---	---	100	50	
SH3052	Aptitude training- II	2*	-	-	2	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
TOTAL		19	-	6	24						

ISE = In Semester Evaluation, UT1 = Unit Test 1, UT2 = Unit Test 2, ESE = End Semester Examination

Total Contact Hours/week : 25
Total Credits : 24

Note*: One extra lecture to be allotted to Scholastic Aptitude-II and Psychology for Engineers in time Table.

Comprehensive exam Courses: Design of Machine Elements, Electric and Hybrid Electric Vehicles, Automotive Safety and Ergonomics





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Program Elective – II:

Sr. No.	Course Code	Discipline	Course
1	MA308	Design	Automotive Emission and Control Technologies
2	MA310		Sensor and Actuators
3	MA312	Power & Manufacturing	Advanced Manufacturing Processes
4	MA314		Advanced Materials
5	MA316	Management & Service	Total Quality Management
6	MA318		Supply Chain Management

Open Elective-IV

Sr. No.	Branch	Course Code	Open Elective-IV Courses
1	Automobile	OE3023	Reliability Engineering
2	Automobile	OE3043	Renewable Energy Sources
3	Civil	OE3063	Environmental Impact Assessment
4	Civil	OE3083	Material Management.
5	Computer	OE3103	Network Administration
6	Computer	OE3123	Information Technology Foundation Program
7	E&TC	OE3143	Mechatronics
8	Electrical	OE3163	Engineering Materials
9	Electrical	OE3181	Industrial Drives
10	CS&IT	OE3201	Machine Learning for Engineering and Science Applications
11	CS&IT	OE3221	Cyber Forensics
12	MBA	OE3243	Marketing for Engineers
14	Mechanical	OE3263	Aircraft Systems
15	Mechanical	OE3283	Supply Chain Management
16	Mechanical	OE3303	New Product Design and Development
17	Mechanical	OE3323	Entrepreneurship Development
18	Mechanical	OE3341	Research Methodology





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Class: Final Year B. Tech. Mechanical Engineering Automobile **Semester:** VII

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max.	Min. for passing (%)	Max.	Min. for passing (%)	
MA401	Automotive System Design	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
MA403	Vehicle Dynamics	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
	Program Elective-III	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
	Program Elective-IV	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
	Program Elective-V	3	-	-	3	ISE	20	40	40	---	---
						UT1	15			---	---
						UT2	15			---	---
						ESE	50			---	---
MA441	Vehicle Performance Evaluation & Emission Testing Laboratory	-	-	2	1	ISE	---	---	50	50	
						ESE	---	---	50	50	
MA443	CAE Software Proficiency	-	-	2	1	ISE	---	---	50	50	
						ESE	---	---	50	50	
	Program Elective-IV Lab	-	-	2	1	ISE	---	---	50	50	
						ESE	---	---	50	50	
MA457	Capstone Project Phase-II	-	-	4	4	ISE	---	---	100	50	
						ESE	---	---	100	50	
TOTAL		15	0	10	22						

ISE = In Semester Evaluation, UT1 = Unit Test 1, UT2 = Unit Test 2, ESE = End Semester Examination

Total Contact Hours/week : 25
Total Credits : 22





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Program Elective – III:

Sr. No.	Course Code	Discipline	Course
1	MA405	Design	Finite Element Analysis
2	MA407		Design of Composite Materials
3	MA409	Power & Manufacturing	Tool Engineering
4	MA411		Rapid Prototyping
5	MA413	Management & Service	Quantitative Techniques
6	MA415		Engineering Economics

Program Elective – IV:

Sr. No.	Course Code	Discipline	Course
1	MA417	Design	Hydraulic & Pneumatics
2	MA419		Engine Design
3	MA421	Power & Manufacturing	Refrigeration & Air Conditioning
4	MA423		Robotics and Automation
5	MA425	Management & Service	Automotive Business Management
6	MA427		Motor Vehicle Insurance Practices

Program Elective – V:

Sr. No.	Course Code	Discipline	Course
1	MA429	Design	Product Life Cycle Management
2	MA431		Computational Fluid Dynamics
3	MA433	Power & Manufacturing	Automotive Aerodynamics
4	MA435		Fuel Cell Technology
5	MA437	Management & Service	Production & Operation Management
6	MA439		Project Management

Program Elective – IV Lab.:

Sr. No.	Course Code	Discipline	Course
1	MA445	Design	Hydraulic & Pneumatics Lab
2	MA447		Engine Design Lab
3	MA449	Power & Manufacturing	Refrigeration & Air Conditioning Lab
4	MA451		Robotics and Automation Lab
5	MA453	Management & Service	Automotive Business Management Lab
6	MA455		Motor Vehicle Insurance Practices Lab





Track I: Industry Internship & Projects (IIP)

Class: Final Year B. Tech

Semester: VIII

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max.	Min. for passing (%)	Max.	Min. for passing (%)	
OE4381	Finance for Engineers (Online Course)	2	-	-	2	ISE	25	40	40	---	---
						ESE	75	40		---	---
OE4361	Engineering Management & Economics (Online Course)	2	-	-	2	ISE	25	40	40	---	---
						ESE	75	40		---	---
IP4023	Internship & Project	-	-	-	8	ISE	---	---		50	50
						ESE	---	---		50	50
TOTAL		4	-	-	12						

ISE = In Semester Evaluation, ESE = End Semester Exam

Total Contact Hours/week : 04
Total Credits : 12

Note:

1] Weekly Contact hours are not mentioned for the IP4023 course, because a student is expected to be in the industry regularly for 20 weeks. However, a student needs to report to Institute mentors as and when required.

2] For online courses, lecture videos of each unit will be made available through the college platform to the students. For each unit, there will be a separate assignment. Students need to submit all assignments within the specified time.

Weightage: 25% weightage for unit wise assignments + 75% weightage for final exam. The final exam will be held at the college campus.





Track II: Undergraduate Research Experience (URE)

Class: Final Year B. Tech

Semester: VIII

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max.	Min. for passing (%)	Max.	Min. for passing (%)	
OE4381	Finance for Engineers (Online Course)	-	-	-	2	ISE	25	40	40	---	---
						ESE	75	40		---	---
OE4361	Engineering Management & Economics (Online Course)	-	-	-	2	ISE	25	40	40	---	---
						ESE	75	40		---	---
RE4043	Research Project	-	-	8	8	ISE	---	----	50	50	
						ESE	---	---		50	50
TOTAL		-	-	8	12						

ISE = In Semester Evaluation, ESE = End Semester Exam

Total Contact Hours/week : 08

Total Credits : 12

Note:

For online courses, lecture videos of each unit will be made available through the college platform to the students. For each unit, there will be a separate assignment. Students need to submit all assignments within the specified time.

Weightage: 25% weightage for unit wise assignments + 75% weightage for final exam. The final exam will be held at the college campus.





Track III: Entrepreneurship Development (ED)

Class: Final Year B. Tech

Semester: VIII

Course Code	Course	Teaching Scheme			Credits	Evaluation Scheme					
		L	T	P		Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for passing (%)	Max	Min. for passing (%)	
ED4103	Project Management	2*	-	-	2	ISE	20	40	40	---	---
						UT-1	15				
						UT-2	15				
						ESE	50				
ED4043	Commercial Aspects of the Project	2*	-	-	2	ISE	20	40	40	---	---
						UT-1	15				
						UT-2	15				
						ESE	50				
ED4063	Entrepreneurship Development Program (EDP)	-	-	-	1	ISE	---	---	---	100	50
ED4083	Entrepreneurship Development Project	-	-	7	7	ISE	---	---	---	50	50
						ESE	---	---	---	50	50
Total		4	-	7	12						

ISE = In Semester Evaluation, ESE = End Semester Examination

Total Contact Hours/week : 11
Total Credits : 12

Note:

* One extra lecture to be allotted to Project Management and Commercial Aspects of the Project course in the timetable.

