



## FACULTY OF ENGINEERING & TECHNOLOGY

Effective from Academic Batch: 2022-23

**Programme:** Bachelor of Technology (Automobile Engineering)

**Semester:** VII

**Course Code:** 202010703

**Course Title:** Vehicle Maintenance and Garage Practice

**Course Group:** Professional Core Course

**Course Objectives:** Students will be able to understand maintenance and repair methods/techniques with applications of application of various hand tools, special purpose tools, power tools and service equipment. Students will also be able to manage and run workshop or service station by learning about different documents used and records required in modern service station.

### Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
Lecture	Tutorial	Practical		Internal		External		Total
				Theory	J/V/P*	Theory	J/V/P*	
3	0	2	4	50 / 18	25 / 9	50 / 17	25 / 9	150 / 53

\* J: Jury; V: Viva; P: Practical

### Detailed Syllabus:

Sr.	Contents	Hours
1	<b>Introduction:</b> Requirements & importance of service and maintenance, type of maintenance: preventive, predictive & breakdown maintenance, types of maintenance schedules (daily, weekly and monthly) in respect of the scheduled maintenance chart shown in service book of a vehicle, periodic maintenance scheduled chart.	04
2	<b>Tools, Equipment and Measuring Instruments:</b> Study & application of hand tools, power tools, special purpose tools, measuring & gauging instruments for wear, fuel consumption, speed, acceleration, vibration, noise, study of service/repair equipment with operating process, methods used for measurement of fuel consumption.	05



<b>3</b>	<b>Workshop Management Practices:</b> Types, functions, operations & activities of service stations, layouts of modern service station/workshop, study of workshop documents & records like Inspection schedule, job cards, parts catalogue, parts price list, vehicle history sheet, warranty card, bill & billing procedure of vehicle, logbook of vehicle, customer satisfaction sheet, service book, etc. activities & responsibilities of workshop management, workflow in service station, customer complaint handling & consumer cases in case of any dispute.	<b>06</b>
<b>4</b>	<b>Maintenance &amp; Overhauling of Engine Components:</b> Engine disassembly, measurement of cylinder bore, cylinder boring & honing, liners fitting, cylinder head facing, valve seat lapping, adjustment of valve timing, piston & crankshaft assembly, engine assembling process, fuel injection pump timing, rocker arm gap adjustment/setting procedure, tuning of carburetor, fuel injection pumps, fuel injector's calibration, engine lubrication circuit & its components, fuel supply circuit of petrol, diesel, bi-fuel engines, cooling system layout & its components, air intake & exhaust systems and components.	<b>07</b>
<b>5</b>	<b>Maintenance &amp; Overhauling of Driveline System:</b> Adjustment of clutch, repair & replacement of clutch parts, overhauling of all types of gear boxes, repair & maintenance of propeller shaft, universal joint, constant velocity joint, differential and final drive/axles, differential back lash adjustment.	<b>06</b>
<b>6</b>	<b>Maintenance &amp; Overhauling of Braking and Steering System:</b> Maintenance of hydraulic brakes; brake adjustments and bleeding of brakes. Maintenance of air brake, study & adjustment of steering geometry: toe in, toe out, caster, camber, and king pin inclination, maintenance of steering system, diagnosis, causes and remedies of steering system.	<b>05</b>
<b>7</b>	<b>Maintenance &amp; Overhauling of Suspension and Wheels &amp; Tyre:</b> Lubrication & maintenance of suspension system., maintenance of wheel and tyre, tyre rotation, tyre re-treading, effect of tyre inflation & tyre wear, wheel balancing & wheel alignment, diagnosis, causes and remedies suspension and wheel related problems.	<b>05</b>
<b>8</b>	<b>Maintenance &amp; Overhauling of Auto Electrical, Air Conditioning and Vehicle Body:</b> Maintenance of batteries, starting system, charging system & electrical - fault diagnosis using scan tools, maintenance of air conditioning parts like compressor, condenser, expansion valve, evaporator, replacement of hoses, leak detection, AC charging, fault diagnosis vehicle body repair like panel beating, tinkering, soldering, polishing & painting.	<b>07</b>



**List of Practicals / Tutorials:** Click or tap here to enter text.

1	Study of modern workshop layout, documents and records.
2	Demonstration of measuring, gauging & service equipments.
3	Performance on wheel balancer.
4	Performance on wheel aligner.
5	Cleaning and testing of petrol injector.
6	Cleaning and testing of different types of nozzles.
7	Overhauling of engine components.
8	Overhauling of driveline system of a vehicle.
9	Overhauling of any system of a vehicle.
10	Demonstration of air conditioning recovery unit.

**Reference Books:**

1	Automotive Mechanics by William H. Crouse & Donald L. Anglin; Tata McGraw Hill Publication
2	Automobile systems by Anil Chikara, Satya Prakashan Publication
3	Automobile Engineering by K.K.Ramlingan, SciTech Publication
4	Auto mechanics by Joseph Heitner, East West Press
5	Automotive Service Basics by Pattern and Donald, Pearson Publications
6	Modern Workshop Documents: Service book, Workshop Manual, Parts catalogue & Job cards

**Supplementary learning Material:**

1	NPTEL Resources
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**Pedagogy:**

- Direct classroom teaching
- Audio Visual presentations/demonstrations



- Assignments/Quiz
- Continuous assessment
- Industrial/Field visit

#### Internal Evaluation :

The internal evaluation comprised of written exam (40% weightage) along with combination of various components such as Certification courses, Assignments, Mini Project, Simulation, Model making, Case study, Group activity, Seminar, Poster Presentation, Unit test, Quiz, Class Participation, Attendance, Achievements etc. where individual component weightage should not exceed 20%.

#### Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks						R: Remembering; U: Understanding; A: Application, N: Analyze; E: Evaluate; C: Create
R	U	A	N	E	C	
25	25	25	10	10	5	

#### Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Understand the importance & types of maintenance, application of tools and service equipments.	20
CO-2	Understand modern workshop management practices.	15
CO-3	Understand maintenance & overhauling of engine components and driveline system.	30
CO-4	Understand maintenance & overhauling of braking, steering, suspension system and wheels & tyre.	20
CO-5	Understand maintenance & overhauling of auto electrical, air conditioning and vehicle body.	15

#### Curriculum Revision:

Version:	2
Drafted on (Month-Year):	June-2022
Last Reviewed on (Month-Year):	
Next Review on (Month-Year):	June-2027