



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering

Subject Code: 3160210

Semester – VI

Subject Name: Vehicle Maintenance and Garage Practice

Type of course:

Prerequisite: Nil

Rationale: Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs
1	Maintenance Basics: Need for maintenance, types of maintenance: preventive and breakdown maintenance, requirements of maintenance, safety precautions in maintenance: General safety, tool safety.	02
2	Tools, Equipment and Instruments: Study and application of hand tools, power tools, Special purpose tools, measuring and gauging instruments. Study of Service/Repair equipment with operating process.	05
3	Workshop management practices: Types, functions, operations and 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 and responsibilities of workshop management. Study of workflow in service station. Customer complaint Handling & consumer cases in case of any dispute.	06
4	Maintenance & Overhauling of engine: Engine disassembly, dismantling of engine components: cylinder head, valve train, cylinder block, connecting rod, piston and crankshaft assembly; cleaning and inspection of engine components, reconditioning of components. Engine assembling process. Diagnosis, causes and remedies of Engine related problems. Fuel, Lubrication and Cooling Systems: Servicing and maintenance of fuel system, Engine tune-up, cooling system: water pump, radiator, thermostat. Lubrication system maintenance, Anticorrosion and anti-freeze additives	08
5	Maintenance & Overhauling of Transmission Systems: Servicing and maintenance of clutch, gear box, universal joints, propeller shaft, differential and final drive. Diagnosis, causes and remedies of transmission related problems. Maintenance & Overhauling of Braking System: Maintenance of hydraulic brakes; brake adjustments and bleeding of brakes. Maintenance of air brake.	06



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6	Maintenance & Overhauling of Steering, Suspension and Wheels and tyre: Maintenance of steering system. Lubrication and maintenance of suspension system. Maintenance of wheel and tyre. Tyre rotation, Wheel balancing and Wheel Alignment, Diagnosis, causes and remedies of steering system, wheels and suspension related problems.	06
7	Maintenance of Electrical Systems: Servicing and maintenance of battery, starter motor, alternator, ignition system, lighting system, electric horn, and wiper motor	06
8	Maintenance & repair of vehicle body: Maintenance of vehicle body; minor and major repairs. Body repair tools & equipment. Introduction to denting & painting process of vehicles.	06
	Total	45

Suggested Specification table with Marks (Theory): (For BE only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	20	30	20	10	10

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1. Automotive Mechanics by William H. Crouse & Donald L. Anglin; Tata McGrawHill Publishing Company Ltd.
2. Automobile systems by Anil Chikara, Satya Prakashan.
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. Vehicle Service book
7. Vehicle Workshop Manual.
8. Parts Price List
9. Parts catalogue of service station.
10. Job cards of modern service station.



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Course Outcomes: Students will be able to maintain and repair vehicle with application of various hand tools, special purpose tools, power tools and service equipment. Student will able to manage and run automobile workshop or service station.

Sr. No.	CO statement	Marks % weightage
CO-1	Understand the importance of vehicle inspection, Maintenance and application of tools.	10
CO-2	Diagnose the causes of Engine problem and provide the remedial action	25
CO-3	Identify the causes and service and maintain the clutch, gear box, universal joints, propeller shaft, differential and braking system.	20
CO-4	Possess the knowledge about the inspection and maintenance of suspension, steering system and wheels and tyre.	25
CO-5	Apply the basic knowledge and rectify the electrical systems problems and maintain vehicle body	20

Term Work:

The term work shall be based on the topics mentioned above.

List of Experiments:

1. Study of modern workshop layout
2. Study of different types of job cards & maintenance schedule chart
3. Study of measuring, gauging & service equipment
4. Performance on wheel balancer
5. Performance on wheel aligner
6. Cleaning and testing of petrol injector
7. Cleaning and testing of different types of nozzles
8. Bleeding of hydraulic brakes
9. Overhauling of any component or system of a vehicle
10. Study of different workshop documents & records

Major Equipment:

1. Hydraulic hoist
2. Electronic tyre inflator
3. Tyre changer
4. Wheel aligner
5. Wheel balancer
6. Petrol injector cleaner test setup
7. Diesel nozzle tester and cleaner setup
8. Measuring and gauging instruments



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List of Open Source Software/learning website:

1. <http://auto.howstuffworks.com/>
2. <https://www.carbibles.com/>
3. <https://www.youtube.com/>