

Certificate course in Motar Mechanic

Objective (Student sourly be able to acquire skills & mechanic)

After completers the course, student must be able to repair & do maintenance work of a four wheeler vehicle.

Job opportunities

1. Student can set up his own garage
2. General four wheeler mechanic
3. Dealers service mechanic
4. Garage assistant

Course Duration - One year

Intake Capacity - 25

Infrastructure - Well equipped classroom & auto. Engg. Laboratory with all garage facilities.

Theory –

- 1) **Introduction** - Automobile, history of automobiles, classification of automobiles, different components of automobiles, basic Structure, chassis frames, body styles.
- 2) **Engine** -
 - a) Construction & working of 2 stroke & 4 stroke S.I. engine, single & malty cylinder engines, different components like piston, cylinder crankshaft connecting rod, combustion chambers, valves, cylinder head, cylinder block principle & working of carburetors, types, trouble shooting.
 - b) Construction & working of 2 stroke & 4 stroke C.I engineers, different components of C.I. engine, Fuel injection system, injector, pump, air filters & other parts, cooling system, water pump, radiator, antifreeze solution, Engine lubrication system, types, lubricating oils, exhaust system silencers, Engine trouble shooting.
- 3) **Transmission system – necessity & Functions.**
 - a) Clutches – Necessity & working of clutch, requirements of clutch, types – single plate, multi plate, diaphragm & cone clutch components like clutch plate, pressure plate, springs, throw out bearing, release lever, clutch trouble shooting.

b) Gear Box - Purpose & types of Gear boxes, constant mesh, synchromesh, epic click gear box, overdrive, parts of gear box, types of gears, gear shifting mechanism, torque converter, lubrication of gear box, trouble shooting of gear box.

c) The Drive Line- Propeller shaft, universal joint, slip joint, propeller shaft, Overhauling & trouble shooting Differential, its purpose, 2 & 4 wheel drive, differential lock, bearings, Rear axle, purpose & its types, Trouble shooting of Drive line.

4) **Control unit-**

a) Front axle & steering – Live and dead axle, front wheel assembly, types of stub axle mounting, ball joints.

Steering linkages, steering gears, Steering geometry, camber castor toe-in, toe-out, king pin inclination, alignment & steering adjustment, checking wheel alignment & steering geometry, under steer, over steer, power steering. Computerized wheel alignment steering trouble shooting.

5) **Suspension system-**

Functions of suspension system, types, independent suspension system, leaf spring, shock absorbers, coil springs, torsion bars, air suspension, trouble shooting.

6) **Electrical system –**

Electricity in automobiles, electrical system, starting system, lighting system, charging system, ignition systems, DC generator, & charging, types of ignition system, wiring circuit, lighting system, headlights, indicators.

7) **Wheels & tyres –**

Types of wheels, types of tires & tubes, factors affecting Tyre life, tyre designation, trouble shooting

8) **Body of Vehicle –**

Requirements of automobiles body, constructional details, doors, locks body repair, denting & painting.

9) **Miscellaneous –**

a) Auto shop equipments – Tool kit of mechanic, service station tools, raw materials & consumables used in garage, equipments Like wheel balancing m/c battery testing & charging equipment, lubricating equipment

b) Study of alternate fuels, Air conditioning system.

c) Accessories – Speedometer, wind screen, wiper, horn, air conditioning, power windows & other accessories.

Practical-

- 1) Familiarization with hand tools, machinery & types of work done in the garage. Safety precautions to be observed. Tool kit of mechanic, service station tools, raw materials used and consumables used in garage.
- 2) Overhaul of petrol & diesel engines. Identification of different components. Dismantling, cleaning & refitting the engine components. Running the engine & checking temp, fuel, oil pressure & speed, Engine tune up, cleaning spark plug, minor adjustment of carburetor, setting, valve timing, tappet clearance.
- 3) Servicing of radiator, water pump, oil pump, filter, fuel injection pump. Fault finding & rectification in lubrication system.
- 4) Overhaul of clutch assembly, Remove, inspect, repair, adjust & refit the clutch assembly.
- 5) Overhaul of Gear box of vehicle Remove, inspect adjust & refit the gear box. Inspect & adjust their shifting mechanism & transfer case.
- 6) Overhaul of differential propeller shaft & Rear axle assembly, Dismantle, lubricate & refit the assembly.
- 7) Overhaul of hydraulic and air brake system. Bleeding of brakes. Adjust brake pedal play.
- 8) Inspect & adjust steering linkages steering geometry wheel alignment check & correct toe-in toe-out using gauges, Study of power steering system.
- 9) Repair & maintenance of tyres tubes, wheel assembly Adjusting wheel balance & wheel alignment
- 10) Faultfinding & rectifying the suspension system Dismantling, inspecting shock absorber, replacing with new springs, oil seals & oil.
- 11) Cleaning & testing of Ignition system, Fault finding & rectifying the ignition system. Removing & setting contact breaker pts, ignition timing & CB point gap.
- 12) "Removing battery checking, checking electrolyte, specific gravity & reconnecting Fault finding & rectification of starting system, lighting air unit, head light & other indicators.
- 13) Repair & maintenance of body of vehicle, denting and painting, door lock adjustment.
- 14) Servicing of a 4 wheeler cleaning, inspection, adjustment lubrication & regular maintenance of 4 wheeler.

- 15) Visit to auto Body bldg & mfg. industry, prepare report regarding lay out, body construction, body material Repair, denting, painting procedure.
- 16) Visit to a service station study about service station Set up, 4 wheeler maintenance, tools, raw material consumables, equipments, mechanism & other servicing procedures.
- 17) Vehicle specification collect information regarding vehicle manufactures, products, their specify cautions etc.

Shop equipments/Machinery

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| 1) Screw drives | 2) Spanners |
| 3) Pliers | 4) Hammers |
| 5) Chisels | 6) Files |
| 7) Hacksaws | 8) Cleaning tools |
| 9) Tools for tubes | 10) Drilling m/c & twist drills |
| 11) Soldering tools | 12) Grinder |
| 13) Bench vice | 14) Measuring tools |
| 15) Chain pulley block | 16) Lifting jack & axle stand |
| 16) Creeper | 18) Lifting equipment |
| 19) Battery testing & charging equipment | 20) Hyd.Lift or ramp |
| 20) Tools for tyres | 22) Fuel injector tester |
| 23) Piston ring compress | 24) Piston groove cleaner |
| 25) Air compressor & pressure gauge | |