

COURSE TITLE : AUTOMOBILE SERVICING & MAINTENANCE
COURSE CODE : 6052
COURSE CATEGORY : A
PERIODS/WEEK : 6
PERIODS/SEMESTER: 75
CREDITS : 6

TIME SCHEDULE

Module	Topic	Periods
1	Engine overhauling	18
2	Servicing of ignition system and fuel system of petrol & Diesel engines	20
3	Servicing of clutch, Gear box, Propeller shafts and Wheels	17
4	Servicing of suspension system, steering and brake systems Maintenance of automobiles and its schedules	20
TOTAL		75

GENERAL COURSE OUTCOME

After the completion of the course

Sl. No.	Sub	Students Will be able to
	1	Understand the procedures of overhauling of engines
	2	Describe servicing of ignition system and fuel system of petrol engines
	3	Understand the procedures of servicing fuel system components of diesel engine
	4	Explain the procedure for Servicing of clutch & Gear box
	5	Understand the procedures of rectifying defects in propeller shaft differential and rear axles
	6	Understand the Maintenance of tyres and tubes
	7	Understand the Servicing of suspension, steering and brake systems
	8	Describe the adjustment of free play and end play in various steering gear boxes like worm and roller, re-circulating ball, and rack and pinion types
	9	Explain the procedure for brake shoe removal and re-lining
	10	Understand the procedure for the maintenance of automobiles

SPECIFIC COURSE OUTCOME

MODULE I

1.1.0 Understand the procedures of overhauling of engines

- 1.1.1 Distinguish between servicing and maintenance
- 1.1.2 Indicate the signs showing the necessity of engine overhauling
- 1.1.3 Recognize decarbonizing methods like oxygen decarbonizing, chemical decarbonizing, scraping methods etc
- 1.1.4 Conduct compression test, vacuum test and cylinder leakage test
- 1.1.5 Explain the procedure for engine dismantling and assembling
- 1.1.6 Check piston, cylinder, connecting rod, crank shaft, flywheel, valves and valve operating mechanism
- 1.1.7 Describe the servicing of different engine components

MODULE II

2.1.0 Understand the procedures of servicing ignition system and fuel system of petrol engines

- 2.1.1 Describe the need for servicing and testing of components of coil ignition system
- 2.1.2 Identify the correct ignition timing
- 2.1.3 Explain the defects in the fuel system components and suggest the servicing

2.2.0 Understand the procedures of servicing fuel system components of diesel engine

- 2.2.1 Outline the procedures of servicing F.I. system of Diesel engine
- 2.2.2 Explain the procedures for bleeding and testing of F.I. pump, and testing of Nozzles

MODULE III

3.1.0 Understand the procedure for Servicing of clutch

- 3.1.1 Perform the servicing and adjustment of clutch
- 3.1.2 Write the procedure for dismantling and assembling of Clutch
- 3.1.3 Explain the defects of clutch

3.2.0 Understand the procedure for dismantling and assembling of gear box

- 3.2.1 Describe the procedure for dismantling and assembling of gear box
- 3.2.2 State the defects of gear box

3.3.0 Understand the procedures of rectifying defects in propeller shaft

- 3.3.1 Write the procedure for dismantling and assembling Propeller Shaft
- 3.3.2 Explain the defects of Propeller Shaft

3.4.0 Understand the procedure for servicing of differential and rear axle

- 3.4.1 Suggest the procedure for removal of axle in full floating, three quarter floating and semi floating types
- 3.4.2 Discuss the troubles and adjustment of differential

3.5.0 Understand the Maintenance of tyres and tubes

- 3.5.1 Explain the tyre replacing method
- 3.5.2 Draw the tyre rotation
- 3.5.3 Perform tube repair
- 3.5.4 Discuss the causes of rapid tyre wear
- 3.5.5 Describe the methods of tyre retreading
- 3.5.6 Perform the balancing of tyres

MODULE IV

4.1.0 Understand the Servicing of suspension, steering and brake systems

- 4.1.1 Explain the adjustment of front height of cars by setting torsion bars
- 4.1.2 Describe the points for replacing suspension rubber bushes
- 4.1.3 Explain the adjustment of front wheel alignment
- 4.1.4 Explain the care and maintenance of vibration dampers

4.2.0 Understand the adjustment of free play and end play in various steering gear boxes like worm and roller, re-circulating ball, and rack and pinion types

- 4.2.1 Describe the procedure for centralizing steering wheel
- 4.2.2 Explain the troubles in steering system

4.3.0 Understand the procedure for brake shoe removal and re-lining

- 4.3.1 Explain the brake adjustment and brake bleeding
- 4.3.2 Describe the procedure for servicing wheel cylinder and master cylinder
- 4.3.3 Explain the checking of braking efficiency
- 4.3.4 Discuss the troubles in hydraulic and air brake systems

4.4.0 Understand the procedure for the maintenance of automobiles

- 4.4.1 Explain the types of maintenance – preventive and breakdown
- 4.4.2 Prepare maintenance schedule of automobiles
- 4.4.3 Outline the cleaning of vehicles in a service station
- 4.4.4 Explain the equipments used in a service station

CONTENT DETAILS

MODULE I

Introduction to servicing and maintenance of Automobiles - various signs showing the necessity of overhauling engine decarbonizing, vacuum test, compression test and cylinder leakage test. Causes of excessive lubricating oil consumption. Engine dismantling and assembling. Checking of engine

components – causes of cylinder wear- cylinder reboring and honing – linear replacement. Servicing of valves. Valve adjustment and defects of valves. Piston defects and reconditioning methods. Testing of connecting rods. Defects and reconditioning methods. Measurement of bearing clearance and adjustment of connecting rod bearings. Crank shaft balancing and machining processes. Renewal of flywheel ring gear.

MODULE II

Servicing of petrol engine – defects in coil ignition system like ‘No spark’, weak spark, intermitted spark and spark at some wires. Testing of ignition system components. Setting of ignition timing. Checking of advancing units. Servicing of spark plug. Trouble shooting of fuel system. Testing of A.C. mechanical pump. Tuning of carburettor. Causes of excessive fuel consumption and defects of carburettor. Engine tuning procedure. Servicing of diesel engine – F.I. pump timing and bleeding of diesel fuel system. Testing of Nozzles. Phasing and calibration of F.I. pump. Defects of F.I. pump and Nozzles. Troubles and diagnosis in MPFI and CRDi systems.

MODULE III

Servicing of clutch assembly. Fitting of clutch, clutch adjustments. Removal and refitting of trans-axle. Dismantling of propeller shaft and universal joint. Defects in propeller shaft. Servicing of differential and rear axle. Removal of axles in full floating, semi floating and three quarter floating types. Differential troubles and adjustments. Tube repair. Causes of tyre wear. Tyre rotation, retreading and balancing of wheels.

MODULE IV

Servicing of suspension system. Checking of wheel alignment. Adjustment of torsion bars. Care and maintenance of vibration dampers. Replacement of suspension rubber bushes. Play adjustment in steering gear boxes. Centralizing steering wheel. Troubles in steering system. Brake shoe removal and re-lining. Brake bleeding and adjustment. Servicing of master cylinder and wheel cylinder checking of braking efficiency. Troubles in hydraulic and air brake systems.

Periodic and break down maintenances. Maintenance schedule. Cleaning of vehicle in a service station. Equipment used in a service station.

TEXT BOOKS

1. C.P. Nakra - Practical Automobile Engineering - Dhanpat Rai
2. Anglin And Crouse - Automotive Mechanics- McGraw-Hill

REFERENCES

1. N. Sreenivasan - Practical Automobile Engineering
2. Staton Abbey - Practical Automobile Engineering – Odhams Press
3. N.K. Giri - Automobile Engineering – Khanna publications
4. Anil Chhikara - Automobile Engineering vol. I, II & III - Satyaprakasan
5. James D Halderman - Automotive engines-theory and service – Prentice Hall
6. Donald W Patten & John Remling - Automotive service basics - Prentice Hall
7. Maintenance& repair of Motor vehicles - ILO Manual