

**1151AU217****VEHICLE EVALUATION AND MAINTENANCE****L T P C**  
**3 0 2 4****1. Preamble**

This course makes the students to have a complete knowledge of the vehicle maintenance procedures and acquire skills in handling situations where the vehicle is likely to breakdown.

**2. Pre-requisite**

1151AU107	I.C Engines
1151AU214	Automotive Chassis

**3. Links to other courses**

- Reconditioning and Maintenance Lab
- Transport Management

**4. Course Educational Objectives**

Students undergoing this course are expected to

- To develop the basic knowledge of the students in the various maintenance schedules and work shop records.
- To develop the skills of the students in the Maintenance of vehicles.
- To serve as a pre-requisite course for other courses in UG and PG programmes, specialized studies and research.

**5. Course Outcomes**

Upon the successful completion of the course, learners will be able to

<b>CO Nos.</b>	<b>Course Outcomes</b>	<b>Level of learning domain (Based on revised Bloom's)</b>
CO1	Describe the importance, types and requirements of vehicle maintenance and related records and schedules.	K2, S2
CO2	Practice the engine overhauling, reconditioning; methods, procedures, tools of cylinder, valves and other engine components.	K3, S2
CO3	Demonstrate the maintenance procedures of clutch, gearbox, steering system, braking system, wheel alignment, door actuating systems and body tinkering	K3, S2
CO4	Demonstrate the construction, testing, fault diagnosis and maintenance of battery, starter motor, alternator, DC generator, ignition, lighting and dashboard instruments.	K3, S2
CO5	Describe the different service and maintenance aspects of fuel system, lubrication system and calibrate of fuel injection pump.	K2, S2

## 6. Correlation of COs with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	H	H	M	H	M	M					L		M	M
CO2	H	H	M	H	M	M					L		H	H
CO3	H	H	M	H	M	M					L		M	H
CO4	H	H	M	H	M	M					L		M	H
CO5	H	H	M	H	M	M					L		M	H

H- Strong; M-Medium; L-Low

## 7. Course Content

### UNIT – I: MAINTENANCE OF RECORDS AND SCHEDULES

L-9 P-6

Importance of Maintenance, Preventive (Scheduled) and Breakdown (Unscheduled) Maintenance, Requirements of Maintenance, Preparation of Check Lists. Inspection Schedule, Maintenance of Records, Log Sheets and Other Forms, Safety Precautions in Maintenance.

### UNIT – II: ENGINE MAINTENANCE

L-9 P-6

Dismantling of Engine Components and Cleaning, Cleaning Methods, Visual and Dimensional Inspections, Minor and Major Reconditioning of Various Components, Reconditioning Methods, Engine Assembly, Special Tools Used for Maintenance Overhauling, Engine Tune Up.

### UNIT – III: CHASSIS & BODY MAINTENANCE

L-9 P-6

Chassis-Mechanical and Automobile Clutch and Gear Box, Servicing and Maintenance, Maintenance Servicing of Propeller Shaft and Differential System. Maintenance and Servicing of Suspension Systems. Brake Systems, Types and Servicing Techniques. Steering Systems, Overhauling and Maintenance. Wheel Alignment, Computerized Alignment and Wheel Balancing. Body-Vehicle Body Maintenance, Minor and Major Repairs. Door Locks and Window Glass Actuating System Maintenance

### UNIT – IV: ELECTRICAL AND ELECTRONICS SYSTEM MAINTENANCE

L-9 P-6

Testing Methods for Checking Electrical Components, Checking Battery, Starter Motor, Charging Systems, DC Generator and Alternator, Ignitions System, Lighting Systems. Fault Diagnosis and Maintenance of Modern Electronic Controls, Checking and Servicing of Dash Board Instruments, Maintenance of Electronics System - on Board Diagnostics.

### UNIT – V: MAINTENANCE OF INTAKE, EXHAUST, FUEL, COOLING & LUBRICATION SYSTEM

L-9 P-6

Servicing and Maintenance of Fuel System of Different Types of Vehicles, Calibration and Tuning of Engine for Optimum Fuel Supply. Cooling Systems, Water Pump, Radiator, Thermostat, Anticorrosion and Antifreeze Additives. Lubrication Maintenance, Lubricating Oil Changing, Greasing of Parts, Maintenance of Intake and Exhaust Systems

**TOTAL: 75 Periods**

## 8. Practicals

### List of Experiments

1. Study and Layout of an Automobile Repair, Service and Maintenance Shop.
2. Study and Preparation of Different Statements/Records Required for the Repair and Maintenance Works.
3. Cylinder Boring - Checking the Cylinder Bore, Setting the Tool and Boring.

4. Valve Grinding, Valve Lapping - Setting the Valve Angle, Grinding and Lapping and Checking for Valve Leakage
5. Minor and Major Tune Up of Gasoline and Diesel Engines
6. Study and Checking of Wheel Alignment - Testing of Camber, Caster
7. Testing Kingpin Inclination, Toe-In and Toe-Out.
8. Simple Tinkering, Soldering Works of Body Panels, Study of Door Lock and Window Glass Rising Mechanisms
9. Brake Adjustment and Brake Bleeding.
10. Practice the Following:
  - i. Adjustment of Pedal Play in Clutch, Brake, Hand Brake Lever And Steering Wheel Play
  - ii. Air Bleeding From Hydraulic Brakes, Air Bleeding of Diesel Fuel System
  - iii. Wheel Bearings Tightening and Adjustment
  - iv. Adjustment of Head Lights Beam
  - v. Removal and Fitting of Tyre and Tube
11. Calibration of Fuel Injection Pump

**Total: 30 Periods**  
**Total (45+30): 75 periods**

#### **9. Text Book**

1. John Duke "Fleet Management", McGraw-Hill Co. 1984.

#### **10. References**

1. James D Halderman - Advanced Engine Performance Diagnosis – PHI - 1998.
2. Service Manuals from Different Vehicle Manufacturers.