

AE-411: Vehicle Maintenance & Tribology

L	T	P	Credit	Area		CWS	PRS	MTE	ETE	PRE
3	0/1	2/0	4	DEC		15/25	25/-	20/25	40/50	-

Objectives: To familiarize the students with the engine maintenance parameters, schedules, chassis maintenance of electrical systems, cooling systems, lubrication system.

AE-411: Vehicle Maintenance & Tribology		Contact Hours
Unit-1	Introduction: nature of surfaces and contact, surface topography, friction and wear mechanisms and effect of lubricants, methods of fluid film formation. Lubrication Choice of lubricant type, oil, grease and solid lubricants, additives, lubrication systems and their selection, selection of pump, filters, piping design, oil changing and oil conservation. Failure of tribological components failure analysis of plain bearings, rolling bearings, gears and seals, wear analysis using SOAP and Ferrography	6
Unit-2	Maintenance of records and schedules: 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	6
Unit-3	Engine maintenance – repair and overhauling 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. Performance evaluation for maintenance	8
Unit-4	Chassis maintenance - repair and overhauling: Mechanical and automobile clutch and gear box, servicing and maintenance, Maintenance servicing of propeller shaft and differential system. Maintenance &servicing of suspension systems. Brake systems, types and servicing techniques. Steering Systems, overhauling and maintenance. Wheel alignment, computerized alignment and Wheel balancing	8
Unit-5	Maintenance of automotive electrical system servicing and repairs: Testing methods for checking electrical components, checking battery, starter motor, Charging systems, dc generator and alternator, ignitions system, lighting systems. Fault Diagnosis and 92 maintenance of modern electronic controls, checking and servicing of Dash board instruments	8
Unit-6	Maintenance of fuel system, cooling systems, lubrication system and vehicle Body: 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. Vehicle body maintenance, minor and major repairs. Door locks and window glass actuating system maintenance	6
	Total	42

Reference Books:

1	John Duke ,”Fleet Management”,–Publisher- McGraw-Hill Co, USA (ISBN -13: 978- 0070174108), 1984
2	Kitchin.L.D ,”Bus Operation”., Publisher - Illiffee and Sons Co., London, III edition (ISBN: B0007JG0US), 1992
3	Government Motor Vehicle Act –Publication on latest act to be used as on date

Course Outcomes

CO1	To understand basics of friction, wear and lubrication mechanism.
CO2	To understand Maintenance of records and schedules
CO3	To understand Engine maintenance and Performance evaluation for maintenance
CO4	To understand Chassis maintenance with Wheel alignment, computerized alignment and Wheel balancing
CO5	To understand Maintenance of automotive electrical system servicing and repairs
CO6	To understand Maintenance of fuel system, cooling systems, lubrication system and vehicle Body

CO-PO/PSOMatrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	2	0	0	0	0	0	0	2	2	1	1
CO2	3	3	2	3	1	0	0	0	0	0	0	1	2	1	1
CO3	3	3	3	3	1	0	0	0	0	0	0	2	3	3	2
CO4	3	3	3	3	1	0	0	0	0	0	0	1	3	3	2
CO5	2	2	2	2	2	0	0	0	0	0	0	1	2	2	2