



Teaching Scheme			Credits	Examination Marks				Total Marks
L	P	OJT		Theory		Tutorial/ Practical		
			University exams (ESE)	Progressive Assessment (PA)	External Practical /viva Exam(ESE)	Internal evaluation Practical /viva Exam(PA)		
3	-	-	3	50	-	-	-	50

Course Content:

Unit No.	Content	Hrs
1	<p>STARTING SYSTEM: Idea of engine starting-system circuit. Kick-starting system of 2 wheelers. Starting of mopeds.</p> <p>IGNITION SYSTEM: Idea of Battery-and-coil ignition circuit and its working. Compression ignition of diesel engines.</p> <p>LUBRICATION SYSTEM: Lubrication in 2 stroke engines - petrol and oil-injection. Lubrication in 4 stroke multi-cylinder petrol/diesel engines. Dry and wet sump lubrication. Full pressure and semi-pressure lubrication. Oil pump types. Oil pump drive, relief valve; pressure gauge. Oil filters. Full-flow and by-pass type filtering systems. Crankcase dilution, crankcase ventilation. Positive Crankcase Ventilation. Properties and functions of a good lubricating oil. Additives. Gradation of lubricating oil due to viscosity. SAE numbers. Service rating. 2T and Super 2T oils for use in 2-s engines.</p>	10
2	<p>COOLING SYSTEM: Necessity of cooling of I.C. engines. Methods of cooling-air cooling, water cooling, liquid cooling. Shape of cooling fins. Field of application of air cooling. Water cooling system - Thermosiphon system, pump system, thermostat system of cooling. Thermostat - types. Radiators-different types, their construction and function. Pressurized cooling system; radiator pressure-cap, surge tank. Cooling water temperature gauge. Antifreeze and anti-corrosive additives. Coolants. Flushing of cooling system.</p> <p>AUTOMOBILE ENGINE FUELS: Types of fuels. Influence of structure. Calorific value. Requirements in fuels for I.C. engines. Properties. Fuel rating. Additives for S.I. and C.I. engine fuels. Specifications of petrol and diesel. Leaded and un-leaded petrol, Low Sulphur diesel. Enhancing Power output- Nitrox injection. Non-conventional fuels - LPG, CNG ethanol-mixed petrol. Properties, method of manufacture and their performance as I.C. engine fuels. Engine modifications required. Dual mode engine. Idea of Electric Vehicles and Hybrid Vehicles.</p>	08
3	<p>FUEL SYSTEM OF DIESEL ENGINES: Fuel supply system. Filters (primary and secondary); positioning of filters. Feed pump. Solid and air injection system. Fuel injection pump, different types- plunger, distributor pump, their construction and working. Injectors. Governors. Types of governing. Combustion process in diesel engine. Diesel knock. Electronically Controlled Diesel Injection Pump. Common Rail Direct Injection. Piezoelectric effect and its use in CRDI.</p>	08
4	<p>FUEL SYSTEM OF PETROL ENGINES: Gravity feed system used in 2-</p>	08



GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Bachelor of Vocation (B.Voc), 4th Semester

Branch: Automobile Servicing

Subject Name: Automobile Engine Systems

Subject Code: 1140101

**With effective
from academic
year 2018-19**

	wheelers. Fuel supply circuit of 4-wheelers. Mechanical and electrical fuel pump. Electric fuel gauge. Petrol fuel filter. Air/fuel ratio. Variation of air/fuel ratio with speed. Air cleaners (wet & dry). Cyclone filter. CARBURETOR - Function and principle of working of simple carburetor. Carburetor controls- throttle, choke. Types of Carburetors- fixed jet carburetor (Solex type) and constant vacuum carburetors used in YAMAHA motorcycle. Twin-barrel carburetors. Classification of carburetors. Disadvantages of carburetors. Phenomenon of combustion and detonation. Pre-ignition.	
5	FUEL INJECTION SYSTEMS (PETROL ENGINE): TBI, MPI; the Electronic Module. Advantages of Electronic Fuel Injection (EFI). Block diagram of the EFI. The Air Intake System and the Idle Air Control System. Fuel Delivery System. Various sensors used with the ECM, their location and purpose. Fuel Injector. Idea of Gasoline Direct Injection ENGINE PERFORMANCE AND TESTING: Various losses in an engine. Heat balance, Morse method of finding IHP, Calculation of various quantities like IHP, BHP, mechanical efficiency, thermal efficiency, relative efficiency, overall efficiency, specific fuel consumption. Performance curves.	08
Total Hours:		42

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks				
R Level	U Level	A Level	N Level	E Level
5	15	15	10	5

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

Reference Books:

1. Automotive Engines, A.K. Babu, Khanna Publishing House