

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: V AUTOMOBILE ENGINEERING

Subject Name: **Automobile Engines**

Subject Code: **150201**

Teaching Scheme				Evaluation Scheme		
Theory	Tutorial	Practical	Total	University Exam (Theory) (E)	Mid Sem Exam (Theory) (M)	Internal Assessment (I)
4	0	2	6	70	30	50

Sr. No.	Course content
1.	Engine: Classification of engine types (including construction of two stroke and four stroke engines), Engine parts/aggregates and their functions & operations. Phenomena of scavenging.
2.	Modern Power Plants: Stratified charged engine, Wankel engine, Multi-fuel engine, Sterling engine.
3.	Fuels: Types of fuel, properties. <ul style="list-style-type: none">• Fuel supply system in SI engine Fuel supply system layout, Fuel feed pump, Filters, Carburetion, Types of carburetors, Mixture requirements, Idling, Cold starting, Economy, Power and acceleration, Chokes petrol injection, Multi-point fuel injection.• Fuel supply system in CI engine Fuel injection pump, fuel feed pump, injectors, nozzles, cold starting devices (glow plugs), types of governors, Common Rail Diesel Injection (CRDI) System.• Modern Fuels Biogas, Biodiesel, Hydrogen, LPG, CNG and alcohols.
4.	Process of Combustion in Engines: Flame propagation, Combustion phenomena, Types of combustion chambers, Detonation, knocking, Knocking parameters, Knock ratings, Antiknock agents, Pre-ignition, Dual Timing Spark Ignition system.
5.	Engine Cooling Systems: Types of cooling systems (water & air cooling), Types of cooling fans, Water pump, Radiators, Thermostat, Coolant/anti freeze solution.
6.	Lubrication System: Functions & types of lubrication systems and it's components including Engine Lubrication circuit, Types of Lubricating pumps, Oil coolers, Types of oils, Lubricant properties and additives for lubricants, Big end & small end bearings, Bush bearings, Thrust bearings

	and bimetallic bearings.
7.	Intake and Exhaust System: Exhaust/Intake systems, Types of air cleaners, Supercharger, Turbo charger, Silencers, Catalytic convertor.
8.	Air Pollution: Emission norms, Exhaust gas emission constituents and analysis, Orsat apparatus, Modern methods and Gas chromatography.
9.	Engine Performance and Testing: Study of various performance parameters, Valve timing, Friction losses, Ignition timing, Compression ratio, Inlet temperature etc., Measurement of power, Fuel consumption, Air-fuel ratio, Efficiency, Heat balance sheet, Engine troubleshooting.

List of Practical:

1. Performance test on two stroke petrol engine.
2. Performance test on 4-stroke, 4-cylinder diesel engine.
3. Performance test on 4-stroke, 4-cylinder petrol engine.
4. Morse test on four stroke four cylinder petrol engine.
5. Experimental study of smoke meter.
6. Study of air pollution from I.C. engine.
7. Study of ignition systems.
8. Study of cooling, lubrication systems.
9. Study of carburetors.
10. Study of fuel injection system.
11. Subject Seminar.

Reference Books:

1. IC Engine by Sharma & Mathur, TMH.
2. IC Engine by Elliot.
3. Vehicle Technology by Heinz Heizler.
4. IC Engine by Maleev.
5. IC Engine by Heldt.
6. Engine troubleshooting, Cummins Engine, Columbus.