GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering
Subject Code: 3721109
I.C. Engine and Automobile Technology
SEMESTER: II

Type of course: Core - IV

Prerequisite: - Nil

Rationale: All automotive vehicles are powered by automobile engines. Hence the fundamental knowledge of automobile engine is most essential for an automobile engineer. This course will help the students to get fundamental knowledge in working of various types of engines, and their different associative systems like lubricating systems, cooling systems, fuel systems, etc. Knowledge of this course will also be helpful to the students in recent advancements in engines and other associative systems.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1.	**Unit-I Introduction to I.C Engine**:; Engine types and their operation; classification; Actual cycle; air fuel cycle; combustion charts (Equilibrium); Two stroke engines; four stroke engine; characteristics of engines; air capacity of engine; valve timing diagram; importance of volumetric efficiency Fundamentals of Automotive Electronics, Microprocessor and micro computer applications in automobiles, Components for engine management system.	10	**24**
2.	**Unit-II Engine Components, Material, construction and design aspects**; piston assembly; connecting rod; crankshaft; cylinder head; cylinder block; flywheel, ports; valves; valve actuating mechanism; cams; camshaft drives; vibration damper.	8	**18**
3.	**Unit-III Fuel Supply in SI and CI Engines**: Carburetion and mixture requirements; Transfer pump; Carburettors - types, constructional and design aspects; Mixture distribution and inlet manifold; The concept of multipoint fuel injection system, Fuel Supply in CI Engines; Injection system components; Jerk and Distributor pumps; Mechanical and Pneumatic governors; Injectors. CRDI system	10	**24**
4	**Unit-IV**Stratified Charged; Low heat rejection engine; four / three valve engine; OHC engine; MPFI; VVT; cam less engine; New engine technology; Recent developments in I. C. engines.	7	**17**
5	**Unit-V**Automotive electrical system; Basic transmission systems;	7	**17**

	suspension systems; steering systems; tyre and wheel; Braking System handling and maintenance; Troubleshooting and repairs.		

Reference Books:

1. Introduction to Internal Combustion Engines", Richard Stone, McMillan,London
2. Internal Combustion Engines Fundamentals – John B. Heyhood, McGrawHill
3. Vehicle and Engine Technology – HeinHeister
4. I.C. Engine by Maleev V. L., McGraw Hill Book,Co.
5. I. C. Engines –Ferguson
6. I. C. Engines – C. Fayette Taylor & Edward S. Taylor, International text bookcom
7. I. C. Engine & Air Pollution – E. F. Obert, Harper & Row Publishers, NewYork
8. Automotive Engines - Herbert E. Ellinger
9. Automobile Electrical & Electronic Equipments - Young, Griffitns - Butterworths, London
10. Fundamentals of Automotive Electronics - V. A. W.Hilliers - Hatchin,London
11. I.C Engine, R.K. Singhal
12. I.C Engine, Mathur and Sharma
13. I.C Engine, Domkundwar

Course Outcome:

Sr. No.	CO statement	Marks % weightage
CO-1	Acquire fundamental knowledge of Internal combustion Engine, its terminology, characteristics	25
CO-2	Basic understanding of different parts of engine construction Materials,	15
CO-3	Knowledge of Fuel Supply in internal combustion Engines	24
CO-4	Understanding of Stratified Charged, New and Recent developments in I. C. engines	16
CO-5	Acquire knowledge of engine electrical, transmission, suspension, steering and its maintenance	20

List of Experiments:

1. To Study various engine components, material and designaspects.
2. Testing of Internal combustion engine as per ISStandards.
3. Study and Performance analysis of two stroke PetrolEngine.
4. Study and Performance analysis of four stroke PetrolEngine.
5. Study and Performance analysis of four stroke DieselEngine.
6. Study of MPFI and CRDIsystems
7. Study of ignition , cooling, lubricationsystems
8. Study of clutch and Transmissionsystems
9. Study of automotive brakes , suspension and steeringsystems
10. Study of Recent developments in the field of I.C. Engine andAutomobile.