LEVEL V COURSES

5050 - AUTOMOBILE ENGINES - III										
Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)					
					Theory		Practical Ex.		Total	
Lectures	Practical	Credits								
3	2	5	25	25	3 Hrs	100	-		150	
Pre-requisite		Source	Semester		Theory	Test	Total	TW	PR	Gr Total
4061					75	25	100	50	–	150

Rationale: This course deals with topics, which are required for those who wish to go in for specialisation in the field of Automobile Engineering. This course consists of topics such as Gas Turbine, Dual Fuel and Multifuel engines, Stratified engine, Sterling engine, Wankel rotary engine, Automotive emission controls and Multipoint fuel Injection system. With the technology making rapid strides, it has been felt that detailed discussion regarding Automotive Emissions and their controls as also on M.P.F.I. will be of great help to the student. At the same time the course content has been kept to the elementary level avoiding unnecessary calculations and derivations.

To sum up, the course will go a long way in importing additional knowledge to the students which will prove very useful in their future careers.

COURSE CONTENTS	Hrs	Mks
1. GAS TURBINES Introduction, Gas turbine V/s reciprocating I.C. Engines, Classification of gas turbines – open cycle and closed cycle, Typical gas turbine chamber, Automotive gas turbines – their advantages and disadvantages – configuration, Chysler like shaft Gas Turbine Unit	8	16
2. OTHER COMBUSTION ENGINES DUAL FUEL AND MULTI FUEL ENGINES: Introduction of Dual Fuel Engines, The working principle, Advantages. Multi fuel Engines – their Characteristics. Suitability of various engines as multi fuel engines, and performance. STRATIFIED CHARGE ENGINE: Introduction, Advantages of leaner overall F/A mixtures, General characteristics, Application, Advantages and Disadvantages. STERLING ENGINE: Working principle, Advantages and disadvantages. WANKEL ROTARY ENGINE: Introduction, The working principle, Features, Future development, Application.	8	24
3. AUTOMOTIVE EMISSION AND CONTROLS Introduction, Positive cranlicas ventilation system, Need for fuel vapour emission controls. Fuel vapour emission control systems – (a) Charcoal canister (b) Separating vapour from fuel (c) Sealed fuel tank (d) Carburettor insulation (e) Vapour storage in crankcase. Exhaust emissions and it's cleaning by – (a) Controlling the A/F mixture, (b) controlling the combustion process (c) Treating the exhaust gas. Diesel emission – Factors affecting emission. Diesel smoke and control, Causes of smoke, Mechanism of smoke formation, Control of smoke. Diesel odour and control – (a) Mechanism of odour production (b) Factors affecting odour production (c) Control of odour. Comparison of diesel and gasoline emissions.	18	30
4. MULTI POINT FUEL INJECTION ENGINES Introduction, Advantages and disadvantages, Working principle, Types of sensors used, Types of actuators, Microprocessor and Interfacing cards, Types of systems –	14	30

Port, T.B.I., Timed and continuous, Advantages and disadvantages of each. Electronic fuel injection – Bosch L type, cadellac part type, fuel delivery system, sole operated injection valve.	48	100
Total		

REFERENCE BOOKS:

1. Internal Combustion Engines by M.L. Mathur, R.P. Sharma.
2. Automobile Engineering Vol. II By Dr. Kirpal Singh
3. Automotive Mechanics by Crouse / Anglen.

TERM WORK:

It will consist of preparation of a Journal on the following:

1. Study of construction and workings of a Gas turbine and its advantages and disadvantages over the reciprocating engine.
2. Study of Dual and Multifuel Engines.
3. Study of construction, working and merits and demerits of (a) Stratified charge engine (b) Stirling charge engine (c) Wankel Rotary engine.
4. Study of – (a) Gasoline engine emission control system (b) Diesel engine emission control system.
5. Study of Multi point fuel injection system.