4th Semester	RAU4C002	Automotive Engine	L-T-P 3-0-0	3 CREDITS

MODULE- I (10 hrs)

Introduction to Automotive Engine: -

About engines, engine systems, basic engine terminology, types of engine, classification of I.C engines, engine cycles, construction working and port timing diagrams of two stroke petrol and diesel engines, construction working and valve timing diagrams of four stroke petrol and diesel engines, comparison of two stroke and four stroke engines, differences between petrol and diesel engines, firing order.

MODULE- II (10 hrs)

Fuel Supply Systems and Performance: -

Fuel supply system for SI engines, carburetors (Simple and Solex), fuel supply system for CI engines, fuel injection system, classification of different parts of fuel supply system for both SI and CI engines, calculation of air fuel ratio for petrol and diesel.

Losses in the engine, mean effective pressure, fuel consumption, and volumetric efficiency, performance tests in IC engines and heat balance, performance curve.

MODULE- III (8 hrs)

Lubrication and Cooling Systems: -

Function of lubrication systems, types of lubrication systems- mist, wet and dry sump lubrication systems, properties and designation of lubricants.

Methods of cooling systems- air- and water-cooling systems, properties of coolants, cooling agents.

MODULE- IV (8 hrs)

Combustion and Power Boosters: -

Phenomenon of combustion in SI engines, stages of combustion, flame propagation, rate of pressure rise, abnormal combustion, effect of engine variables on knocking, fuel quality for SI engines, octane rating, combustion chambers for SI engines.

Phenomenon of combustion in CI engines, stages of combustion, ignition delay, factors affecting delay period, knock in CI engines, comparison of knock in SI and CI engines, direct and indirect injection diesel engines, combustion chambers, supercharging and turbocharging methods.

MODULE- V (9 hrs)

Supercharging and Turbocharging: -

Supercharging: Need for supercharging, Effect of supercharging, types of supercharger, methods of supercharging, thermodynamic analysis of supercharged engine cycle, limitations of supercharging, Turbocharging: Effect of turbocharging, methods of turbocharging, thermodynamic analysis of turbocharged engine cycle, limitations of turbocharging, comparison of Supercharging and Turbocharging.

Books:

- V, Ganesan. "Internal Combustion Engines", Tata-McGraw Hill Publishing Co., New Delhi, 1994.
- Ramalingam.K. K, "Automobile Engineering", SCI-Tech Publication Pvt. Ltd, 2005.
- Sing Kirpal, "Automobile Engineering" Vol. Ii, Standard Publishers Distributors, 1971
- Heywood, Internal Combustion Engines
- ObertE. F, Internal Combustion Engine Analysis and Practice, International Text Book Co., Scranton, Pennsylvania , 1988.
- Heldt P.M, High Speed Combustion Engines, Oxford IBH Publishing Co, 1964.
- Dicksee. C.B, Diesel Engines, Blackie and Son Ltd, London, 1964.
- Malvee V.M, Diesel Engine Operation and Maintenance, McGraw Hill, 19