**ME6016 ADVANCED I.C ENGINES**

**UNIT I SPARK IGNITION ENGINES 9**

Mixture requirements – Fuel injection systems – Monopoint, Multipoint & Direct injection - Stages of combustion – Normal and Abnormal combustion – Knock - Factors affecting knock – Combustion chambers.

**UNIT II COMPRESSION IGNITION ENGINES 9**

Diesel Fuel Injection Systems - Stages of combustion – Knocking – Factors affecting knock – Direct and Indirect injection systems – Combustion chambers – Fuel Spray behaviour – Spray structure and spray penetration – Air motion - Introduction to Turbocharging.

**UNIT III POLLUTANT FORMATION AND CONTROL 9**

Pollutant – Sources – Formation of Carbon Monoxide, Unburnt hydrocarbon, Oxides of Nitrogen, Smoke and Particulate matter – Methods of controlling Emissions – Catalytic converters, Selective Catalytic Reduction and Particulate Traps – Methods of measurement – Emission norms and Driving cycles.

**UNIT IV ALTERNATIVE FUELS 9**

Alcohol, Hydrogen, Compressed Natural Gas, Liquefied Petroleum Gas and Bio Diesel - Properties,Suitability, Merits and Demerits - Engine Modifications.

**UNIT V RECENT TRENDS 9**

Air assisted Combustion, Homogeneous charge compression ignition engines – Variable Geometry turbochargers – Common Rail Direct Injection Systems - Hybrid Electric Vehicles – NOx Adsorbers - Onboard Diagnostics.

**TOTAL : 45 PERIODS**

**TEXT BOOKS:**

1. Ramalingam. K.K., "Internal Combustion Engine Fundamentals", Scitech Publications, 2002.

2. Ganesan, "Internal Combustion Engines", II Edition, TMH, 2002.

**REFERENCES:**

1. Mathur. R.B. and R.P. Sharma, "Internal Combustion Engines"., Dhanpat Rai & Sons 2007.

2. Duffy Smith, "Auto Fuel Systems", The Good Heart Willcox Company, Inc., 1987.

3. Eric Chowenitz, "Automobile Electronics", SAE Publications, 1995