

FUELS AND LUBRICANTS 3 0 0 3

MODULE I PRODUCTION OF FUELS AND LUBRICANTS

Structure of petroleum, refining process, fuels, thermal cracking, catalytic cracking, polymerization, alkylation, isomerisation, blending, products of refining process. Introduction to production of alternative fuels such as liquid fuels such as alcohols, biodiesel and gaseous fuels such as LPG, CNG.

Production of lubricating oil base stocks, manufacture of finished automotive lubricants.

MODULE II FUEL PROPERTIES, TESTING AND RATING OF FUELS

Thermo-chemistry of fuels, properties and testing of fuels, relative density, calorific value, distillation, vapour pressure, flash point, spontaneous ignition temperature, viscosity, pour point, flammability, ignitability, diesel index, API gravity, aniline point etc.

SI Engine combustion-normal combustion, knocking, octane rating, fuel requirements. CI Engine-combustion, diesel knock, cetane rating, fuel requirements. Additive - mechanism, requirements of an additive, petrol fuel additives and diesel fuel additives – specifications of fuels.

MODULE III THEORY OF LUBRICATION AND LUBRICANTS

Engine friction: introduction, total engine friction, effect of engine variables on friction, hydrodynamic lubrication, elasto hydrodynamic lubrication, boundary lubrication, bearing lubrication, functions of the lubrication system, introduction to design of a lubricating system.

Specific requirements for automotive lubricants, oxidation deterioration and degradation of lubricants, additives and additive mechanism, synthetic lubricants, classification of lubricating oils, properties of lubricating oils, tests on lubricants. Grease, classification, properties, test used in grease.

TEXT BOOKS

1. Ganesan.V., "Internal Combustion Engineering", Tata McGraw-Hill Publishing Co., Delhi, 2003.
2. M.L. Mathur, R.P.Sharma "A course in internal combustion engines", Dhanpatrai pub., 2003.
3. Obert.E.F "Internal Combustion Engineering and Air Pollution", International book Co., 1988.

REFERENCES

1. Brame, J.S.S. and King, J.G. – Fuels – Solids, Liquids, Gaseous.
2. Francis, W – Fuels and Fuel Technology, Vol. I & II
3. **Hobson, G.D. & Pohl.W- Modern Petroleum Technology**