GUJARAT TECHNOLOGICAL UNIVERSITY

Diploma in Automobile Engineering

Semester: IV

Subject Name: FUELS AND LUBRICANTS

Sr. No.	Course Content
1.	**CRUDE PETROLEUM** Theory of origin and method of searching the crude oil, classification of crude Petroleum
2.	**CLASSIFICATION AND MANUFACTURING OF FUELS** Types of fuels, classification of hydro-carbon, Structure of various hydrocarbons, characteristics of various hydro carbons, Petroleum refining, Different refineries in India, Classification of refinery products, requirements of an ideal fuel
3.	**PROPERTIES AND ADDITIVES OF FUELS** Properties of gasoline and their effects on engine performance, Procedure of testing of the gasoline properties, preparation of commercially suitable automotive fuel, Blending and treatment of gasoline, various gasoline additives, Various properties of Diesel fuel, Effects of properties of Diesel on Engine performance, Procedure to test the properties of the diesel fuel
4.	**COMBUSTION AND ANTIKNOCK RATING OF FUELS** Process of combustion in S.I. and C.I. Engines, Phenomena of Detonation and Diesel knock, Effects of detonation on Engine performance, Factors affecting detonation and their prevention, fuel rating, octane no., highest useful compression ratio (HUCR), Procedure of rating the gasoline by CRC method on CFR engine, commercial grades of petrol, cetane no., Relationship between octane number and engine performance, correlation between octane number and cetane no.
5.	**LUBRICANTS AND THEIR MANUFACTURING** Fluid friction and theory of lubrication, Functions of lubricants, classification of different lubricants, Origin of lubricants, Distillation process to manufacture lubricating oil, Various treatments given to the lubricating oil, Types of greases, characteristics of greases
6.	**PROPERTIES, GRADATION AND ADDITIVES OF LUBRICANTS** Properties of lubricating oil, Gradation of lubricating oil, two-stroke engine oil, Procedure of testing the properties of lubricating oil, Function and type of additives of lubricating oil, Main features of various instruments required for testing Lubricants, Safety aspects during testing of fuels and lubricants, Deterioration of lubricating oil in the engine, Performance features of lubricating oil in the engine

7.	**ALTERNATIVE FUELS FOR I.C.ENGINE** Introduction, various alternative fuels like Alcohol, CNG, LPG, LNG, Hydrogen, Bio-diesel. Their Availability, properties, specifications, Production, Safety, Storage, performance and emission characteristics, Merits & demerits of various alternative fuels, Fuel cell, Technology Development Trend of such AFV's.

SUGGESTIVE LIST OF LABORATORY EXPERIENCES

1. Determination of viscosity of given sample of fuel oil at different temperature.
2. Determination of viscosity of lubricating oil at different temperature.
3. Determination of flash and fire point of given sample of fuel.
4. Determination of specific gravity of given sample of fuel by westphal Balance
5. Determination of absolute viscosity of diesel fuel using u-tube viscometer.
6. Study of distillation process of crude oil.
7. Study of CFR engine and knock meter.
8. Determination of API gravity of given sample of fuel.
9. Determination of cloud and pour point of given sample of oil.

REFERENCE BOOKS:

Sr no.	Title	Author
1	Fuels and lubricating oils	B.Pugh and J.M.A. Court
2	Internal combustion engines	V.M. Domkundwar
3	Basic Automobile Engg.	C.P.Nakra,
4	Automobile Engineering, Vol-I	K.M.Gupta,
5	Alternative Fuels Guidebook	R.L.Bechtold
6	Internal Combustion Engines	L.C. Litchy
7	Internal Combustion Engines	Mathur & Sharma
8	Fuels and Lubricants	M.Popovich and Haring