

32172- ALTERNATE FUELS AND ENERGY SYSTEM

DETAILED SYLLABUS

UNIT- I INTRODUCTION

Estimation of petroleum reserve - World Energy Scenario - Energy Survey of India – Oil industry background and history – survey of oil consumption - Availability of petroleum products – types – uses - air craft fuels – alternate fuels – list of alternate fuels - Need for alternate fuel – Availability of alternate fuels.

UNIT- II ALCOHOLS

Introduction - properties of alcohol as fuel - uses of alcohol fuels – alcohol availability – alcohol production – methanol – ethanol – impact of incremental vehicle cost – vehicle technology and vehicle emission – use of low level blends – vehicle emission – dedicated vehicles – fuel flexible vehicle – variable fuelled vehicle – air quality benefits of alcohol fuels – methanol vehicles – fuel characteristics – fuel additives – handling of methanol – methanol health and safety.

UNIT- III NATURAL GAS, LPG, HYDROGEN AND BIOGAS

Availability of CNG - automotive gasoline – composition – types – properties – additives – effect of emissions - modification required in engines – performance and emission characteristics of CNG and LPG in SI & CI engines. Performance and emission for LPG – Hydrogen – Storage and handling, performance and safety aspects.

UNIT- IV VEGETABLE OILS

Introduction - Various vegetable oils for engines – Etherification – Performance in engines – Performance and emission characteristics.

UNIT- V ELECTRIC AND SOLAR POWERED VEHICLES

Layout of an electric vehicle – advantage and limitations – Specifications – System component, Electronic control system – High energy and power density batteries – Hybrid vehicle – Solar powered vehicles. Fuel cell vehicles.

Text Book

1. Internal combustion engine, Ramalingam. K.K., SciTech publications, Chennai, 2003.
2. Energy today & tomorrow, Maheswar Dayal, I & B Horish India, 1982.

3. Alternative Fuels Guide Book, Bechtold,R.L., SAE, 1997.

Reference Book

1. Power Plant Engineering, Nagpal, Khanna Publishers, 1991.
2. Alcohols and motor fuels progress in technology, Series No.19, SAE Publication USA
3. 1980.
4. SAE Paper Nos.840367, 841156, 841333, 841334.
5. The properties and performance of modern alternate fuels – SAE Paper No.841210.
6. Automobile pollution, Dr.Saty kush, IVY Publishing House, Delhi – 110095.

OBJECTIVES

- To identify the different sources of fuels.
- To study the fuels and their energy levels
- To acquire knowledge of alternate fuels
- To learn about the changes in the engine design
- To study the various energy systems used in the automobiles.