

COURSE TITLE : **FUELS AND COMBUSTION**
COURSE CODE : **5020**
COURSE CATEGORY : **E**
PERIODS/WEEK : **4**
PERIODS/SEMESTER : **72**
CREDITS : **4**

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Fuels and Alternative energy options in Automobile Engineering	18
2	Theory of combustion in SI Engines	18
3	Theory of combustion CI engines	18
4	Supercharging & Automobile air conditioning system	18
	Total	72

OBJECTIVES

Upon the completion of study of this subject the student should be able to

MODULE I

- 1.0 Understand the different types of fossil and non fossil fuels
 - 1.1 State the various properties of SI and CI engine fuels
 - 1.2 Discuss the properties and performances of LPG,CNG, Alcohol as automobile fuels.
 - 1.3 Hydrogen and Bio-diesel as automobile engine fuel
 - 1.4 Discuss Bi-fuel and Dual fuel systems
 - 1.5 Explain the working of electric cars and hybrid vehicles
 - 1.6 Explain fuel cell working

MODULE II

- 2.0 Discuss the combustion phenomenon in SI engines
 - 2.1 State the stages in combustion of SI engines
 - 2.2 Explain the effects of engine variables in ignition lag and flame propagation
 - 2.3 Explain abnormal combustion process such as detonation , pre-ignition, and surface ignition in SI engines

MODULE III

- 3.0 Discuss the combustion phenomenon in CI engines
 - 3.1 Explain the stages in combustion of CI engines
 - 3.2 Identify the various air fuel ratios in diesel engines
 - 3.3 Distinguish the delay period and variables affecting the delay period
 - 3.4 Define the Diesel knock and its control

MODULE IV

- 4.0 Supercharging & Automobile air conditioning system.
 - 4.1 State the objectives of supercharging
 - 4.2 Explain super charging in SI and CI engines
 - 4.3 Compare the performance of supercharged engines
 - 4.4 Explain the methods of supercharging and turbo charging
 - 4.5 Automobile air conditioning system.

CONTENT OUTLINE

MODULE-1

Fossil and non fossil fuels

Properties of SI and CI engine fuels - Properties and performances- LPG,CNG, Alcohol.- Hydrogen and Bio-diesel - Bi-fuel and Dual fuel systems - electric cars ,hybrid vehicles - fuel cell

MODULE-2

Combustion phenomenon in SI engines

Stages of combustion in SI engines - the effects of engine variables- ignition lag - flame propagation - abnormal combustion -detonation , pre-ignition& surface ignition

MODULE-3

Combustion phenomenon in CI engines

Stages of combustion in CI engines - various air fuel ratios - delay period and variables affecting the delay period - Diesel knock and its control-

MODULE-4

Super charging & Air conditioning system

Super charging- Effects of super charging. Methods of supercharging and turbo charging. Lean burn engines-Automobile air conditioning system-Working-Components and thier location,Refrigerants , their properties, refrigeration controls.

TEXT BOOKS

- 1. A course in internal combustion engines - M L Mathur &R P Sharma

REFERENCE

- 1. Automobile Engg. Vol. 1 to 4 - Anil chikkara
- 2. Diesel engine reference Manual - L R C Lilly, Butter worths publications
- 3. Automotive fuel systems Vol I&II - T.K Garrets, SAE
- 4. Internal combustion engines - V Ganesan
- 5. Internal combustion engines theory and practice - S P Sen
- 6. Automotive emission control - Crouse & Anglin
- 7. Automobile Electricity & Electronics - Barry Hollembeak
- 8. Introduction to Internal combustion engines - Richard stone
- 9. Automobile engineering----R B Guptha

Halderman series- www.prenhall.com
Delmar series- www.delmar.com