

COURSE TITLE : AUTOMOBILE POWER PLANT
COURSE CODE : 2051
COURSE CATEGORY : B
PERIODS/WEEK : 4
PERIODS/SEMESTER: 60
CREDITS : 4

TIME SCHEDULE

Module	Topic	Periods
1	Understand the engine principle and fundamentals	15
2	Analyze fuel system in petrol engines	15
3	Analyze the fuel system in diesel engines	15
4	Understand engine lubrication system & cooling system	15
TOTAL		60

GENERAL COURSE OUTCOME

Sl .No.	sub	Student will be able to
1	1	Understand the working principle of petrol & diesel engine.
	2	Distinguish between petrol and diesel engine
	3	Identify various engine components
	4	Draw valve timing diagram.
2	1	Describe the petrol engine fuel system
	2	Identify various fuel system components
	3	Describe the working of Solex, SU carburettors.
3	1	Describe Diesel engine fuel system
	2	Identify various components in diesel fuel system.
	3	Explain the working of inline and distributor type fuel injection pumps.
	4	Describe the working of governors.
4	1	Understand engine lubrication system
	2	Specify lubricating oil properties
	3	Understand engine cooling system
	4	Identify various components in cooling system

SPECIFIC COURSE OUTCOME

MODULE- I

1.1.0 Understand the engine principle and fundamentals

- 1.1.1 Explain the working principle of petrol engine, 2 – stroke and 4-stroke
- 1.1.2 Explain the working principles of diesel engine, 2-stroke and 4-stroke
- 1.1.3 Distinguish between petrol engine and diesel engine
- 1.1.4 Compare between 2-stroke and 4-stroke engines
- 1.1.5 Classify the different types of engines
- 1.1.6 List the components in valve operating mechanisms
- 1.1.7 Explain valve timing diagram

MODULE- II

2.1.0 Analyze fuel system in petrol engines

- 2.1.1 Describe the petrol fuel system – different fuel feed system, petrol fuel filters and air cleaners
- 2.1.2 Illustrate the working of simple carburettor and carburettor classifications
- 2.1.3 Describe the working of Solex, SU carburettors.
- 2.1.4 Explain exhaust system

MODULE- III

3.1.0 Analyze the fuel system in diesel engines

- 3.1.1 Explain diesel fuel system with various components
- 3.1.2 List the various types of fuel injection system.
- 3.1.4 Describe, fuel injection pump for single and multi cylinder engines, distributor type pump, feed pump and hand primer
- 3.1.5 List diesel fuel filters.
- 3.1.6 Describe governors – purpose and types (Pneumatic and centrifugal governors)
- 3.1.7 Describe fuel injectors and its types

MODULE- IV

4.1.0 Understand engine lubrication system

- 4.1.1 Specify properties of lubricating oil
- 4.1.2 List the different types of grading of oil
- 4.1.3 Explain the working of engine lubrication
- 4.1.4 Classify the engine lubrication system
- 4.1.5 List lubricating oil pumps – gear type, vane type, plunger type and lobe type
- 4.1.6 Describe oil cooler, oil filter, pressure relief valve.

4.2.0 Understand engine cooling system

- 4.2.1 Explain the cooling system
- 4.2.2 Describe the air cooling system
- 4.2.3 Explain the thermo siphon system, pump circulation system, use of thermostat,
- 4.2.4 Describe the type of radiator core, functions of radiator cap
- 4.2.5 Explain the types of coolants – antifreeze agents in coolant
- 4.2.6 List the functions of cooling fans

CONTENT DETAILS

MODULE I

Basic engine terminology- TDC, BDC, Bore, Stroke, Swept volume, clearance volume, total volume, compression ratio. Working principle of 2-stroke and 4-stroke SI and CI engines. Comparison of SI and CI engine. Differentiate 2-stroke and 4-stroke engines. Classification of engine according to valve arrangement I-Head, L-Head, T- Head and F- Head engines. List out the components in valve operating mechanism. Valve timing diagram. Manifolds.

MODULE II

Different fuel feed system-AC mechanical pump and SU electrical pump. Petrol fuel filters, and air cleaners. Various air fuel ratios. Working of simple carburetors- classifications. Carburetors circuits-Float, Choke, Idling, slow speed, Normal, acceleration pump. Introduction to Electronic Fuel Injection systems. Types of mufflers.

MODULE III

Component layout of a conventional diesel fuel system. Types of solid fuel injection system- Jerk and distributor. Working principle of Inline and distributor type FIP, fuel feed pump. Types of diesel fuel filter. Working principle of fuel injector, types of fuel injector. Introduction to CRDI. Governors – purpose and types (Pneumatic and centrifugal governors)

MODULE IV

Properties of lubricating oil. Single and multi grade oils. Concept of lubrication, Working of engine lubrication. Engine lubrication system- Petroil, splash, pressure, dry sump and wet sump. Types of lubricating oil pumps (without description). Functions of oil cooler, oil filter, pressure relief valve. Cooling system, significance, Type-Air cooling system, thermo siphon system, pump circulation system, use of thermostat, type of radiator core, functions of radiator cap, types of coolants – antifreeze agents in coolant. Functions of cooling fans.

REFERENCE BOOKS

1. Kirpal Singh S - Automobile Engg., Vol. II – Standard Publications 12th E
2. R.B. Guptha - Automobile Engg. – Satya Prakasan 9th E
3. K.M.Guptha - Automobile Engg., Vol. I& II – Umesh Publications 1st E
4. Anil Chikara- Automobile Engg., Vol. I -Satya Prakasan 3rd E
5. William.H.Crouse - Automotive mechanics – McGraw-Hill Publications 10th E 6.
- K.K.Ramalingam - Automobile Engg., Theory and Practice – Scitech Publications 1st E 7.
- Dr.N.K. Giri - Automobile Technology – Khanna publishers 8th E
8. Mathur and Sharma - I.C. Engines – Dhanpat rai publications 2nd E 9.
- S.Sreenivasan - Automotive Mechanics - Mc-Grow Hill Publications 2nd E 10. Harban
- Singh Reyath - The Automobile – S.Chand Publication