

GROVET. Polytechnic Varshali

Branch: Mechanical Engg.

Semester: 5th

Subject:- Power Engineering (1625502)

Lecture plan:- Effective from 01-08-2020

Subject teacher:- Sh. Jitendra Kumar

Lecturer, Dept. of Mechanical Engg.

units	Topics to be covered	No. of Lectures	Books
Unit 1	<u>IC Engine:</u>	L1, L2	B1
	<u>1.1</u> Power cycles - Carnot, Otto, Diesel, Dual, Brayton cycle, representation on P-V, T-s diagram.	L3 & L4	"
	Simple Numericals on Otto cycle	L5	"
	<u>1.2</u> - classification of I.C Engines	L6	"
	<u>1.3</u> - Two stroke and four stroke Engines construction and working, comparison, valve timing diagram.	L7, L8	"
	<u>1.4</u> - Brief description of I.C Engine Combustion (SI & CI), scavenging, preignition, detonation, supercharging, Turbocharging.	L9, L10 & L11	"
Simple carburetor, M.P.F-I, fuel injection pump	L12 & L13	"	
<u>1.5</u> - List of fuels, Lubricant additives, and their advantages	L14	"	
Unit 2	<u>IC Engine testing and pollution control.</u>		
	<u>2.1</u> - Engine Testing → I.P, B.P, Mechanical, Thermal, relative and volumetric efficiency, BSFC, Heat balance sheet.	L15 & L16	B1
		L17 & L18	"
	<u>2.2</u> - Morse key test Motoring test	L19 & L20	"

Units	Topics to be covered	No. of Lectures	Books
	<u>2.3 - pollution control</u> • Pollutants in exhaust gases of petrol and diesel engines, their effects on environment, • Exhaust gas analysis for petrol and diesel engine, catalytic converters, • Bharat stage I, II, III ... Norms	L21, L22 & L23 L24 & L25. L26.	B1 " "
Unit 3	<u>AIR COMPRESSOR:</u> 3.1 - Introduction 3.2 - uses of compressed air classification of Air compressors, compression ratio, compressor capacity & Free Air delivered & swept volume definition. 3.3 - Reciprocating Air compressor - construction and working of single stage and two stage compressor. • Efficiency:— volumetric, isothermal and mechanical (simple Numerical) • Advantages of multi-staging. 3.4:- Rotary compressor - construction and working of screw, Lobe, vane, centrifugal compressor. • comparison and applications of reciprocating and rotary compressors • purification of air to remove oil, moisture and dust. 3.5 - Methods of energy saving in Air compressors.	L27 L28 & L29 L30 & L31 L32 L33 & L34 L35 L36 & L37 L38.	B2 & B3 " " " " " " " "

Units	Topics to be covered	No. of Lectures	Books
Unit 4.	<u>Gas Turbine and Jet propulsion:</u>		
	4.1 - Classification and applications of gas turbine.	L39	B2
	4.2 - Constant volume and constant pressure gas turbines.	L40	"
	• closed cycle and open cycle gas turbines & their comparison.	L41	"
	4.3 - Methods to improve thermal efficiency of gas turbine - Regeneration, inter-cooling, reheating using T-s diagram.	L42, L43 & L44	"
	4.4 :- Jet propulsion - • principle of turbojet, turbo propeller, Ramjet.	L45 & L46	B3
Unit 5	<u>4.5 :- Rocket propulsion -</u> • solid propellants, and liquid propellants • principle of liquid propellants Rocket engine.	L47 & L48 L49 & L50	B3 "
	Refrigeration and Air-conditioning		
	5.1 - Introduction. • COP of Heat pump and Refrigerator, • Tonnes of Refrigeration.	L51 L52	B2 & B3
	5.2 - Vapour compression system (VCRS) - • VCRS cycle, components of VCRS cycle. • Applications → water cooler, Domestic refrigerator, ice plant and cold storage.	L53 & L54 L55 & L56 L57	" " "
	5.3 → Psychrometry - properties of Air, Psychrometric chart and process.	L58 & L59 L60, L61 & L62	" "
	5.4 - Definition and Classification of AIR conditioning system	L63 & L64	"
<u>Books for Reference:-</u>			
B1 → I.C Engine by V. Ganeshan → TMH pub.			
B2 → Power plant Engg. by P.K Nag			
B3 → Applied Thermodynamics TMH publication → R.K. Rajput → Dhgapat Rai publication			