

Siruseri IT park, OMR, Chennai - 603103

## UNIT II - RECIPROCATING AIR COMPRESSOR

7	Classification and comparison, working principle, work of compression	T2	2	BB	L2	CO2	PO1, PO2 & PO3
8	work of compression - with and without clearance	T2	2	BB	L3	CO2	PO1, PO2 & PO3
9	Volumetric efficiency, Isothermal efficiency and Isentropic efficiency	T2	1	BB	L3	CO2	PO1, PO2 & PO3
10	Multistage air compressor with Intercooling	T2	2	BB	L3	CO2	PO1, PO2 & PO3
11	Working principle and comparison of Rotary compressors with reciprocating air compressors	T2	2	BB	L2	CO2	PO1, PO2 & PO3

**Suggested Activity: Assignment Given**

**Evaluation method: Evaluation of Assignment**

### UNIT III - INTERNAL COMBUSTION ENGINES AND COMBUSTION

12	IC engine – Classification, working, components and their functions.	R2	2	BB	L2	CO3	PO1
13	Ideal and actual : Valve and port timing diagrams	R2	1	BB	L2	CO3	PO1
14	p-v diagrams- two stroke & four stroke	R2	1	BB	L2	CO3	PO1
15	SI & CI engines – comparison	R2	1	BB	L2	CO3	PO1
16	Geometric, operating, and performance comparison of SI and CI engines.	R2	1	BB	L2	CO3	PO1
17	Desirable properties and qualities of fuels. Air-fuel ratio calculation – lean and rich mixtures	R2	2	BB	L2	CO3	PO1
18	Combustion in SI & CI Engines – Knocking – phenomena and control	R2	1	BB	L2	CO3	PO1

**Suggested Activity: Poster Presentation given to the students**

**Evaluation method: Evaluation of the Presentation**

### UNIT IV - INTERNAL COMBUSTION ENGINE PERFORMANCE AND SYSTEMS

19	Performance parameters and calculations.	R2	2	BB	L3	CO4	PO1, PO2
20	Morse and Heat Balance tests	R2	2	BB	L3	CO4	PO1, PO2
21	Multipoint Fuel Injection system and Common Rail Direct Injection systems	R2	1	BB	L2	CO4	PO1
22	Ignition systems – Magneto, Battery and Electronic	R2	1	BB	L2	CO4	PO1
23	Lubrication and Cooling systems	R2	1	BB	L2	CO4	PO1
24	Concepts of Supercharging and Turbocharging	R2	1	BB	L2	CO4	PO1
25	Emission Norms.	R2	1	BB	L1	CO4	PO1 & PO7

**Suggested Activity: Video Presentation Given to the students**

**Evaluation method: Evaluation of Video Presentation**

### UNIT V - GAS TURBINES

26	Gas turbine cycle analysis – open and closed cycle.	T2	2	BB	L3	5	PO1, PO2 & PO3
27	Performance and its improvement	T2	2	BB	L3	5	PO1, PO2 & PO3
28	Regenerative, Intercooled, Reheated cycles and their combinations	T2	3	BB	L3	5	PO1, PO2 & PO3

29	Materials for Turbines	T2	2	BB	L2	5	PO1							
Suggested Activity: Case studies given to the student														
Evaluation method: Evaluation of Case Studies														
Content Beyond the Syllabus Planned														
1	Striling & Ericsson Cycle													
Text Books														
1	Kothandaraman.C.P., Domkundwar. S,Domkundwar. A.V., “A course in thermal Engineering", Fifth Edition, ”Dhanpat Rai & so													
2	Rajput. R. K., “Thermal Engineering” S.Chand Publishers, 2017													
Reference Books														
1	Arora.C.P, ”Refrigeration and Air Conditioning ,” Tata McGraw-Hill Publishers 2008													
2	Ganesan V..” Internal Combustion Engines” , Third Edition, Tata Mcgraw-Hill 2012													
3	Ramalingam. K.K., "Thermal Engineering", SCITECH Publications (India) Pvt. Ltd., 2009.													
4	Rudramoorthy, R, “Thermal Engineering “,Tata McGraw-Hill, New Delhi,2003													
5	Sarkar, B.K,”Thermal Engineering” Tata McGraw-Hill Publishers, 2007													
Website / URL References														
1	<a href="https://nptel.ac.in/courses/112/103/112103262/">https://nptel.ac.in/courses/112/103/112103262/</a>													
2	<a href="https://nptel.ac.in/courses/112/103/112103275/">https://nptel.ac.in/courses/112/103/112103275/</a>													
Blooms Level														
Level 1 (L1) : Remembering		Lower Order Thinking	Fixed Hour Exa ms	Level 4 (L4) : Analysing					Higher Order Thinkin g	Projects / Mini Projects				
Level 2 (L2) : Understanding				Level 5 (L5) : Evaluating										
Level 3 (L3) : Applying				Level 6 (L6) : Creating										
Mapping syllabus with Bloom’s Taxonomy LOT and HOT														
Unit No	Unit Name	L1	L2	L3	L4	L5	L6	LOT	HOT	Total				
Unit 1	Gas And Steam Power Cycles		2	4				6	0	6				
Unit 2	Reciprocating Air Compressor		2	3				5	0	5				
Unit 3	Internal Combustion Engines And Combustion		7					7	0	7				
Unit 4	Internal Combustion Engine Performance And Systems	1	4	2				7	0	7				
Unit 5	Gas Turbines		1	3				4	0	4				
Total		1	16	12	0	0	0	29	0	29				
Total Percentage		3.448	55.17	41.3793	0	0	0	100	0	100				
CO PO Mapping														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO1 1	PO1 2	PSO1	PSO2
CO1	2	3	2										2	1
CO2	2	3	2										2	1
CO3	3												2	1
CO4	3	2					1						2	1

CO5	2	3	2									2	1
Avg	2.4	2.75	2									2	1
Justification for CO-PO mapping													
CO1	PO1: Basic engineering knowledge is required PO2: Problem analysis is required and PO3: Design of complex engineering is done												
CO2	PO1: Basic engineering knowledge is required PO2: Problem analysis is required and PO3: Design of complex engineering is done												
CO3	PO1: Basic engineering knowledge is required												
CO4	PO1: Basic engineering knowledge is required PO2: Problem analysis is required and PO7: Need to consider the impact on environment												
CO5	PO1: Basic engineering knowledge is required PO2: Problem analysis is required and PO3: Design of complex engineering is done												
3		High level			2		Moderate level			1		Low level	
Name & Sign of Faculty Incharge : VIGNESHWARAN													
Name & Sign of Subject Expert : Mr.Muhammed Irfan.A.A													
Head of the Department : Dr.S.Prasath													

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