

**GOVT. POLYTECHNIC, NAYAGARH**  
**LESSON PLAN**  
**4<sup>th</sup> SEMESTER MECHANICAL ENGINEERING (2023-24)**  
**SUBJECT- THERMAL ENGINEERING-II**  
(w.e.f 16/01/2024)

**TOTAL PERIOD-60**  
**THEORY-4P/WEEK**

**NAME OF FACULTY : PRAFULLA KUMAR MALLICK, Lect. (GF)**

SI No.	week	Day	Topics to be covered
1	1 <sup>st</sup>	1 <sup>st</sup> day	Introduction to I.C .Engine.
		2 <sup>nd</sup> day	Define Mechanical efficiency
		3 <sup>rd</sup> day	Indicated power, Indicated Thermal efficiency, Relative Efficiency
		4 <sup>th</sup> day	Brake power, Brake Thermal Efficiency
<b>SI No.</b>	<b>week</b>	<b>Day</b>	<b>Topics to be covered</b>
2	2 <sup>nd</sup>	1 <sup>st</sup> day	efficiency, overall efficiency
		2 <sup>nd</sup> day	Mean effective pressure& Specific fuel consumption
		3 <sup>rd</sup> day	Define air-fuel ratio , calorific value of fuel
		4 <sup>th</sup> day	Work out problems to determine efficiencies & specific fuel consumption
<b>SI No.</b>	<b>week</b>	<b>Day</b>	<b>Topics to be covered</b>
3	3 <sup>rd</sup>	1 <sup>st</sup> day	Air Compressor Explain functions and industrial use of air compressor
		2 <sup>nd</sup> day	Classify air compressor & principle of operation.
		3 <sup>rd</sup> day	Describe the parts and working principle of reciprocating Air compressor.
		4 <sup>th</sup> day	Its advantages , disadvantages & industrial use of compressor air
<b>SI No.</b>	<b>week</b>	<b>Day</b>	<b>Topics to be covered</b>
4	4 <sup>th</sup>	1 <sup>st</sup> day	Explain the terminology of reciprocating compressor such as bore, stroke,
		2 <sup>nd</sup> day	Pressure ratio free air delivered & Volumetric efficiency. etc
		3 <sup>rd</sup> day	Single stage and two stage compressor
		4 <sup>th</sup> day	Derive the work done of single stage with and without clearance.
<b>SI No.</b>	<b>week</b>	<b>Day</b>	<b>Topics to be covered</b>
5	5 <sup>th</sup>	1 <sup>st</sup> day	Derive the work done of two stage compressor with and without clearance.
		2 <sup>nd</sup> day	Solve simple problems (without clearance only)
		3 <sup>rd</sup> day	Solve simple problems (without clearance only)
		4 <sup>th</sup> day	Solve simple problems (without clearance only)
<b>SI No.</b>	<b>week</b>	<b>Day</b>	<b>Topics to be covered</b>
6	6 <sup>th</sup>	1 <sup>st</sup> day	Define steam? Difference between gas & vapours.
		2 <sup>nd</sup> day	Formation of steam.
		3 <sup>rd</sup> day	Representation on P-V, T-S, H-S, & T-H diagram.
		4 <sup>th</sup> day	Definition & Properties of Steam.
<b>SI No.</b>	<b>week</b>	<b>Day</b>	<b>Topics to be covered</b>

7	7 <sup>th</sup>	1 <sup>st</sup> day	Critical point ,phase change etc
		2 <sup>nd</sup> day	Use of steam table & mollier chart for finding unknown properties.
		3 <sup>rd</sup> day	Non flow & flow process of vapour.
		4 <sup>th</sup> day	P-V, T-S & H-S, diagram.
<b>Sl No.</b>	<b>week</b>	<b>Day</b>	<b>Topics to be covered</b>
8	8 <sup>th</sup>	1 <sup>st</sup> day	Determine the changes in properties & solve simple numerical.
		2 <sup>nd</sup> day	Determine the changes in properties & solve simple numerical.
		3 <sup>rd</sup> day	solve simple numerical.
		4 <sup>th</sup> day	solve simple numerical.
<b>Sl No.</b>	<b>week</b>	<b>Day</b>	<b>Topics to be covered</b>
9	9 <sup>th</sup>	1 <sup>st</sup> day	Steam Generator And its function
		2 <sup>nd</sup> day	Its advantages ,disadvantages and application of steam generator
		3 <sup>rd</sup> day	Classification & types of Boiler.
		4 <sup>th</sup> day	Important terms for Boiler.
<b>Sl No.</b>	<b>week</b>	<b>Day</b>	<b>Topics to be covered</b>
10	10 <sup>th</sup>	1 <sup>st</sup> day	Define tube & Water tube Boiler.
		2 <sup>nd</sup> day	Comparison between fire tube & Water tube Boiler.
		3 <sup>rd</sup> day	Description & working of common boilers (Cochran Boiler)
		4 <sup>th</sup> day	Description & working of common boilers (Lancashire Boiler)
<b>Sl No.</b>	<b>week</b>	<b>Day</b>	<b>Topics to be covered</b>
11	11 <sup>th</sup>	1 <sup>st</sup> day	Description & working of common boilers ( Babcock & Wilcox Boiler)
		2 <sup>nd</sup> day	Boiler Draught (Forced, induced & balanced)
		3 <sup>rd</sup> day	Boiler mountings & accessories
		4 <sup>th</sup> day	Boiler mountings & accessories
<b>Sl No.</b>	<b>week</b>	<b>Day</b>	<b>Topics to be covered</b>
12	12 <sup>th</sup>	1 <sup>st</sup> day	Steam Power Cycles And Carnot cycle with vapour.
		2 <sup>nd</sup> day	Derive work & efficiency of the cycle
		3 <sup>rd</sup> day	Rankine cycle
		4 <sup>th</sup> day	Representation in P-V, T-S & h-s diagram.
<b>Sl No.</b>	<b>week</b>	<b>Day</b>	<b>Topics to be covered</b>
13	13 <sup>th</sup>	1 <sup>st</sup> day	Derive Work & Efficiency.
		2 <sup>nd</sup> day	Effect of Various end conditions in Rankine cycle.
		3 <sup>rd</sup> day	Reheat cycle & regenerative Cycle.

		4 <sup>th</sup> day	Solve simple numerical on Carnot vapour Cycle & Rankine Cycle.
<b>Sl No.</b>	<b>week</b>	<b>Day</b>	<b>Topics to be covered</b>
14	14 <sup>th</sup>	1 <sup>st</sup> day	Define Heat Transfer , Modes of Heat Transfer(Conduction, Convection, Radiation).
		2 <sup>nd</sup> day	Fourier law of heat conduction and thermal conductivity (k).
		3 <sup>rd</sup> day	Newton's laws of cooling.
		4 <sup>th</sup> day	Radiation heat transfer (Stefan, Boltzmann & Kirchhoff's law) only statement, no derivation & no numerical problem.
<b>Sl No</b>	<b>week</b>	<b>Day</b>	<b>Topics to be covered</b>
15	15 <sup>th</sup>	1 <sup>st</sup> day	Black body Radiation
		2 <sup>nd</sup> day	Definition of Emissivity
		3 <sup>rd</sup> day	Define Absorptivity
		4 <sup>th</sup> day	Define transmissibility.

Pratula Kumar Malik  
Lecturer (GF)

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