

# LESSON PLAN

**SUB:** THERMAL ENGINEERING-II

**BRANCH:-** MECHANICAL ENGG.

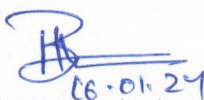
**SEMESTER:** 4<sup>th</sup>

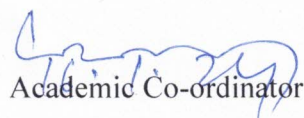
**NAME OF FACULTY:** ER. LITU BEHERA

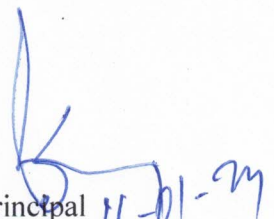


**GOVERNMENT POLYTECHNIC,  
BHADRAK**

**SESSION:2023-24**

  
Hod ,Mechanical  
16.01.24

  
Academic Co-ordinator

  
Principal  
Govt. Polytechnic, Bhadrak

<b>Discipline:</b> <b><u>MECHANICAL</u></b>	<b>Semester:</b> <b><u>4th</u></b>	<b>Name of the Teaching Faculty:</b> <b><u>ER. LITU BEHERA</u></b> <b><u>Lecturer Mechanical</u></b>
<b>Subject:</b> <b>THERMAL ENGINEERING- II</b>	<b>No. of days/per week class allotted:</b> <b>4</b>	<b>Semester From date: 16/01/2024</b> <b>To date:</b> <b>No of weeks: 15</b>
<b>Week</b>	<b>Class Day</b>	<b>Theory Topics:</b>
<b>1<sup>st</sup></b>	<b>1<sup>st</sup></b>	1. Performance of I.C engine 1.1 Define mechanical efficiency, Indicated thermal efficiency
	<b>2<sup>nd</sup></b>	Relative Efficiency, brake thermal efficiency overall efficiency
	<b>3<sup>rd</sup></b>	Mean effective pressure & specific fuel consumption.
	<b>4<sup>th</sup></b>	1.2 Define air-fuel ratio & calorific value of fuel.
<b>2<sup>nd</sup></b>	<b>1<sup>st</sup></b>	1.3 Work out problems to determine efficiencies & specific fuel consumption.
	<b>2<sup>nd</sup></b>	Revision of Chapter-1
	<b>3<sup>rd</sup></b>	Previous year question solutions
	<b>4<sup>th</sup></b>	Air Compressor
<b>3<sup>rd</sup></b>	<b>1<sup>st</sup></b>	2.1 Explain functions of compressor & industrial use of compressor air
	<b>2<sup>nd</sup></b>	2.2 Classify air compressor & principle of operation.
	<b>3<sup>rd</sup></b>	2.3 Describe the parts and working principle of reciprocating Air compressor.
	<b>4<sup>th</sup></b>	2.4 Explain the terminology of reciprocating compressor such as bore, stroke,
<b>4<sup>th</sup></b>	<b>1<sup>st</sup></b>	Pressure ratio free air delivered & volumetric efficiency.
	<b>2<sup>nd</sup></b>	2.4 Explain the terminology of reciprocating compressor such as bore, stroke, pressure ratio free air delivered & volumetric efficiency.
	<b>3<sup>rd</sup></b>	2.5 Derive the work done of single stage & two stage compressor with and without clearance.
	<b>4<sup>th</sup></b>	2.6 Solve simple problems (without clearance only)
<b>5<sup>th</sup></b>	<b>1<sup>st</sup></b>	Revision of Chapter-2
	<b>2<sup>nd</sup></b>	Previous year question solutions
	<b>3<sup>rd</sup></b>	Properties of Steam
	<b>4<sup>th</sup></b>	3.1 Difference between gas & vapours.

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6 <sup>th</sup>	1 <sup>st</sup>	3.2 Formation of steam.
	2 <sup>nd</sup>	3.3 Representation on P-V, T-S, H-S, & T-H diagram.
	3 <sup>rd</sup>	3.4 Definition & Properties of Steam.
	4 <sup>th</sup>	3.5 Use of steam table & mollier chart for finding unknown properties.
7 <sup>th</sup>	1 <sup>st</sup>	3.6 Non flow & flow process of vapour.
	2 <sup>nd</sup>	3.7 P-V, T-S & H-S, diagram.
	3 <sup>rd</sup>	3.8 Determine the changes in properties
	4 <sup>th</sup>	solve simple numerical.
8 <sup>th</sup>	1 <sup>st</sup>	Revision of Chapter-3
	2 <sup>nd</sup>	Previous year question solutions
	3 <sup>rd</sup>	Steam Generator
	4 <sup>th</sup>	4.1 Classification & types of Boiler.
9 <sup>th</sup>	1 <sup>st</sup>	4.2 Important terms for Boiler.
	2 <sup>nd</sup>	4.3 Comparison between fire tube & Water tube Boiler.
	3 <sup>rd</sup>	4.4 Description & working of common boilers (Cochran, Lancashire)
	4 <sup>th</sup>	4.4 Description & working of common boilers ( Babcock & Wilcox Boiler)
10 <sup>th</sup>	1 <sup>st</sup>	4.5 Boiler Draught (Forced, induced & balanced)
	2 <sup>nd</sup>	4.6 Boiler mountings & accessories
	3 <sup>rd</sup>	Revision of Chapter-4
	4 <sup>th</sup>	Previous year question solutions

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11 <sup>th</sup>	1 <sup>st</sup>	Steam Power Cycles 5.1 Carnot cycle with vapour.
	2 <sup>nd</sup>	5.2 Derive work & efficiency of the cycle.
	3 <sup>rd</sup>	5.3 Rankine cycle.
	4 <sup>th</sup>	5.3.1 Representation in P-V, T-S & h-s diagram.
12 <sup>th</sup>	1 <sup>st</sup>	5.3.2 Derive Work & Efficiency.
	2 <sup>nd</sup>	5.3.3 Effect of Various end conditions in Rankine cycle.
	3 <sup>rd</sup>	5.3.4 Reheat cycle & regenerative Cycle.
	4 <sup>th</sup>	5.4 Solve simple numerical on Carnot vapour Cycle.
13 <sup>th</sup>	1 <sup>st</sup>	5.4 Solve simple numerical on Rankine Cycle.
	2 <sup>nd</sup>	Revision of Chapter-5
	3 <sup>rd</sup>	Previous year question solutions
	4 <sup>th</sup>	6.1 Modes of Heat Transfer Conduction
14 <sup>th</sup>	1 <sup>st</sup>	6.1 Modes of Heat Transfer Convection
	2 <sup>nd</sup>	6.1 Modes of Heat Transfer Radiation
	3 <sup>rd</sup>	6.2 Fourier law of heat conduction and thermal conductivity (k).
	4 <sup>th</sup>	6.3 Newton's laws of cooling.
15 <sup>th</sup>	1 <sup>st</sup>	6.4 Radiation heat transfer (Stefan, Boltzmann & Kirchhoff's law) only statement, no derivation & no numerical problem.
	2 <sup>nd</sup>	6.5 Black body Radiation, Definition of Emissivity, absorptivity, & transmissibility.
	3 <sup>rd</sup>	Revision of Chapter-6
	4 <sup>th</sup>	Previous year question solutions

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U. Behera  
14/1/24