

LESSON PLAN

SUB: TE-II

BRANCH:- MECHANICAL ENGG.

SEMESTER: 4TH


NAME OF FACULTY: ER.SAGAR KUMAR BEHERA

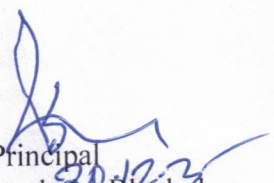


**GOVERNMENT POLYTECHNIC,
BHADRAK**

SESSION:2025-26


Hod ,Mechanical


Academic Co-ordinator

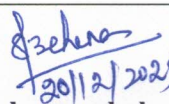

Principal
Govt. Polytechnic, Bhadrak

Discipline: MECHANICAL	Semester :4 th	Name of the Teaching Faculty Sagar kumar behera Lecturer (Stage-II), Mechanical Engineering
Subject: Thermal Engineering-II (TH:2)	No. of days/perweek class allotted: 3	Semester From date: 22/12/2025 To date:18-04-26 No of weeks: 15
Week	Class Day	Theory Topics:
1 st	1 st	Air-standard Brayton cycle; Description with p-v and T-S diagrams
	2 nd	Gas turbines Classification: open cycle gas turbines and closed cycle gas turbines;
	3 rd	comparison of gas turbine with reciprocating I.C. engines and steam turbines.
2 nd	1 st	Applications and limitations of gas turbines
	2 nd	General lay-out of Open cycle constant pressure gas turbine; P-V and T-S diagrams and working;
	3 rd	General lay-out of Closed cycle gas turbine; P-V and T-S diagrams and working.
3 rd	1 st	Principle of jet propulsion; Fuels used for jet propulsion;
	2 nd	Applications of jet propulsion; Working of a turbojet engine
	3 rd	Principle of Ram effect; Working of a Ram jet engine
4 th	1 st	Principle of Rocket propulsion; Working principle of a rocket engine
	2 nd	Applications of rocket propulsion; Comparison of jet and rocket propulsions.
	3 rd	Formation of steam under constant pressure; Industrial uses of steam;
5 th	1 st	Basic definitions: saturated liquid line, saturated vapor line, liquid region, vapor region, wet region, superheat region, critical point, saturated liquid, saturated vapor
	2 nd	Basic definitions: saturation temperature, sensible heat, latent heat, wet steam, dryness fraction, wetness fraction
	3 rd	Basic definitions: 2saturated steam, superheated steam, degree of superheat; Determination of enthalpy, internal energy, internal latent heat
	1 st	entropy of wet, dry and superheated steam at a given pressure using steam tables and Mollier chart for the following processes: Isochoric process, Isobaric process,

6th		Hyperbolic process.
	2nd	Isothermal process, Isentropic process, Throttling process, Polytropic process;
	3rd	Simple direct problems on the above using tables and charts
7th	1st	Steam calorimeters: Separating, throttling, Combined Separating and throttling calorimeters
	2nd	Simple direct problems .
	3rd	Function and use of steam boilers; Classification of steam boilers with examples
8th	1st	Brief explanation with line sketches of Cochran, Babcock and Wilcox Boilers;
	2nd	Comparison of water tube and fire tube boilers; Description with line sketches and working of modern high pressure boilers Lamont and Benson boilers;
	3rd	Boiler mountings: Pressure gauge, water level indicator, fusible plug, blow down cock, stop valve, safety valve, (dead weight type, spring loaded type, high pressure and low water safety alarm)
9th	1st	Boiler accessories: feed pump, economizer, super heater and air preheater; Study of steam traps & separators;
	2nd	Explanation of the terms: Actual evaporation, equivalent evaporation factor of evaporation, boiler horse power and boiler efficiency
	3rd	Formula for the above terms without proof; Simple direct problems the above
10th	1st	Draught systems (Natural, forced & induced)
	2nd	Flow of steam through nozzle; Velocity of steam at the exit of nozzle in terms of heat drop using analytical method
	3rd	Flow of steam through nozzle; Velocity of steam at the exit of nozzle in terms of heat drop using Mollier chart
11th	1st	Discharge of steam through nozzles
	2nd	Critical pressure ratio

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12 th	1 st	Effect of friction in nozzles
	2 nd	Super saturated flow in nozzles;
	3 rd	Working steam jet injector
13 th	1 st	Simple numerical problems.
	2 nd	Simple numerical problems.
	3 rd	Classification of steam turbines with examples; Difference between impulse & reaction turbines
14 th	1 st	Principle of working of a simple De-lavel turbine with line diagrams- Velocity diagrams
	2 nd	Expression for work done, axial thrust, tangential thrust, blade and diagram efficiency, stage efficiency, nozzle efficiency
	3 rd	Methods of reducing rotor speed; compounding for velocity, for pressure or both pressure and velocity
15 th	1 st	Working principle with line diagram of a Parson's Reaction turbine- velocity diagrams; Simple problems on single stage impulse turbines (without blade friction) and reaction turbine including data on blade height.
	2 nd	Bleeding, re-heating and re-heating factors(Problems omitted); Governing of steam turbines: Throttle, By-pass & Nozzle control governing.
	3 rd	PYQ solving


 20/12/2025
Sagar kumar behera
Lecturer (Stage-II)