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 :4th	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:
1st	1st	Air-standard Brayton cycle; Description with p-v and T-S diagrams
	2nd	Gas turbines Classification: open cycle gas turbines and closed cycle gas turbines;
	3rd	comparison of gas turbine with reciprocating I.C. engines and steam turbines.
2nd	1st	Applications and limitations of gas turbines
	2nd	General lay-out of Open cycle constant pressure gas turbine; P-V and T-S diagrams and working;
	3rd	General lay-out of Closed cycle gas turbine; P-V and T-S diagrams and working.
3rd	1st	Principle of jet propulsion; Fuels used for jet propulsion;
	2nd	Applications of jet propulsion; Working of a turbojet engine
	3rd	Principle of Ram effect; Working of a Ram jet engine
4th	1st	Principle of Rocket propulsion; Working principle of a rocket engine
	2nd	Applications of rocket propulsion; Comparison of jet and rocket propulsions.
	3rd	Formation of steam under constant pressure; Industrial uses of steam;
5th	1st	Basic definitions: saturated liquid line, saturated vapor line, liquid region, vapor region, wet region, superheat region, critical point, saturated liquid, saturated vapor
	2nd	Basic definitions: saturation temperature, sensible heat, latent heat, wet steam, dryness fraction, wetness fraction
	3rd	Basic definitions: 2saturated steam, superheated steam, degree of superheat; Determination of enthalpy, internal energy, internal latent heat
	1st	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 evaporatio 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 nozzl terms of heat drop using analytical method
	3rd	Flow of steam through nozzle; Velocity of steam at the exit of nozz in terms of heat drop using Mollier chart
11th	1st	Discharge of steam through nozzles
	2nd	Critical pressure ratio

12th	1st	Effect of friction in nozzles
	2nd	Super saturated flow in nozzles;
	3rd	Working steam jet injector
13th	1st	Simple numerical problems.
	2nd	Simple numerical problems.
	3rd	Classification of steam turbines with examples; Difference between impulse & reaction turbines
14th	1st	Principle of working of a simple De-lavel turbine with line diagrams- Velocity diagrams
	2nd	Expression for work done, axial thrust, tangential thrust, blade and diagram efficiency, stage efficiency, nozzle efficiency
	3rd	Methods of reducing rotor speed; compounding for velocity, for pressure or both pressure and velocity
15th	1st	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.
	2nd	Bleeding, re-heating and re-heating factors(Problems omitted); Governing of steam turbines: Throttle, By-pass & Nozzle control governing.
	3rd	PYQ solving

S.Behera
20/12/2025

Sagar kumar behera

Lecturer (Stage-II)