Lesson Plan for,THERMAL ENGINEERING-II, (TH:2) , 4th Semester,Mechanical Engg. (SUMMER-2026)		
Discipline: Mechanical Engg	**Semester:**4TH	**Name of the Teaching Faculty:** Sri B. SHIVA SANKAR ACHARY(GF),Mechanical
SUBJECT:TH:2-THERMAL ENGINEERING-II	No. of Days/ week class allotted=3	**Semester Starts from** 22.12.2025

WEEK	PERIOD	TOPICS TO BE COVERED
		Unit-I: INTRODUCTION
1	1	Air-standard Brayton cycle; Description with p-v and T-S diagrams; Gas turbines Classification
	2	open cycle gas turbines and closed cycle gas turbines; comparison of gas turbine with reciprocating I.C. engines and steam turbines
	3	Applications and limitations of gas turbines; General lay-out of Open cycle constant pressure gas turbine P-V and T-S diagrams and working.
2	4	General lay-out of Closed cycle gas turbine; P-V and T-S diagrams and working
	5	Jet Propulsion: Principle of jet propulsion
	6	Fuels used for jet propulsion; Applications of jet propulsion; Working of a turbojet engine
3	7	Principle of Ram effect; Working of a Ram jet engin
	8	Principle of Rocket propulsion
	9	Working principle of a rocket engine
4	10	Applications of rocket propulsion; Comparison of jet and rocket propulsions
		Unit-II: Properties of Steam
	11	Formation of steam under constant pressure; Industrial uses of steam
	12	Basic definitions: saturated liquid line, saturated vapor line, liquid region, vapor region, wet region, superheat region, critical point, saturated liquid, saturated vapor, saturation temperature
5	13	sensible heat, latent heat, wet steam, dryness fraction, wetness fraction, saturated steam
	14	superheated steam, degree of superheat
	15	Determination of enthalpy, internal energy, internal latent heat, 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, Hyperbolic process, Isothermal process, Isentropic process, Throttling process, Polytropic process
6	16	Determination of enthalpy, internal energy, internal latent heat, 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, Hyperbolic process, Isothermal process, Isentropic process, Throttling process, Polytropic process
	17	Simple direct problems on the above using tables and charts
	18	Simple direct problems on the above using tables and charts
7	19	Steam calorimeters: Separating, throttling, Combined Separating and throttling calorimeter
	20	Problems on above chapter.

		Unit-III: Steam Generators
	21	Function and use of steam boilers; Classification of steam boilers with examples
8	22	Brief explanation with line sketches of Cochran, Babcock and Wilcox Boiler
	23	Comparison of water tube and fire tube boilers; Description with line sketches and working of modern high pressure boilers Lamont and Benson boilers
	24	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
9	25	Boiler accessories: feed pump, economizer, super heater and air preheater
	26	Study of steam traps & separators; Explanation of the terms: Actual evaporation, equivalent evaporation, factor of evaporation, boiler horse power and boiler efficiency
	27	Formula for the above terms without proof; Simple direct problems on the above
10	28	Draught systems (Natural, forced & induced
		Unit-IV: Steam Nozzles
	29	Flow of steam through nozzle
	30	Velocity of steam at the exit of nozzle in terms of heat drop using analytical method and Mollier chart
11	31	Velocity of steam at the exit of nozzle in terms of heat drop using analytical method and Mollier chart
	32	Discharge of steam through nozzles; Critical pressure ratio
	33	Discharge of steam through nozzles; Critical pressure ratio
12	34	Methods of calculation of crosssectional areas at throat and exit for maxi- mum discharge
	35	Effect of friction in nozzles and Super saturated flow in nozzles
	36	Working steam jet injector
13	37	Simple numerical problems
	38	Simple numerical problems
		Unit-V: Steam Turbines
	39	Classification of steam turbines with examples; Difference between impulse & reaction turbines
14	40	Principle of working of a simple De-lavel turbine with line diagrams- Velocity diagrams; Expression for work done
	41	axial thrust, tangential thrust, blade and diagram efficiency, stage efficiency, nozzle efficiency; Methods of reducing rotor speed
	42	compounding for velocity, for pressure or both pressure and velocity
15	43	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
	44	Bleeding, re-heating and re-heating factors
	45	Governing ofsteam turbines: Throttle, By-pass & Nozzle control governing.
16	46	Revision
	47	Revision
	48	Revision

HOD 22/12/2025

B. Shiva Sankar Acharya
Concerned faculty 22/12/2025

Govt. Polytechnic Kandhamal