Name of the Institute:	R.K. INSTITUTE OF ENGG. & TECH.
Department:	Mechanical Engineering
Semester:	4th SEM.
Subject Name with code:	ThermalEngineering-II (Th-2)
Total No. of Class (Required):	45 | FROM-22/12/2025 TO-18/04/2026
Faculty Name:	Mr. ANANDA KUMAR DAS

Class No.	Brief Description of the Topic/Chapter to be taught	Remarks
1	Air-standard Brayton cycle	
2	Description with p-v and T-S diagrams	
3	Gas turbines Classification: open cycle gas turbines and closed cycle gas turbines; comparison of gas turbine with reciprocating I.C.	
4	engines and steam turbines. Applications and limitations of gas turbines; General lay-out of Open cycle constant pressure gas turbine;	
5	P-V and T-S diagrams and working; General lay-out of Closed cycle gas turbine; P-V and T-S diagrams and working.	
6	Principle of jet propulsion; Fuels used for jet propulsion; Applications of jet propulsion;	
7	Working of a turbojet engine; Principle of Ram effect; Working of a Ram jet engine;	
8	Principle of Rocket propulsion;	
9	Working principle of a rocket engine;	
10	Applications of rocket propulsion; Comparison of jet and rocket propulsions.	
11	Properties of Steam: Formation of steam under constant pressure;	
12	Industrial uses of steam; Basic definitions: saturated liquid line, saturated vapor line	
13	liquid region, vapor region, wet region, superheat region, critical point, saturated liquid	
14	saturated vapor, saturation temperature, sensible heat, latent heat, wet steam	
15	dryness fraction, wetness fraction, saturated steam, superheated steam, degree of superheat;	
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:	
17	Isochoric process, Isobaric process, Hyperbolic process, Isothermal process, Isentropic process	
18	Throttling process, Polytropic process; Simple direct problems on the above using tables and charts;	
19	Steam calorimeters: Separating, throttling, Combined Separating and throttling calorimeters	
20	problems.	

21	Steam Generators: Function and use of steam boilers; Classification of steam boilers with examples;	
22	Brief explanation with line sketches of Cochran, Babcock and Wilcox Boilers; Comparison of water tube and fire tube boilers;	
23	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);	
25	Boiler accessories: feed pump, economizer, super heater and air preheater; Study of steam traps & separators;	
26	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;	
28	Draught systems (Natural, forced & induced).	
29	Steam Nozzles: 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;	
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;	
34	Methods of calculation of cross sectional areas at throat and exit for maximum discharge;	
35	Methods of calculation of cross sectional areas at throat and exit for maximum discharge;	
36	Effect of friction in nozzles and Super saturated flow in nozzles;	
37	Working steam jet injector;	
38	Simple numerical problems.	
39	Steam Turbines: Classification of steam turbines with examples; Difference between impulse & reaction turbines;	
40	Principle of working of a simple De-lavel turbine with line diagrams-Velocity diagrams;	
41	Expression for work done, axial thrust, tangential thrust, blade and diagram efficiency, stage efficiency, nozzle efficiency;	
42	Methods of reducing rotor speed; compounding for velocity, for pressure or both pressure and velocity;	
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(Problems omitted); Governing of steam turbines:	
45	Throttle, By-pass & Nozzle control governing.	

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