

C. V. RAMAN POLYTECHNIC, BHUBANESWAR
LESSON PLAN
Session (2025-2026)

Discipline: Mechanical Engineering	Semester: 4 th Semester, Summer/2026	Name of the Faculty: Sutapa Sarkar, Asst. Prof.
		Email ID: sutapa.sarkar@cvrp.edu.in
Subject: Thermal Engineering – II , MEPC204 TH:2	No. of Days/week: 03	Start Date: 22.12.2025
		End Date: 18.04.2026
Week	Class Day	Theory Topics
1st	1st	Unit-1 Gas Turbine: Air standard Brayton cycle; Description with P-V and T-S diagrams;
	2nd	Classification of gas turbines (open cycle gas turbine and closed cycle gas turbine);
	3rd	Comparison of Gas turbine & Reciprocating I.C. engines and steam turbine;
2nd	1st	Application and limitations of gas turbines;
	2nd	Lay-out of open cycle constant pressure gas turbine; P-V and T-S diagrams and working principles;
	3rd	Lay-out of closed cycle constant pressure gas turbine; P-V and T-S diagrams and working principles;
3rd	1st	Jet Propulsion: Principles of jet propulsion; Fuels used for jet propulsion; Application of jet propulsion;
	2nd	Working of a turbojet engine; Principles of Ram effect;
	3rd	Working of a Ram jet engine; Principles and Working of a Rocket propulsion;
4th	1st	Principles of a Rocket engine; Application of Rocket propulsion; Comparison of jet and rocket propulsion.
	2nd	Unit-2 Properties of Steam: Formation of steam under constant pressure; Industrial uses of steam;
	3rd	Basic definition of : saturated liquid line, saturated vapor line, Vapor region, wet region, superheat region, critical point.
5th	1st	Basic definition of: saturated liquid, saturated vapor, saturation temperature.
	2nd	Basic definition of: sensible heat, latent heat, wet steam, dryness fraction, wetness fraction.
	3rd	saturated steam, superheated steam, degree of superheat;

6th	1st	Determination of enthalpy, internal energy, internal latent heat.
	2nd	Entropy of wet, dry and superheated steam at a given pressure using steam table and Mollier chart for given process (Isochoric process, Isobaric process, Hyperbolic process) & solving problems.
	3rd	Entropy of wet, dry and superheated steam at a given pressure using steam table and Mollier chart for given process (Isothermal process, Isentropic process) & solving problems.
7th	1st	Entropy of wet, dry and superheated steam at a given pressure using steam table and Mollier chart for given process (Throttling process, Polytropic process) & solving problems.
	2nd	Steam calorie meters; Separating, throttling, combined separating and throttling calorie meters related problems.
	3rd	Unit- 3 Steam Generators: Function, use & classification of steam boilers.
8th	1st	Explanation of Cochran, Babcock & Wilcox boilers.
	2nd	Comparison of water tube & fire tube boilers; Working of modern pressure boilers Lamont and Benson boilers.
	3rd	Boiler mountings: pressure gauge, water level indicator, fusible plug, blow down cock, stop valve, safety valve.
9th	1st	Boiler accessories: feed pump, economizer, super heater and air pre heater.
	2nd	Study of steam traps and separators;
	3rd	Explanation of actual evaporation, equivalent evaporation factor of evaporation, boiler horse power and boiler efficiency.
10th	1st	Formula for above terms and related to problems; Draught system.
	2nd	Unit- 4 Steam Nozzles: Flow of steam through nozzles; velocity of steam at the exit of nozzle in terms of heat drop using analytical method.
	3rd	Flow of steam through nozzles; velocity of steam at the exit of nozzle in terms of heat drop using Mollier chart.
11th	1st	Flow of steam through nozzles; velocity of steam at the exit of nozzle in terms of heat drop using analytical method.
	2nd	Flow of steam through nozzles; velocity of steam at the exit of nozzle in terms of heat drop using analytical method.
	3rd	Discharge of steam through nozzles; Critical pressure ratio.

12th	1st	Methods of calculation of cross-sectional areas at throat and exit for maximum discharge.
	2nd	Effect of friction in nozzles and super saturated flow in nozzles.
	3rd	Working of steam injector.
13th	1st	Solve simple problems.
	2nd	Solve simple problems.
	3rd	Unit-5 Steam Turbines: Classification of steam turbines
14th	1st	Difference between impulse & reaction turbines; Principle of working of a delaval turbine with line diagram. .
	2nd	Velocity diagram; Expression for work done, axial thrust, tangential thrust.
	3rd	Blade and diagram efficiency, stage efficiency, nozzle efficiency.
15th	1st	Working principle of a Parson's reaction turbine- velocity diagram.
	2nd	Simple problems on single stage impulse turbine
	3rd	Governing of steam turbines; Throttle, By-pass & nozzle control governing.

Sulata Sen
Concerned Faculty

B. D. D.
H.O.D.