

GOVERNMENT POLYTECHNIC SONEPUR
DEPARTMENT OF MECHANICAL ENGINEERING



LESSON PLAN

FACULTY: Er PRABIR KUMAR SWAIN

SUBJECT: THERMAL ENGINEERING-II(TH-2)

ACADEMIC SESSION:2025-26(S)

SEMESTER & SECTION: 4TH


H.O.D (Mechanical)

Govt. Polytechnic, Sonepur

Discipline: Mechanical Engg.	Semester:4 th		Name of the Teaching Faculty: PRABIR KUMAR SWAIN Designation: Lecturer S-II(MECHANICAL)
Subject: Thermal engineering-ii (Th.2)	No. of days/week class allotted:03 (TUE, WED, FRI)		Semester From date: 22.12.2025 To date: 18.04.2026 No. of weeks: 17 Total class: 44
Week	Class Day		Theory Topics
1 ST	23.12.2025	1 st	Introduction to thermal engineering and syllabus discussion
	24.12.2025	2 nd	Gas Turbines: Air-standard Brayton cycle; Description with p-v and T-S diagrams
	26.12.2025	3 rd	Gas turbines Classification: open cycle gas turbines and closed cycle gas turbines; comparison of gas turbine with reciprocating I.C. engines and steam turbines.
2 ND	30.12.2025	1 st	Applications and limitations of gas turbines; General lay-out of Open cycle constant pressure gas turbine; P-V and T-S diagrams and working
	31.12.2025	2 nd	General lay-out of Closed cycle gas turbine; P-V and T-S diagrams and working.
	02.01.2026	3 rd	Principle of jet propulsion; Fuels used for jet propulsion; Applications of jet propulsion
3 RD	06.01.2026	1 st	Working of a turbojet engine; Principle of Ram effect; W
	07.01.2026	2 nd	Principle of Rocket propulsion; Working principle of a rocket engine
	09.01.2026	3 rd	Applications of rocket propulsion; Comparison of jet and rocket propulsions.
4 TH	13.01.2026	1 st	Properties of Steam: Formation of steam under constant pressure; Industrial uses of steam; Basic definitions: saturated liquid line, saturated vapor line, liquid region, vapor region, wet region, superheat region, critical point, saturated liquid,

			saturated vapor, saturation temperature, sensible heat, latent heat
	16.01.2026	2 nd	wet steam, dryness fraction, wetness fraction, saturated steam, superheated steam, degree of superheat; Determination of enthalpy, internal energy, internal latent heat, entropy of wet, dry and superheated steam at a given pressure using steam tables
5 TH	20.01.2026	1 st	Mollier chart for the following processes: Isochoric process, Isobaric process, Hyperbolic process, Isothermal process, Isentropic process, Throttling process, Polytropic process
	21.01.2026	2 nd	Simple direct problems on the above using tables and charts
6 TH	27.01.2026	1 st	Simple direct problems on the above using tables and charts;
	28.01.2026	2 nd	Simple direct problems on the above using tables and charts;
	30.01.2026	3 rd	Steam calorimeters: Separating, throttling
7 TH	03.02.2026	1 st	Combined Separating and throttling calorimeters – problems
	04.02.2026	2 nd	calorimeters – problems
	06.02.2026	3 rd	Class test-1
8 TH	10.02.2026	1 st	Class test-2
	11.02.2026	2 nd	Steam Generators: Function and use of steam boilers; Classification of steam boilers with examples; Brief explanation with line sketches of Cochran
	13.02.2026	3 rd	Babcock and Wilcox Boilers;

9 th	17.02.2026	1 st	Comparison of water tube and fire tube boilers; Description with line sketches and working of modern high pressure boilers Lamont
	18.02.2026	2 nd	Benson boilers;
	20.02.2026	3 rd	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);
10 th	24.02.2026	1 st	Boiler accessories: feed pump, economizer, super heater and air preheater
	25.02.2026	2 nd	Study of steam traps & separators; Explanation of the terms: Actual evaporation, equivalent evaporation, factor of evaporation, boiler horse power and boiler efficiency;
	27.02.2026	3 rd	Formula for the above terms without proof; Simple direct problems on the above
11 th	06.03.2026	1 st	Draught systems (Natural, forced & induced).
12 th	10.03.2026	1 st	Draught systems (Natural, forced & induced).
	11.03.2026	2 nd	Steam Nozzles: Flow of steam through nozzle; Velocity of steam at the exit of nozzle in terms of heat drop using analytical method
	13.03.2026	3 rd	Mollier chart; Discharge of steam through nozzles; Critical pressure ratio
13 th	17.03.2026	1 st	Methods of calculation of cross-sectional areas at throat and exit for maximum discharge
	18.03.2026	2 nd	Effect of friction in nozzles and Super saturated flow in nozzles;
	20.03.2026	3 rd	Working steam jet injector

14 th	24.03.2026	1 st	Simple numerical problems.
	25.03.2026	2 nd	Steam Turbines: Classification of steam turbines with examples; Difference between impulse & reaction turbines
15 th	31.03.2026	1 st	Principle of working of a simple De-level turbine with line diagrams- Velocity diagrams
16 th	07.04.2026	1 st	Expression for work done, axial thrust, tangential thrust, blade and diagram efficiency, stage efficiency, nozzle efficiency;
	08.04.2026	2 nd	Methods of reducing rotor speed; compounding for velocity, for pressure or both pressure and velocity;
	10.04.2026	3 rd	Working principle with line diagram of a Parson's Reaction turbine-velocity diagrams;
17 th	15.04.2026	1 st	Simple problems on single stage impulse turbines (without blade friction) and reaction turbine including data on blade height.
	17.04.2026	2 nd	Bleeding, re-heating and re-heating factors(Problems omitted),Governing of steam turbines: Throttle, By-pass & Nozzle control governing.
18	21.04.2026	1 st	revision
TOTAL NO OF CLASS-44			

Prepared By: *Prabir Kumar Swain* 20/12/25

Prabir kumar swain
Lecturer stage-ii(Mechanical)
Govt. Polytechnic,Sonepur

Checked by

Prabir Kumar Swain
H.O.D.

Dept. of Mech. Engg.
Govt. Polytechnic,Sonepur

Approved by

Sas
20/12/25

Academic Coordinator
Govt. Polytechnic,Sonepur