

"PVC" NSSK GOVT POLYTECHNIC BILASPUR
PLANNED THEORY SYLLABUS COVERAGE

Department: Mechanical Engg.				Subject: THERMAL ENGINEERING-II		
Sem. & Branch: 4th / Mech. Engg.				Duration: 3 Year		
Teacher: Sumit Sharma						
Syllabus coverage		Total periods:-56				
SR. NO	Period no	Topic/Unit	Details	Instruction Reference	Additional study	Remarks
1	1-7	Gas Turbines	Air-standard Brayton cycle; Brief description along with derivation of efficiency of Air standard Brayton Cycle with P-V and T-S diagrams, Gas turbines Classification: open cycle gas turbines and closed cycle gas turbines; comparison of gas turbine with reciprocating I.C. engines and steam turbines. Applications and limitations of gas turbines; General layout of Open cycle constant pressure gas turbine; P-V and T-S diagrams and working; General layout of Closed cycle gas turbine; P-V and T-S diagrams and working.	1. Thermal Engineering-R.K. Rajput, Laxmi Publication NewDelhi	1. A Course in Thermal Engineering-S. Domkundwar & C.P.Kothandaraman, Dhanpat Rai & Publication, New Delhi 2. Thermal Engineering-P.L.Ballaney,Khanna Publishers 3. Heat Engineering in MKS and SI Units-V.P.Vasandani &D.S. Kumar, Metropolitan Book Co. Pvt. Ltd,NewDelhi.	
2	8-14	Jet Propulsion	Principle of jet propulsion; Fuels used for jet propulsion; Applications of jet propulsion; Working of a turbo jet engine; Principle of Ram effect; Working of a Ramjet engine; Principle of Rocket propulsion; Working principle of a rocket engine; Applications of rocket propulsion; Comparison of jet and rocket propulsions.			
3	15-24	Properties of Steam	Formation of steam under constant pressure; Industrial uses of steam; Basic definitions: saturated liquid line, saturated vapour line, liquid region, vapour region, wet region, super heat region, critical point, saturated liquid, saturated vapour, saturation temperature, sensible heat, latent heat, wet steam, dryness fraction, wetness fraction, saturated steam, superheated steam, degree of superheat; Determination of enthalpy, volume and entropy of wet, dry and super heated steam using steam tables and Mollier chart, Throttling process, Simple direct problems on the above using steam tables and Mollier charts			
4	25-36	Steam Generators	Function and use of steam boilers; Classification of steam boilers with examples; Brief explanation with line sketches of Cochran, Babcock and Wilcox Boilers; Comparison of water tube and fire tube boilers; Description with line sketches and working of modern high pressure boilers Lamont and Benson boilers; Boiler mountings: Pressure gauge, water level indicator, fusible plug, blow down cock, stop valve, safety valve, (dead weight type, spring loaded type); Boiler accessories: economizer, super heater and air pre-heater; Study of steam traps & separators; Concept of the terms: Actual evaporation, equivalent evaporation, factor of evaporation, boiler horse power and boiler efficiency; Formula for the above terms without proof; Simple direct problems on the above terms.			
5	37-46	Steam Nozzles	Type of steam nozzles; Flow of steam through nozzle; Velocity of steam at the exit of nozzle in terms of heat drop using analytical method; Simple direct problems on the above only using analytical method, Discharge of steam through nozzles; Critical pressure ratio; Methods of calculation of cross sectional areas at throat and exit for maximum discharge.			
6	47-56	Steam Turbines	Classification of steam turbines with examples; Difference between impulse & reaction turbines; Principle of working of a simple De-lavel turbine with line diagrams- Velocity diagrams (Diagrammatic representation only); Methods of reducing rotor speed; compounding for velocity, for pressure or both pressure and velocity; Working principle with line diagram of a Parson's Reaction turbine-velocity diagrams(Diagrammatic representation only);Bleeding, re-heating and re-heating factors; Governing of steam turbines: Throttle, By-pass & Nozzle control governing.			

Sumit Sharma
Sr. Lecturer,
Mechanical Engg.

Approved

27/01/24

Sign HOD/IOC

(Signature)