

PNS SCHOOL OF ENGINEERING & TECHNOLOGY
Department of mechanical Engineering

LESSON PLAN

Session :: Winter – 2025

Semester date::14/07/25 to 15/11/25

Semester/Branch :: 5Th Semester, Mechanical Engineering

Subject (with code) ::Hydraulic Machines & Industrial Fluid Power
(Th.3)

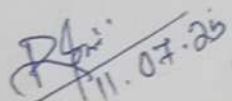
Contact hours/week :: 4

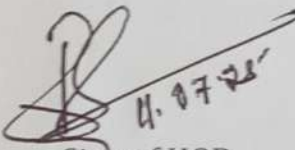
Name of Faculty :: Ramakant swain/Subarna Singh


week	class	topic
1 st	1	Syllabus discussion.
	2	Introduction to hydraulic machine
	3	Hydro-electric power plant Layout
	4	classification of hydraulic turbine.
2 nd	1	Construction and working of impulse turbine (Pelton wheel)
	2	Velocity triangle diagram, work done and efficiencies of Pelton turbine
	3	Problem solving on Pelton turbine
	4	Construction and working principle of Francis turbine
3 rd	1	Velocity diagram, work done and efficiencies of Francis turbine
	2	Problems on Francis' turbine
	3	Construction and working principle of Kaplan turbine
	4	Velocity diagram, work done and efficiencies of Kaplan turbine
4 th	1	Problems on Kaplan turbine

	2	Difference between impulse and reaction turbine
	3	Draught tube and its function
	4	Quiz test / Assignment
5 th	1	Introduction to Centrifugal pump, Construction and working principle of centrifugal pump
	2	Velocity triangle diagram, work done and efficiencies of Centrifugal pump
	3	Numerical on Centrifugal pump
	4	Introduction to reciprocating pump, Classification. Application. Working Principle
6 th	1	Construction and working principle of single acting reciprocating pump
	2	Construction and working principle of double acting reciprocating pump.
	3	discharge and Power required for the single & double acting reciprocating pump
	4	Define Slip, positive and negative slip, Relation between slip and coefficient of discharge
7 th	1	Numerical on reciprocating pump
	2	Numerical on reciprocating pump
	3	Numerical on reciprocating pump
	4	Introduction to Industrial fluid power and its application and limitation
8 th	1	Components of Pneumatic system: Air Filter, Air regulator and Air lubricator
	2	Pressure control valves: construction and working of pressure relief valve, pressure reducing valve
	3	construction and working of Unloading valve, sequence valve
	4	direction control valves: symbolic representation of DCV
9 th	1	Construction and working of 3/2 DCV, 5/2 DCV
	2	Construction and working of 5/3 DCV, Throttle valve
	3	Construction and working of Flow control valves
	4	ISO Symbols of pneumatic components
10 th	1	Direct control of single acting cylinder, double acting cylinder
	2	metering in and metering out pneumatic control circuit
	3	Introduction to hydraulic control system advantages and its application
	4	Components of hydraulic control system
11 th	1	Hydraulic accumulators
	2	Pressure control valves: construction and working of pressure relief valve, pressure reducing valve

	3	construction and working of Unloading valve, sequence valve
	4	Construction and working of 3/2 DCV, 5/2 DCV
12 th	1	Construction and working of 5/3 DCV, Throttle valve
	2	Introduction to Fluid power pumps, Working principle and uses of Gear Pumps
	3	Working of Vane Pump, Radial piston pumps
	4	Different types of hydraulic actuators, Function, types and working Working
13 th	1	Operation and control of single acting cylinder and double acting cylinder
	2	Working of Metering in and Metering out hydraulic circuits
	3	Comparison of hydraulic and pneumatic systems
	4	Quizz test/Assignments
14 th	1	Revision of hydraulic turbines and previous year question discussion
	2	Practice problems on turbines
	3	Revision of hydraulic pumps and previous year question discussion
	4	Practice problems on pumps
15 th	1	Revision of hydraulic control system and previous year question discussion
	2	Revision of FCV, DCV, pressure control valve
	3	Revision of pneumatic control system and previous year question discussion
	4	Revision of fluid power pump, meter in meter out ciircuit


 11.07.25
 Sign. Of Lecturer


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