UtkalmaniGopabandhu Institute of engineering, Rourkela
Department of mechanical Engineering

LESSON PLAN

Session :: Winter – 2024

Semester date::01/07/24 to 08/11/24

Course Type :: Theory

Semester/Branch :: 5Th Semester, Mechanical Engineering

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

Contact hours/week :: 4

Name of Faculty :: Kalebar Singh

week	class	topic
1st	1	Lesson plan, Syllabus importance and Course Outcomes, pattern of Internal assessment,classtest Introduction to hydraulicmachine.
	2	Hydro-electric power plantLayout and classification of hydraulic trbine
2nd	1	Construction and workingof impulse turbine(Pelton wheel)
	2	Velocity tringle diagram, work done andefficiencies of Pelton turbine
	3	Problem solving on Peltonturbine
	4	Construction and workingprinciple of Francis turbine
3rd	1	Velocity diagram, work done andefficiencies of Francis turbine
	2	Problems on Francis'sturbine
	3	Construction and working principle of Kaplan turbine
	4	Velocity diagram, work done andefficiencies of Kaplan turbine
4th	1	Problems on Kaplanturbine
	2	Difference between impulse and reaction trbine
	3	Drat tube and its function

	4	Quiz test /Assignment
5th	**1**	Introduction to Centrifugal pump, Construction and workingprinciple of centrifugal pump
	2	Velocity triangle diagram, work done andefficiencies of Centrifugal pump
	3	Numerical on Centrifugal pump
	4	Introduction to reciprocating pump, Classification. Application.Working Principle
6th	**1**	Construction and workingprinciple of single actingreciprocating pump
	2	Construction and workingprinciple of double actingreciprocating pump.
	3	discharge and Power required for the single & double acting reciprocating pump
	4	Define Slip, positive and negativeslip, Relation between slip andcoefficient of discharge
7TH	**1**	Numerical on reciprocating pump
	2	Numerical on reciprocating pump
	3	Class test-1(Unit 1,2,3)/Assignment
	4	Introduction to Industrial fluid power and its application and limitation
8th	**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
9th	**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
10th	**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
11th	**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
12th	**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
13th	**1**	Operation and control of single acting cylinder and double acting cylinder
	2	Working of Metering in andMetering out hydraulic circuits
	3	Comparison of hydraulic andpneumatic systems
	4	Quizz test/Assignments
14th	**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
15th	**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
16th	**1**	Class test-2(Unit-4,5)
	2	extraDoubt solving class

LEARNING RESOURCES

SL.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER
01	DR.JAGDISH LAL	HYDRAULIC MACHINES	METROPOLITAN BOOK CO
02	ANDREW	HYDRAULICS	
03	K SHANMUGA, SUNDARAM	HYDRAULIC &PNEUMATIC CONTROL	S.CHAND
04	MAJUMDAR	HYDRAULIC &PNEUMATIC CONTROL	TMH
05	J.F. BLACKBURN, G.REETHOF &J.L SHEARER	FLUID POWER CONTROL	