

LESSON PLAN

Discipline :	Semester:	Name of the Teaching Faculty:
Mechanical	5th	Suprava Behera
Subject:	No. Of Days/Week	Semester From Date: 15.09.2022 To Date: 22.12.2022
Hydraulic Machines & Industrial Fluid Power	Class Allotted	No. Of Weeks: 15 <i>Extended upto 21.01.23</i>
Week	Class Day	Theory/Practical Topics
1st	1st	Introduction to hydraulic machine and definition.
	2nd	Classification of hydraulic turbine.
	3rd	Construction and working principle of Impulse turbine
	4th	Velocity diagram of moving blades, work done and efficiencies of Impulse turbine
2nd	1st	Numerical for Impulse turbine
	2nd	Construction and working principle of Francis turbine
	3rd	Velocity diagram of moving blades, work done and efficiencies of Francis turbine
	4th	Numerical for Francis turbine
3rd	1st	Construction and working principle of Kaplan turbine
	2nd	Velocity diagram of moving blades, work done and efficiencies of Kaplan turbine
	3rd	Numerical for Kaplan turbine
	4th	Difference between Impulse and Reaction turbine
4th	1st	Numerical for Impulse turbine, Francis turbine, Kaplan turbine
	2nd	Review class
	3rd	Assignment Evaluation / Class Test
	4th	Construction and working principle of centrifugal pump.
5th	1st	Velocity diagram of moving blades, work done and various efficiencies of Centrifugal pump
	2nd	Numerical for Centrifugal pump
	3rd	Construction and working principle of single acting reciprocating pump.
	4th	Construction and working principle of double acting reciprocating pump.
6th	1st	Derivation of power required for the single acting reciprocating pump.

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	2nd	Derivation of power required for the double acting reciprocating pump.
	3rd	Define Slip, positive and negative slip, Relation between slip and coefficient of discharge .Numerical on above
		Review class
7th	1st	Assignment Evaluation & Class Test
	2nd	Basic Concept of Pneumatic systems and its application.
	3rd	Elements of Pneumatic system: Air Filter, Air regulator and Air lubricator
	4th	Pressure control valves :Pressure relief valves
8th	1st	Pressure control valves :Pressure regulation valves
	2nd	Direction control valves: nomenclature and classification
	3rd	Direction control valves: operating method and symbolic representation.
	4th	Direction control valves: operation of 3/2DCV,5/2 DCV,5/3DCV
9th	1st	Direction control valves: flow control valves
	2nd	Direction control valves: Throttle valves
	3rd	ISO symbols for pneumatic Components
	4th	Pneumatic circuit – direct Control of single acting cylinder
10th	1st	Pneumatic circuit – Operation of double acting cylinder
	2nd	Operation of double acting cylinder with metering in and metering out control
	3rd	Review class
	4th	Assignment Evaluation /Class Test
11th	1st	Hydraulic control system, its merit and demerit
	2nd	Hydraulic Accumulators: Pressure control valve
	3rd	Hydraulic Accumulators: Pressure relief valve
	4th	Hydraulic Accumulators: Pressure regulation valve
12th	1st	Direction control valve: 3/2 DCV, 5/2 DCV. 5/3 DCV
	2nd	Direction control valve: Flow control valves
	3rd	Direction control valve: Throttle valves
	4th	Gear Pumps – Working principle and their uses. External and Internal gear pumps.
13th	1st	Vane pump – Working principle and their uses.
	2nd	Radial piston pump – Working principle and their uses.
	3rd	ISO symbols for hydraulic components
	4th	Actuators: Function, types, Working of Actuators
14th	1st	Hydraulic circuit – Control of single acting cylinder

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	2nd	Hydraulic circuit – Operation of double acting cylinder
	3rd	Operation of double acting cylinder with Metering in and Metering out control
	4th	Comparison of hydraulic and pneumatic system
15 th	1st	Review class
	2nd	Assignment Evaluation /Class Test
	3rd	Previous year Exam Question discussion
	4th	Possible Question and Answer Discussion

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, GREETHOF & J.L. SHEARER	FLUID POWER CONTROL	

S. Behra
15.09.22
(Lect. - C.Mech)

Signature of the Faculty