GOVERNMENT POLYTECHNIC, KORAPUT

DEPARTMENT OF MECHANICAL ENGINEERING

Discipline: **MECHANICAL ENGG**	Semester: **5TH**	Name of the Teaching Faculty: A. SUDHIR KUMAR
Subject: **HYDRAULIC MACHINES &INDUSTRIAL FLUID POWER**	No. of days/per week class allotted: 04	Semester From date: 01/9/20 To Date: 19/3/21. No. of Weeks: 15
COURSE OUTCOMES	CO 1. The working principle of pumps and turbines CO 2. The working of centrifugal pumps and gear pumps. CO 3. Compare pneumatic system with hydraulic system. CO 4. Draw pneumatic circuits for industrial application. CO 5. State the properties of hydraulic system. CO6. Develop hydraulic circuit for machine tool operation.	

WEEK	CLASS DAY	THEORY TOPIC
1ST	1	**1.HYDRAULIC TURBINES** Definition and classification of hydraulic turbines
	2	To be continued…
	3	Construction and working principle of impulse turbine
	4	To be continued…
2ND	1	Velocity diagram of moving blades, work done and derivation of various efficiencies of impulse turbine
	2	To be continued…
	3	Velocity diagram of moving blades, work done and derivation of various efficiencies of Francis turbine
	4	To be continued…
3RD	1	Velocity diagram of moving blades, work done and derivation of various efficiencies of Kaplan turbine
	2	To be continued…
	3	Numerical on above
	4	To be continued…
4TH	1	Distinguish between impulse turbine and reaction turbine.
	2	**QUIZ & ASSIGNMENT-I**
	3	**2.CENTRIFUGAL PUMPS** Construction and working principle of centrifugal pumps
	4	Work done and derivation of various efficiencies of centrifugal pumps.
5TH	1	To be continued…
	2	Numerical on above
	3	**3.RECIPROCATING PUMPS** Describe construction & working of single acting reciprocating pump
	4	Describe construction & working of double acting reciprocating pump
6TH	1	Derive the formula for power required to drive the pump (Single acting & double acting)
	2	To be continued…
	3	Define slip. State positive & negative slip & establish relation between slip & coefficient of discharge.
	4	**QUIZ & ASSIGNMENT-II**
7TH	1	**4.PNEUMATIC CONTROL SYSTEM** Elements –filter-regulator-lubrication unit
	2	Pressure control valves

	3	Pressure relief valves Pressure regulation valves
	4	Direction control valves
8TH	1	3/2DCV, 5/2 DCV, 5/3DCV
	2	Flow control valves
	3	Throttle valves
	4	ISO Symbols of pneumatic components
9TH	1	To be continued…
	2	Pneumatic circuits
	3	Direct control of single acting cylinder
	4	Operation of double acting cylinder
10TH	1	To be continued…
	2	Operation of double acting cylinder with metering in and metering out control
	3	To be continued…
	4	**QUIZ & ASSIGNMENT-II**
11TH	1	**5.HYDRAULIC CONTROL SYSTEM** Hydraulic system, its merit and demerits
	2	Hydraulic accumulators
	3	Pressure control valves
	4	Pressure relief valves
12TH	1	Pressure regulation valves
	2	Direction control valves (Hydraulics)
	3	3/2DCV,5/2 DCV,5/3DCV
	4	Flow control valves
13TH	1	Throttle valves
	2	Fluid power pumps
	3	External and internal gear pumps Vane pump Radial piston pumps
	4	ISO Symbols for hydraulic components
14TH	1	**QUIZ & ASSIGNMENT-III**
	2	Actuators
	3	Hydraulic circuits
	4	Direct control of single acting cylinder
15TH	1	Operation of double acting cylinder
	2	Operation of double acting cylinder with metering in and metering out control
	3	Comparison of hydraulic and pneumatic system
	4	REVISION Class

RNING RESOURCES:

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

WEBSITE RESOURCES:

https://youtu.be/8xd7cWvMrvE

A. Sreedhar Kumar

Sign. Of Faculty concerned

Shareenila Labar

Sign. Of HOD I/C

Principal, GP Koraput