Orissa School of Mining EngineeringKeonjhar

Department of Mechanical Engineering

Lesson Plan w.e.f 01.10.2021- 18.01.2022

Subject: **HYDRAULIC MACHINES AND INDUSTRIAL FLUID POWER (TH-3)**			
Discipline: **Mechanical Engineering**		Name of the Faculty: **Bibhabaree Samal**	
Course Code:	**TH-3**	Semester:	**5th**
Total Periods:	**60**	Examination:	**2021(Winter)**
Theory Periods:	4P/W	Class Test:	20
Maximum Marks:	**100**	End Semester Examination:	80

Week	Class Day	Theory Topics
1st	1st	**Module 1 HYDRAULIC TURBINES**: Introduction
	2nd	Definition and classification of hydraulic turbines
	3rd	Construction and working principle of impulse turbine.
	4th	Velocity diagram of moving blades, work done
2nd	1st	Derivation of various efficiencies of impulse turbine.
	2nd	Numerical of impulse turbine
	3rd	Francis turbine :construction
	4th	Velocity diagram of moving blades, work done and derivation of various efficiencies of Francis turbine
3rd	1st	Numerical of Francis turbine
	2nd	Kaplan turbine: Construction ,description
	3rd	Velocity diagram of moving blades, work done and derivation of various efficiencies
	4th	Distinguish between impulse turbine and reaction turbine.
4th	1st	Numerical of turbines
	2nd	**Module 2 CENTRIFUGAL PUMPS: Introduction**
	3rd	Construction and working principle of centrifugal pumps
	4th	work done derivation of centrifugal pump
5th	1st	Derivation of various efficiencies of centrifugal pumps.
	2nd	Numerical of centrifugal pumps
	3rd	**Module 3 RECIPROCATING PUMPS: Introduction**
	4th	Describe construction & working of single acting reciprocating pump.
6th	1st	Describe construction & working of double acting reciprocating pump
	2nd	Derivation of the formula foe power required to drive the pump (Single acting & double acting)
	3rd	Slip, positive & negative slip & establish relation between slip & coefficient of discharge
	4th	numerical on above
7th	1st	**Module 4 PNEUMATIC CONTROL SYSTEM: Introduction**
	2nd	Elements –filter-regulator-lubrication unit
	3rd	Pressure control valves
	4th	Pressure relief valves

8th	1st	Pressure regulation valves
	2nd	Direction control valves 3/2DCV
	3rd	Direction control valves :5/2 DCV,5/3DCV
	4th	Flow control valves
9th	1st	Throttle valves
	2nd	ISO Symbols of pneumatic components
	3rd	ISO Symbols of pneumatic components
	4th	Pneumatic circuits
10th	1st	Direct control of single acting cylinder
	2nd	Operation of double acting cylinder
	3rd	Operation of double acting cylinder with metering in and metering out control
	4th	**Module 5. HYDRAULIC CONTROL SYSTEM:Introduction**
11th	1st	Hydraulic system, its merit and demerits
	2nd	Hydraulic accumulators
	3rd	Pressure control valves
	4th	Pressure relief valves
12th	1st	Pressure regulation valves
	2nd	Direction control valves 3/2DCV,5/2 DCV,5/3DCV
	3rd	Flow control valves
	4th	Throttle valves
13th	1st	Fluid power pumps: External and internal gear pumps
	2nd	Vane pump
	3rd	Radial piston pumps
	4th	ISO Symbols for hydraulic components.
14th	1st	Actuators: Single acting and double acting actuators
	2nd	Hydraulic circuits of Direct control of single acting cylinder
	3rd	Hydraulic circuits of Operation of double acting cylinder
	4th	Operation of double acting cylinder with metering in and metering out control
15th	1st	Comparison of hydraulic and pneumatic system
	2nd	Revision
	3rd	Revision
	4th	Revision