

## LESSON PLAN

<b>Discipline:</b> Mech. Engg.	<b>Semester:</b> Fifth (5 <sup>th</sup> )	<b>Name of the Faculty:</b> Er Pushpak Kumar Nath
<b>Subject:</b> Hydraulic Machine and Industrial Fluid Power	<b>No. of days/week class allotted:</b> Five (5)	<b>Semester from Date:</b> 15.09.22 <b>to Date:</b> 22.12.22 <b>No. of Weeks:</b> 15
<b>WEEK</b>	<b>CLASS DAY</b>	<b>THEORY TOPICS</b>
1 <sup>st</sup>	1 <sup>st</sup>	Introduction to the subject
	2 <sup>nd</sup>	Definition and classification of hydraulic turbines
	3 <sup>rd</sup>	Construction of impulse turbine
	4 <sup>th</sup>	Working principle of impulse turbine
	5 <sup>th</sup>	Velocity diagram of moving blades impulse turbine.
2 <sup>nd</sup>	1 <sup>st</sup>	Work done and derivation of various efficiencies of impulse.
	2 <sup>nd</sup>	Numerical on above
	3 <sup>rd</sup>	Velocity diagram of moving blades Francis turbine.
	4 <sup>th</sup>	Work done and derivation of various efficiencies of Francis turbine.
	5 <sup>th</sup>	Numerical on above
3 <sup>rd</sup>	1 <sup>st</sup>	Velocity diagram of moving blades Kaplan turbine
	2 <sup>nd</sup>	work done and derivation of various efficiencies of Kaplan turbine
	3 <sup>rd</sup>	Numerical on above
	4 <sup>th</sup>	Distinguish between impulse turbine and reaction turbine
	5 <sup>th</sup>	Review class
4 <sup>th</sup>	1 <sup>st</sup>	Monthly Test -01
	2 <sup>nd</sup>	Construction of centrifugal pumps
	3 <sup>rd</sup>	Working principle of centrifugal pumps

	4 <sup>th</sup>	work done and derivation of various efficiencies of centrifugal pump
	5 <sup>th</sup>	Numerical on above
5 <sup>th</sup>	1 <sup>st</sup>	Numerical on above
	2 <sup>nd</sup>	Review class
	3 <sup>rd</sup>	construction of single acting reciprocating pump
	4 <sup>th</sup>	working of single acting reciprocating pump
	5 <sup>th</sup>	Numerical on above
6 <sup>th</sup>	1 <sup>st</sup>	construction of double acting reciprocating pump.
	2 <sup>nd</sup>	working of double acting reciprocating pump.
	3 <sup>rd</sup>	Numerical on above
	4 <sup>th</sup>	formula for power required to drive the pump (Single acting & double acting)
	5 <sup>th</sup>	Define slip. State positive & negative slip establish relation between slip & coefficient of discharge
7 <sup>th</sup>	1 <sup>st</sup>	Numerical on above
	2 <sup>nd</sup>	Numerical on above
	3 <sup>rd</sup>	Review class
	4 <sup>th</sup>	Monthly Test -02
	5 <sup>th</sup>	Elements –Filter-Regulator-Lubrication Unit
8 <sup>th</sup>	1 <sup>st</sup>	Pressure control valves Pressure relief valves
	2 <sup>nd</sup>	Pressure regulation valves
	3 <sup>rd</sup>	Direction control valves
	4 <sup>th</sup>	3/2DCV,5/2 DCV,5/3DCV
	5 <sup>th</sup>	Flow control valves
9 <sup>th</sup>	1 <sup>st</sup>	Throttle valves
	2 <sup>nd</sup>	ISO Symbols of pneumatic components
	3 <sup>rd</sup>	continue

	4 <sup>th</sup>	Direct control of single acting cylinder
	5 <sup>th</sup>	Operation of double acting cylinder
10 <sup>th</sup>	1 <sup>st</sup>	Operation of double acting cylinder with metering in and metering out control
	2 <sup>nd</sup>	Review class
	3 <sup>rd</sup>	Monthly Test -03
	4 <sup>th</sup>	Hydraulic system, its merit and demerits
	5 <sup>th</sup>	Hydraulic accumulators
11 <sup>th</sup>	1 <sup>st</sup>	Pressure control valves
	2 <sup>nd</sup>	Pressure relief valves
	3 <sup>rd</sup>	Pressure regulation valves
	4 <sup>th</sup>	Direction control valves
	5 <sup>th</sup>	3/2DCV,5/2 DCV,5/3DCV
12 <sup>th</sup>	1 <sup>st</sup>	Flow control valves
	2 <sup>nd</sup>	Throttle valves
	3 <sup>rd</sup>	Fluid power pumps
	4 <sup>th</sup>	Vane pump
	5 <sup>th</sup>	Radial piston pumps
13 <sup>th</sup>	1 <sup>st</sup>	ISO Symbols for hydraulic components.
	2 <sup>nd</sup>	Actuators
	3 <sup>rd</sup>	Hydraulic circuits
	4 <sup>th</sup>	continue
	5 <sup>th</sup>	Direct control of single acting cylinder
14 <sup>th</sup>	1 <sup>st</sup>	Operation of double acting cylinder
	2 <sup>nd</sup>	Operation of double acting cylinder with metering in control
	3 <sup>rd</sup>	Operation of double acting cylinder with metering out control
	4 <sup>th</sup>	Comparison of hydraulic and pneumatic system

	5 <sup>th</sup>	Monthly Test -04
15 <sup>th</sup>	1 <sup>st</sup>	Review class
	2 <sup>nd</sup>	Review class
	3 <sup>rd</sup>	Review class
	4 <sup>th</sup>	Review class
	5 <sup>th</sup>	Review class