

KIIT POLYTECHNIC
Department of Mechanical Engineering

LESSON PLAN

Session	::	Winter – 2022
Course Type	::	Theory
Semester/Branch	::	5 th Semester, Mechanical Engineering
Subject (with code)	::	Hydraulic Machines & Industrial Fluid Power (Th.3)
Contact hours/week	::	4
Name of Faculty	::	Prasant Kumar Patra

SL. No.	CLASS ID	COURSE CONTENT	MODE OF DELIVERY	EXHIBIT/ REFERENCE
1	1	Introduction to hydraulic machine. What is hydraulic turbine? How hydraulic turbine works?	Lecture (Model)	1. Study Material 2. Fluid Mechanics & Hydraulic Machines by R.K. Bansal (Book)
2	2	Hydro-electric power plant Layout	Lecture (Explanation)	1. Study Material 2. Fluid Mechanics & Hydraulic Machines by R.K. Bansal (Book)
3	3	Classification of hydraulic turbine.	Lecture (Explanation)	1. Study Material 2. Fluid Mechanics & Hydraulic Machines by R.K. Bansal (Book)
4	4	Construction and working principle of impulse turbine (Pelton wheel)	Lecture (Explanation)	1. Study Material 2. Fluid Mechanics & Hydraulic Machines by R.K. Bansal (Book)
5	5	Velocity diagram of moving blades, work done and efficiencies of Pelton turbine	Lecture (Explanation)	https://youtu.be/UMz5GR7Nhqg?list=PLq7jO-L_k0yVmqNL4XVB9vOJ47_ysGYWn
6	6	Problem solving on Pelton turbine	Problem based Learning	Fluid Mechanics & Hydraulic Machines by R.K. Bansal (Book)
7	7	Construction and working principle of Francis turbine	Lecture (Explanation)	1. Study Material 2. Fluid Mechanics & Hydraulic Machines by R.K. Bansal (Book)
8	8	Velocity diagram of moving blades, work done and efficiencies of Francis turbine	Lecture (Explanation)	https://youtu.be/1eYcjdGrXYA?list=PLq7jO-L_k0yVmqNL4XVB9vOJ47_ysGYWn https://www.youtube.com/watch?v=BFoJOZbZ9FI&list=PLq7jO-L_k0yVmqNL4XVB9vOJ47_ysGYWn&index=13
9	9	Problem solving on Francis's turbine	Problem based Learning	Fluid Mechanics & Hydraulic Machines by R.K. Bansal (Book)
10	10	Construction and working principle of Kaplan turbine	Lecture (Explanation)	1. Study Material 2. Fluid Mechanics & Hydraulic Machines by R.K. Bansal (Book) https://youtu.be/TyygDiQPzaA?list=PLq7jO-L_k0yVmqNL4XVB9vOJ47_ysGYWn

11	11	Velocity diagram of moving blades, work done and efficiencies of Kaplan turbine	Lecture (Explanation)	1. Study Material 2. Fluid Mechanics & Hydraulic Machines by R.K. Bansal (Book)
12	12	Problem solving on Kaplan turbine	Problem based Learning	Fluid Mechanics & Hydraulic Machines by R.K. Bansal (Book)
13	13	Difference between Impulse and Reaction turbine	Flipped Class	https://youtu.be/RcdA2tGts_E?list=PLq7jO-L_k0yVmqNL4XVB9vOJ47_ysGYWn
14	14	Draft tube: Function & types, Governing of turbine	Video Content	https://youtu.be/HWX06fwSJWM?list=PLq7jO-L_k0yVmqNL4XVB9vOJ47_ysGYWn
15	15	Revision	Recap/Summarize	
16	16	Class Test/Assignment		
17	17	What is Centrifugal pump? Construction and working principle of centrifugal pump.	Video Content	1. Study Material 2. Fluid Mechanics & Hydraulic Machines by R.K. Bansal (Book)
18	18	Velocity diagram of moving blades, work done and efficiencies of Centrifugal pump	Lecture (Explanation)	https://youtu.be/S7eGRy7zlj4?list=PLq7jO-L_k0yVmqNL4XVB9vOJ47_ysGYWn
19	19	Numerical for Centrifugal pump	Problem based Learning	https://youtu.be/5KgIDLs4rGg?list=PLq7jO-L_k0yVmqNL4XVB9vOJ47_ysGYWn https://youtu.be/dPYq8Nj0awo?list=PLq7jO-L_k0yVmqNL4XVB9vOJ47_ysGYWn
20	20	Revision	Recap/Summarize	
21	21	What is reciprocating pump? Classification. Application. Working Principle	Video Content	1. Study Material 2. Fluid Mechanics & Hydraulic Machines by R.K. Bansal (Book)
22	22	Construction and working principle of single acting reciprocating pump.	Lecture (Explanation)	https://youtu.be/H1AsPLYCyWk?list=PLq7jO-L_k0yVmqNL4XVB9vOJ47_ysGYWn
23	23	Construction and working principle of double acting reciprocating pump.	Lecture (Explanation)	https://youtu.be/aiH_hwb8Ceg?list=PLq7jO-L_k0yVmqNL4XVB9vOJ47_ysGYWn
24	24	Determination of discharge and Power required for the pump (single & double acting).	Lecture (Explanation)	https://youtu.be/-JRCoPWHkU?list=PLq7jO-L_k0yVmqNL4XVB9vOJ47_ysGYWn
25	25	Define Slip, positive and negative slip, Relation between slip and coefficient of discharge	Lecture (Explanation)	1. Study Material 2. Fluid Mechanics & Hydraulic Machines by R.K. Bansal (Book)
26	26	Revision	Recap/Summarize	
27	27	Class Test/Assignment		
28	28	What is Hydraulic and Pneumatic system?	Video Content	https://youtu.be/8xd7cWvMrvE?list=PLbMVogVj5nJTKwm1WjltrAEZrLE995Ja
29	29	Elements of Pneumatic system: Air Filter, Air regulator and Air lubricator	Lecture (Explanation)	Study Material
30	30	Different types of valve-1	Video Content	https://youtu.be/2_g1Fntx4o?list=PLbMVogVj5nJTKwm1WjltrAEZrLE995Ja

31	31	Different types of valve-2	Video Content	https://youtu.be/EWPVrljCgpk?list=PLbMVogVj5nJTKwm1WjlutrAEZrLE995Ja
32	32	ISO symbols for pneumatic circuits	Lecture (Explanation)	https://youtu.be/yx3DzindtXU?list=PLbMVogVj5nJTKwm1WjlutrAEZrLE995Ja
33	33	What is Pneumatic circuit? Components and uses	Lecture (Explanation)	Study Material
34	34	Pneumatic circuit – Control of single and double acting cylinder	Lecture (Explanation)	Study Material
35	35	Operation of double acting cylinder with Metering in and Metering out control	Lecture (Explanation)	Study Material
36	36	Revision	Recap/Summarize	
37	37	Class test		
38	38	Hydraulic system, its merit and demerit	Lecture (Explanation)	Study Material
39	39	Hydraulic Accumulators	Video Content	https://youtu.be/gruZTqln1eY?list=PLbMVogVj5nJTKwm1WjlutrAEZrLE995Ja
40	40	Different types of valve-1	Video Content	https://youtu.be/2_g1Fntx4o?list=PLbMVogVj5nJTKwm1WjlutrAEZrLE995Ja
41	41	ISO symbols for hydraulic components; circuits	Video Content	https://youtu.be/yx3DzindtXU?list=PLbMVogVj5nJTKwm1WjlutrAEZrLE995Ja
42	42	Working principle and uses of Gear Pumps, Vane pump & Radial piston pump.	Video Content	https://youtu.be/3YQVPFpXHQQ?list=PLbMVogVj5nJTKwm1WjlutrAEZrLE995Ja
43	43			
44	44	Actuators: Function, types, Working of Actuator	Lecture (Explanation)	Study Material
45	45	Operation of double acting cylinder with Metering in and Metering out control	Lecture (Explanation)	Study Material
46	46	Comparison of hydraulic and pneumatic systems	Lecture (Explanation)	Study Material
47	47	Class Test/Assignment		
48	48	Revision	Recap/Summarize	

Signature of Concern Teacher