

### Lesson Plan

**Name of Faculty** : Sh. Sunny Brar  
**Dicipline** : 4th Sem. Mechanical Engg.  
**Subject** : HPS  
**Lesson Plan duration** : 15 Weeks  
**Work load (Lecture/Practical) per week (in hours):** 3L and 4P

Week	Theory		Teacher sign	Practical		Teacher sign
	Lecture day	Topic(Including assignment/test)		Practical Day	Topic	
	1	<b>UNIT I Properties of fluid</b> : Density, Specific gravity, Specific Weight, Specific Volume, Dynamic Viscosity, Kinematic Viscosity, Surface tension, Capillarity			1(a) Measurement of pressure head by employing Piezometer tube	
	2	Vapour Pressure, Compressibility. Fluid Pressure & Pressure Measurement: Fluid pressure, of Pascal's law and its applications			1(b) Measurement of pressure head by employing Simple U-tube manometer	
	3	Pressure head, Pressure intensity, Concept of vacuum and gauge pressures, atmospheric pressure, absolute pressure			1(c) Measurement of pressure head by employing Bourdon.s tube pressure gauge	
2	4	Piezometer, Simple U- tube Manometer and differential manometers, Bourdan's pressure gauge			2. Verification of Bernoulli's theorem.	
	5	Concept of Total pressure on immersed bodies, center of pressure				
	6	Simple problems on fluid properties and Manometers.				
3	7	<b>UNIT II Fluid Flow</b> : Types of fluid flows, Path line and Stream line			3. Determination of Coefficient of Discharge of venturimeter	
	8	Continuity equation, Bernoulli's theorem				
	9	Principle of operation of Venturimeter				
4	10	Principle of Orifice meter and Pitot tube			4. Determination of Coefficient of Discharge, coefficient of contraction and coefficient of velocity of Orifice meter	
	11	Derivations for discharge, coefficient of discharge and numerical problems				
	12	<b>Flow Through Pipes:</b> Laminar and turbulent flows; Darcy's equation and Chezy's equation for frictional losses				
5	13	Minor losses in pipes, wetted perimeter, Hydraulic gradient and total gradient line			5. To find coefficient of friction for a pipe (Darcy's equation).	
	14	Reynold's number and its effect on pipe friction				
	15	<b>Sessional-I</b>				
6	16	Water hammer. Simple numerical problems to estimate major and minor losses			6. Determination of minor losses of flow through pipes. (Chezy's Equation)	
	17	<b>UNIT III Hydraulic Turbines:</b> Impact of jet on fixed vertical and moving vertical flat plates,				
	18	<b>PTM</b>				

7	19	Hydraulic Turbines: Classification of hydraulic turbines			7.To determine overall efficiency of a single stage centrifugal pump	
	20	Selection of turbine on the basis of head and discharge available				
	21	Construction and working principle of Pelton wheel				
		Construction and working principle of Francis turbine				
	22	Construction and working principle of Kaplan turbine			8. Demo of working of Pelton wheel, Francis and Kaplan turbine with the help of working	
	23	Applications of hydraulic press				
	24	Hydraulic jack				
9	25	Hydraulic accumulator			9. Draw hydraulic circuit of any available machine or working mode	
	26	Hydraulic ram				
	27	<b>UNIT IV Pumps:</b> Centrifugal Pumps: Principle of working and applications				
10	28	<b>Sessional-II</b>			10. . Draw pneumatic circuit of any available machine or working model	
	29	Types of casings and impellers				
	30	Concept of multistage, Priming and its methods				
11	31	Cavitation, Manometric head, Work done, Manometric efficiency, Overall efficiency			Revision	
	32	<b>Reciprocating Pumps:</b> Construction, working principle				
	33	<b>PTM</b>				
12	34	Applications of single and double acting reciprocating pumps				
	35	Concept of Slip, Negative slip				
	36	Cavitation and separation				
13	37	<b>UNIT V Hydraulic and Pneumatic systems :</b> Introduction to oil power hydraulic and pneumatic system			Revision	
	38	<b>Assignment-III</b>				
	39	Relative Merits and Demerits of oil power hydraulic and pneumatic system				
	40	Basic components of hydraulic system, function of each component in a hydraulic circuit such as Oil reservoirs, connectors, pipes, motors and pumps(power pack), Filters, etc				
	41	<b>Components of Pneumatic Systems :</b> Basic components				
	42	Function of each component such as Air compressors, Air cylinder and their types (single acting, double acting, piston type, diaphragm type, tandem cylinder, double ended cylinder)				
15	43	Common faults in hydraulic system			Revision	
	45	Common faults pneumatic systems and remedial action				
16	46	Revision			Revision	
	47	Revision				
	48	Revision				