NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)

LESSON PLAN

SUBJECT: Th-3 (HYDRAULICS & PNEUMATIC CONTROL)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
1	Fluid Mechanics	8	8
2	Hydro dynamics	10	10
3	Hydraulic devices	14	14
4	Basic Components of Hydraulic & Pneumatic System	10	10
5	5 Accessories of hydraulic & Pneumatic Circuit	8	8
6	Hydro Pneumatic System & Circuits	10	10
	Total Period:	60	66

Discipline: AUTOMOBILE ENGINEERING	Semester: 4th	**Name of the Teaching Faculty:** Er.BISHNU CHARAN JENA
Week	**Class Day**	**Theory / Practical Topics**
1st	**1st**	Define fluid, description of fluid properties like Density, Specific weight, specific gravity,
	2nd	specific volume , Dynamic viscosity, kinematic viscosity, surface tension Capillary phenomenon. Solve simple numerical.
	3rd	specific volume , Dynamic viscosity, kinematic viscosity, surface tension Capillary phenomenon. Solve simple numerical.
	4th	Measurement of pressure
	5th	Concept of atmospheric pressure, gauge pressure, absolute pressure, pressure gauges- Piezometer tube
2nd	**1st**	Concept of atmospheric pressure, gauge pressure, absolute pressure, pressure gauges- Piezometer tube
	2nd	simple & differential monometer, MicroManometer (simple problems on manometers) Bourdon tube pressure gauge
	3rd	simple & differential monometer, MicroManometer (simple problems on manometers) Bourdon tube pressure gauge
	4th	Law of continuity and its application
	5th	Bernoulli's Theorem
3rd	**1st**	Energy possessed by the liquid in motion, Bernoulli's theorem and its applications
	2nd	Energy possessed by the liquid in motion, Bernoulli's theorem and its applications
	3rd	such as venturimeter, orifice meter &pitot tube (Analytical treatment with derivation for measurement of discharge is expected)
	4th	Hydraulic Coefficients

	5th	Concept of vena contract. Coefficient of contraction
4th	**1st**	coefficient of velocity, coefficient of discharge, relation between the hydraulic coefficients.
	2nd	coefficient of velocity, coefficient of discharge, relation between the hydraulic coefficients.
	3rd	Types of fluid flow
	4th	Steady, unsteady, rotational, irrotational, laminar, turbulent, one, two & three dimensional flow, uniform & non uniform flow
	5th	Steady, unsteady, rotational, irrotational, laminar, turbulent, one, two & three dimensional flow, uniform & non uniform flow
5th	**1st**	Simple Hydraulic devices. Working principles, construction and applications of hydraulic jack, hydraulic Ram, hydraulic lift, hydraulic press
	2nd	Simple Hydraulic devices. Working principles, construction and applications of hydraulic jack, hydraulic Ram, hydraulic lift, hydraulic press
	3rd	Centrifugal Pumps
	4th	Types, construction & working of centrifugal pump. Types of casing. Need of priming, Heads
	5th	Types, construction & working of centrifugal pump. Types of casing. Need of priming, Heads
6th	**1st**	Losses & efficiencies of centrifugal pump (NO analytical treatment). Net positive suction head, fault finding &remedies, pump selection
	2nd	Losses & efficiencies of centrifugal pump (NO analytical treatment). Net positive suction head, fault finding &remedies, pump selection
	3rd	Reciprocating Pumps
	4th	Constriction and working of single & double acting reciprocating pump, positive & negative slip

	5th	Constriction and working of single & double acting reciprocating pump, positive & negative slip
7th	**1st**	Air vessels- their function & advantages.
	2nd	Power & efficiencies of reciprocating pump. Reasons of cavitations & separation
	3rd	Power & efficiencies of reciprocating pump. Reasons of cavitations & separation
	4th	Power & efficiencies of reciprocating pump. Reasons of cavitations & separation
	5th	Basic components of Hydraulic & Pneumatic systems.
8th	**1st**	Hydraulic & Pneumatic system components
	2nd	Hydraulic & Pneumatic system components
	3rd	air Motors
	4th	Hydraulic Actuator – single and double cylinder
	5th	Hydraulic Actuator – single and double cylinder
9th	**1st**	Valves: Classification of valves, pressure control, directional control, sequencing, synchronizing and flow control valve
	2nd	Valves: Classification of valves, pressure control, directional control, sequencing, synchronizing and flow control valve
	3rd	Accessories of hydraulic & pneumatic circuit
	4th	Accessories of hydraulic & pneumatic circuit

	5th	Filters: Type, functions, construction
10th	**1st**	Filters: Type, functions, construction
	2nd	CLASS TEST
	3rd	Hoses & connectors: Type, construction and applications
	4th	Hoses & connectors: Type, construction and applications
	5th	Seals and gaskets: Types, function, construction
11th	**1st**	Seals and gaskets: Types, function, construction
	2nd	CLASS TEST
	3rd	Hydro Pneumatic Systems & Circuits
	4th	Comparison of Hydraulic and Pneumatic circuits.
	5th	Comparison of Hydraulic and Pneumatic circuits.
12th	**1st**	Hydraulic Circuits: Meter in, Meter out, Bleed off, Sequencing
	2nd	Hydraulic Circuits: Meter in, Meter out, Bleed off, Sequencing
	3rd	Applications of hydraulic circuits Simple Pneumatic Circuits
	4th	Speed Control Circuits, Sequencing circuits, Application of Pneumatic Circuits

	5th	Speed Control Circuits, Sequencing circuits, Application of Pneumatic Circuits