



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



## LESSON PLAN

**SUBJECT: Th-3 (HYDRAULICS & PNEUMATIC CONTROL)**

### CHAPTERWISE 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. SUBHRAJYOTI ROUT
Week	Class Day	Theory/Practical Topics
1 <sup>st</sup>	1 <sup>st</sup>	Define fluid, description of fluid properties like Density, Specific weight, specific gravity,
	2 <sup>nd</sup>	Specific volume, Dynamic viscosity, kinematic viscosity, surface tension Capillary phenomenon. Solve simple numerical.
	3 <sup>rd</sup>	Specific volume, Dynamic viscosity, kinematic viscosity, surface tension Capillary phenomenon. Solve simple numerical.
	4 <sup>th</sup>	Measurement of pressure
	5 <sup>th</sup>	Concept of atmospheric pressure, gauge pressure, absolute pressure, pressure gauges- Piezometer tube
2 <sup>nd</sup>	1 <sup>st</sup>	Concept of atmospheric pressure, gauge pressure, absolute pressure, pressure gauges- Piezometer tube
	2 <sup>nd</sup>	simple & differential manometer, Micro Manometer (simple problems on manometers) Bourdon tube pressure gauge
	3 <sup>rd</sup>	simple & differential manometer, Micro Manometer (simple problems on manometers) Bourdon tube pressure gauge
	4 <sup>th</sup>	Law of continuity and its application
	5 <sup>th</sup>	Bernoulli's Theorem
3 <sup>rd</sup>	1 <sup>st</sup>	Energy possessed by the liquid in motion, Bernoulli's theorem and its applications
	2 <sup>nd</sup>	Energy possessed by the liquid in motion, Bernoulli's theorem and its applications
	3 <sup>rd</sup>	such as venturimeter, orifice meter & pitot tube (Analytical treatment with derivation for measurement of discharge is expected)
	4 <sup>th</sup>	Hydraulic Coefficients

	<b>5<sup>th</sup></b>	Concept of vena contract. Coefficientofcontraction
<b>4<sup>th</sup></b>	<b>1<sup>st</sup></b>	coefficient of velocity, coefficient of discharge, relation between the hydraulic coefficients.
	<b>2<sup>nd</sup></b>	coefficient of velocity, coefficient of discharge, relation between the hydraulic coefficients.
	<b>3<sup>rd</sup></b>	Typesoffluidflow
	<b>4<sup>th</sup></b>	Steady, unsteady, rotational, irrotational, laminar, turbulent, one, two & three dimensional flow, uniform & non uniform flow
	<b>5<sup>th</sup></b>	Steady, unsteady, rotational, irrotational, laminar, turbulent, one, two & three dimensional flow, uniform & non uniform flow
<b>5<sup>th</sup></b>	<b>1<sup>st</sup></b>	SimpleHydraulicdevices. Working principles, construction and applications of hydraulic jack, hydraulic Ram, hydraulic lift, hydraulic press
	<b>2<sup>nd</sup></b>	SimpleHydraulicdevices. Working principles,constructionandapplicationsof hydraulic jack,hydraulic Ram, hydraulic lift, hydraulic press
	<b>3<sup>rd</sup></b>	CentrifugalPumps
	<b>4<sup>th</sup></b>	Types, construction & working of centrifugal pump. Types of casing. Need of priming,Heads
	<b>5<sup>th</sup></b>	Types, construction &working of centrifugalpump.Types of casing.Need of priming, Heads
<b>6<sup>th</sup></b>	<b>1<sup>st</sup></b>	Losses&efficienciosofcentrifugalpump(NOanalytical treatment).Netpositivesuctionhead,faultfinding &remedies,pump selection
	<b>2<sup>nd</sup></b>	Losses&efficienciosofcentrifugalpump(NOanalytical treatment).Netpositivesuctionhead,faultfinding &remedies,pump selection
	<b>3<sup>rd</sup></b>	ReciprocatingPumps
	<b>4<sup>th</sup></b>	Constrictionandworking of single&doubleacting reciprocating pump,positive & negative slip

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

	<b>5<sup>th</sup></b>	Filters:Type,functions,construction
<b>10<sup>th</sup></b>	<b>1<sup>st</sup></b>	Filters:Type,functions,construction
	<b>2<sup>nd</sup></b>	CLASSTEST
	<b>3<sup>rd</sup></b>	Hoses&connectors:Type,constructionandapplications
	<b>4<sup>th</sup></b>	Hoses&connectors:Type,constructionandapplications
	<b>5<sup>th</sup></b>	Sealsandgaskets:Types,function,construction
<b>11<sup>th</sup></b>	<b>1<sup>st</sup></b>	Sealsandgaskets:Types,function,construction
	<b>2<sup>nd</sup></b>	CLASSTEST
	<b>3<sup>rd</sup></b>	HydroPneumaticSystems&Circuits
	<b>4<sup>th</sup></b>	ComparisonofHydraulicandPneumaticcircuits.
	<b>5<sup>th</sup></b>	ComparisonofHydraulicandPneumaticcircuits.
<b>12<sup>th</sup></b>	<b>1<sup>st</sup></b>	HydraulicCircuits: Meterin,Meterout,Bleedoff,Sequencing
	<b>2<sup>nd</sup></b>	HydraulicCircuits: Meterin,Meterout,Bleedoff,Sequencing
	<b>3<sup>rd</sup></b>	Applicationsofhydrauliccircuits Simple Pneumatic Circuits
	<b>4<sup>th</sup></b>	SpeedControlCircuits,Sequencingcircuits,ApplicationofPneumaticCircuits

	5 <sup>th</sup>	SpeedControlCircuits,Sequencingcircuits,ApplicationofPneumaticCircuits
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