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

LESSON PLAN

SUBJECT: TH-3 (HYDAULIC & 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	INTRODUCTION TO CAD/CAM	6	7
2	GEOMETRICMODELING	12	13
3	INTRODUCTION TO COMPUTER NUMERICAL CONTROL	6	6
4	PARTPROGRAMMING	14	14
5	INDUSTRIAL ROBOTICS	12	14
6	AUTOMATION	10	12
	Total Period:	**60**	**62**

Discipline: AUTOMOBILE ENGINEERING	Semester: 4th	**Name of the Teaching Faculty:** Er.Subhrajyoti Rout
		SESSION : 2023-24 **EXAMINATION :** 2024(S)
Week	**Class Day**	**Topics to be Covered**
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
2nd	**1st**	Concept of atmospheric pressure, gauge pressure, absolute pressure, pressure gauges- Piezometer tube
	2nd	Concept of atmospheric pressure, gauge pressure, absolute pressure, pressure gauges- Piezometer tube
	3rd	simple & differential monometer, MicroManometer (simple problems on manometers) Bourdon tube pressure gauge
	4th	simple & differential monometer, MicroManometer (simple problems on manometers) Bourdon tube pressure gauge
3rd	**1st**	Law of continuity and its application
	2nd	Bernoulli's Theorem
	3rd	Energy possessed by the liquid in motion, Bernoulli's theorem and its applications
	4th	Energy possessed by the liquid in motion, Bernoulli's theorem and its applications
4th	**1st**	such as venturimeter, orifice meter &pitot tube (Analytical treatment with derivation for measurement of discharge is expected)
	2nd	Hydraulic Coefficients
	3rd	Concept of vena contract. Coefficient of contraction
	4th	coefficient of velocity, coefficient of discharge, relation between the hydraulic coefficients.
5th	**1st**	coefficient of velocity, coefficient of discharge, relation between the hydraulic coefficients.
	2nd	Types of fluid flow
	3rd	Steady, unsteady, rotational, irrotational, laminar, turbulent, one, two & three dimensional flow, uniform & non uniform flow
	4th	Steady, unsteady, rotational, irrotational, laminar, turbulent, one, two & three dimensional flow, uniform & non uniform flow
6th	**1st**	Simple Hydraulic devices. Working principles, construction and applications of hydraulic jack, hydraulic Ram, hydraulic
	2nd	Simple Hydraulic devices. Working principles, construction and applications of hydraulic jack, hydraulic Ram, hydraulic
	3rd	Simple Hydraulic devices. Working principles, construction and applications of hydraulic jack, hydraulic Ram, hydraulic

Week	Class Day	Topics to be Covered
6th	4th	Centrifugal Pumps
7th	1st	Types, construction & working of centrifugal pump. Types of casing. Need of priming, Heads
	2nd	Types, construction & working of centrifugal pump. Types of casing. Need of priming, Heads
	3rd	Losses & efficiencies of centrifugal pump (NO analytical treatment). Net positive suction head, fault finding &remedies, pump selection
	4th	Losses & efficiencies of centrifugal pump (NO analytical treatment). Net positive suction head, fault finding &remedies, pump selection
8th	1st	Reciprocating Pumps
	2nd	Constriction and working of single & double acting reciprocating pump, positive & negative slip
	3rd	Constriction and working of single & double acting reciprocating pump, positive & negative slip
	4th	Air vessels- their function & advantages.
9th	1st	Power & efficiencies of reciprocating pump. Reasons of cavitations & separation
	2nd	**INTERNAL ASSESSMENT**
	3rd	**INTERNAL ASSESSMENT**
	4th	Basic components of Hydraulic & Pneumatic systems.
10th	1st	Hydraulic & Pneumatic system components
	2nd	Hydraulic & Pneumatic system components
	3rd	air Motors
	4th	Hydraulic Actuator – single and double cylinder
11th	1st	Hydraulic Actuator – single and double cylinder
	2nd	Valves: Classification of valves, pressure control, directional control, sequencing, synchronizing and flow control valve
	3rd	Valves: Classification of valves, pressure control, directional control, sequencing, synchronizing and flow control valve
	4th	Accessories of hydraulic & pneumatic circuit
12th	1st	Accessories of hydraulic & pneumatic circuit
	2nd	Filters: Type, functions, construction
	3rd	Filters: Type, functions, construction
	4th	Filters: Type, functions, construction

Week	Class Day	Topics to be Covered
13th	1st	Hoses & connectors: Type, construction and applications
	2nd	Hoses & connectors: Type, construction and applications
	3rd	Hoses & connectors: Type, construction and applications
	4th	Seals and gaskets: Types, function, construction
14th	1st	Seals and gaskets: Types, function, construction
	2nd	Hydro Pneumatic Systems & Circuits
	3rd	Comparison of Hydraulic and Pneumatic circuits.
	4th	Comparison of Hydraulic and Pneumatic circuits.
15th	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	Applications of hydraulic circuits Simple Pneumatic Circuits
16th	1st	Speed Control Circuits, Sequencing circuits, Application of Pneumatic Circuits
	2nd	Speed Control Circuits, Sequencing circuits, Application of Pneumatic Circuits
	3rd	Speed Control Circuits, Sequencing circuits, Application of Pneumatic Circuits
	4th	Revision