



GOVERNMENT POLYTECHNIC, NABARANGPUR

DEPARTMENT OF AUTOMOBILE ENGINEERING

Discipline: AUTOMOBILE ENGG	Semester: 4TH	Name of the Teaching Faculty: Er. Kiran Kumar Behera
Subject: Hydraulics and Pneumatic control	No. of days/per week class allotted: 04	Semester From date: 04.02.2025 To Date: 17.05.2025 No. of Weeks: 15
COURSE OUTCOMES	1. Understand the basic properties of fluid, important principles of hydraulics with their applications and hydraulic devices used in practice. 2. Identify fluid power system components and Select appropriate tools to dismantle & assemble the components 3. Diagnose probable causes of failure of component of hydraulic & pneumatic circuit and Verify the conditions of fittings, OTC, pipes, seals & packing of hydraulic systems in automobile vehicles. 4. Construct the hydraulic & pneumatic circuits for various applications.	
Week	Class Day	Theory/Practical Topics
1ST	1ST	Define fluid, description of fluid properties like Density, Specific weight, specific gravity, specific volume, Dynamic viscosity, kinematic viscosity, surface tension Capillary phenomenon.
	2ND	Solve simple numerical.
	3RD	Solve simple numerical.
	4TH	Revision
2ND	1ST	Measurement of pressure Concept of atmospheric pressure, gauge pressure, absolute pressure
	2ND	Micro Manometer (simple problems on manometers) Bourdon tube pressure gauge,
	3RD	Contd.
	4TH	Revision
3RD	1ST	simple problems on manometers) Bourdon tube pressure gauge,
	2ND	Contd.
	3RD	Contd.
	4TH	Revision
4TH	1ST	Hydro dynamics. 2.1 Law of continuity and its application
	2ND	Bernoulli's Theorem.
	3RD	Energy possessed by the liquid in motion, Bernoulli's theorem and its applications such as venturimeter, orifice meter & pitot tube
	4TH	Contd.
5TH	1ST	venturimeter, orifice meter & pitot tube (Analytical treatment with derivation for measurement of discharge is expected)
	2ND	Hydraulic Coefficients. Concept of vena contract.
	3RD	Coefficient of contraction, coefficient of velocity, coefficient of discharge, relation between the hydraulic coefficients.
	4TH	Contd.
6TH	1ST	Types of fluid flow. Steady, unsteady, rotational, irrotational, laminar, turbulent

7 TH	2 ND	one, two & three dimensional flow, uniform & non uniform flow
	3 RD	Contd.
	4 TH	Revision
	1 ST	Introduction to Simple Hydraulic devices.
8 TH	2 ND	Working principles, construction and applications of hydraulic jack
	3 RD	Contd
	4 TH	hydraulic Ram, hydraulic lift, hydraulic press.
	1 ST	Contd
	2 ND	Centrifugal Pumps. Types, construction & working of centrifugal pump

9 TH	3 RD	Types of casing. Need of priming, Heads, Losses & efficiencies of centrifugal pump (NO analytical treatment).
	4 TH	Net positive suction head, fault finding & remedies, pump selection.
10 TH	1 ST	Contd
	2 ND	QUIZ
	3 RD	Reciprocating Pumps. Constriction and working of single & double acting reciprocating pump
	4 TH	positive & negative slip.
11 TH	1 ST	Air vessels- their function & advantages
	2 ND	Reasons of cavitations & separation.
	3 RD	Revision
	4 TH	QUIZ
12 TH	1 ST	Hydraulic & Pneumatic system components
	2 ND	Air Motors
	3 RD	Hydraulic Actuator – single and double cylinder
	4 TH	Valves: Classification of valves, pressure control, directional control, sequencing, synchronizing and flow control valve.
13 TH	1 ST	Revision
	2 ND	quiz
	3 RD	Doubt clear
	4 TH	Doubt clear
14 TH	1 ST	Accessories of hydraulic & pneumatic circuit. Filters: Type, functions, construction
	2 ND	Contd
	3 RD	Hoses & connectors: Type, construction and applications.
	4 TH	Contd.
15 TH	1 ST	Seals and gaskets: Types, function, construction
	2 ND	Contd
	3 RD	QUIZ
	4 TH	Hydro Pneumatic Systems & Circuits Comparison of Hydraulic and Pneumatic circuits.
	1 ST	Hydraulic Circuits: Meter in, Meter out, Bleed off, Sequencing, Applications of hydraulic circuits
	2 ND	Contd.
	3 RD	Simple Pneumatic Circuits. Speed Control Circuits, Sequencing circuits, Application of Pneumatic Circuits
	4 TH	REVISION

LEARNING RESOURCES:

Sl. No.

Name of the Book

Author Name

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| 1. | Oil Hydraulic System- Principle and Maintenance | S.R. Mujumdar |
| 2. | Pneumatics System Principle and Maintenance | S.R. Mujumdar |
| 3. | Pneumatic and Hydraulic Control system | K..Shanmuga Sundaram |
| 4. | Fluid Mechanics and Hydraulic Machines | R. K. Bansa |



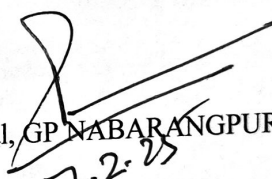
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coordinator


7.2.25

Principal, GP NABARANGPUR .