

LESSON PLAN 2023-24

SUBJECT :HYDRAULICS & PNEUMATIC CONTROL (4TH SEM)

NAME OF THE TEACHER : MUKESH KUMBHAR (GUEST FACULTY,MECH.)

Class No.	Topic	Subtopics	Teaching Aids/Activities
1–2	Introduction to Fluid Mechanics	Course overview, definition and scope, properties of fluids	Lecture, charts, videos
3–4	Fluid Properties	Density, specific weight, specific gravity, viscosity, surface tension, capillary phenomenon	Demonstrations, fluid samples, problem-solving
5	Pressure Measurement (Concepts)	Atmospheric, gauge, absolute pressure	Diagrams, animations
6–7	Pressure Measurement Devices	Piezometer tube, manometers (simple, differential), micro manometer	Manometer models, calculations
8	Bourdon Tube Pressure Gauge	Working principle and application	Gauge demo, industrial application video
9–10	Law of Continuity & Bernoulli's Eqn	Derivation and applications	Derivation, examples, flow visualization
11–12	Venturimeter and Orifice Meter	Working, discharge measurement, derivation	Cut section models, flow meter simulation
13	Pitot Tube	Principle and working	Working model
14	Hydraulic Coefficients	Vena contracta, coefficient of contraction, velocity, discharge	Comparative charts, problem-solving
15	Types of Fluid Flow	Steady, unsteady, rotational, laminar, turbulent etc.	Flow videos, interactive simulation
16	Revision & IA-I Prep	Summary of Units 1 & 2	Recap quiz, Q&A
17	Internal Assessment – I	Written Test (Units 1–2)	Assessment
18	Intro to Hydraulic Devices	Basics and significance	Lecture, real examples
19–20	Hydraulic Jack, Ram, Lift, Press	Construction, working principles, applications	Diagrams, working models, lab visit
21–22	Centrifugal Pump Basics	Types, construction, working	Pump models, case study videos
23	Centrifugal Pump Performance	Losses, heads, efficiencies, NPSH	Charts, numerical practice
24	Faults and Remedies in Pumps	Common issues, diagnosis, pump selection	Troubleshooting guide, fault demo
25–26	Reciprocating Pumps	Single & double acting, working, slip, air vessels	Cut models, animation
27	Power & Efficiency in Reciprocating Pumps	Cavitation, separation	Numerical examples
28	Intro to Hydraulic & Pneumatic Systems	Overview	Flow charts, comparative table

29	System Components	Description of basic components	Real parts demo
30	Air Motors	Working, types, applications	Videos, motor demo
31	Hydraulic Actuators	Single and double cylinder	Cross-section diagrams, lab demo
32–33	Valves – Classification	Pressure, directional, sequencing, synchronizing, flow control	Valve cutaway, hands-on session
34	Review & IA-II Prep	Summary of Units 3–4	MCQs, practice questions
35	Internal Assessment – II	Written Test (Units 3–4)	Assessment
36	Accessories: Filters	Types, functions, construction	Real filters, video
37	Hoses & Connectors	Types, construction, applications	Hose samples, industrial application
38	Seals and Gaskets	Types, function, construction	Hands-on demo, cut models
39	Intro to Hydraulic Circuits	Basic circuit types, use	Circuit diagrams, virtual simulator
40	Meter-in & Meter-out Circuits	Functioning and difference	Circuit demo kits
41	Bleed-off Circuit	Working, use in flow regulation	Flow regulation board
42	Sequencing Circuit	Sequential operation explanation	Circuit drawing, animation
43	Applications of Hydraulic Circuits	Real-world examples in automobiles	Case studies
44	Comparison: Hydraulic vs Pneumatic	Advantages, limitations, comparison table	Interactive discussion
45	Intro to Pneumatic Circuits	Basics of air-powered circuits	Circuit board kits
46	Speed Control Circuits	Working and application	Simulation, whiteboard diagram
47	Sequencing Pneumatic Circuits	Order of operation logic	Real example circuit kit
48	Pneumatic Circuit Applications	Use cases in automation, packaging etc.	Video case study, group activity
49–50	Practice Session	Drawing hydraulic & pneumatic circuits	Hands-on sheet drawing, circuit building
51	Fault Diagnosis in Systems	Hydraulic and pneumatic system diagnosis	Interactive troubleshooting
52	Maintenance of Systems	Tools, seal checking, OTC pipe inspections	Maintenance manual review, toolkit use
53	Project Circuit Planning	Students plan a circuit to solve a specific task	Group work, planning session
54	Project Work Execution	Build simple hydraulic/pneumatic circuit	Lab activity
55	Project Presentation	Explain and demonstrate project	PPTs, viva
56	Revision Session	Final revision of entire syllabus	Summary charts, MCQ practice
57	Mock Test	Practice exam	Written paper, timed

58	Discussion of Mock Test	Error analysis and doubt clearing	Group feedback session
59	Pre-exam Recap	Last-minute revision	Flashcards, short Q&A
60	Final Wrap-up & Feedback	Course feedback and guidance	Feedback forms, informal discussion