

LESSON PLAN 2025-26

NAME OF THE TEACHER : KUMAR GYANADEEP, LECT. (STAGE-II, AUTOMOBILE)				
Subject: Fluid Mechanics and Fluid Power (AEPC207) Program: Diploma in Automobile Engineering Semester: 3rd Total Contact Hours: 45 Total Marks: 100 Assessment: Progressive – 30, End Term – 70 Credits: 3				
COURSE OBJECTIVES: After completion of the course, the students will be able 1. Identify the properties of a fluid and hydrostatics. 2. Explain the basic kinematics and dynamics of fluid mechanics 3. Describe the flow through orifices, notches and pipes. 4. Classify different types of turbines and pumps. 5. Apply the knowledge of fluid power.				
Class No.	Topic	Subtopics	Teaching Aids / Activities	Course Objective
Unit I – Properties of Fluid & Hydrostatics (9 classes)				
1	Introduction to Fluids	Definition, classification (ideal, real, compressible, incompressible)	PPT, examples	CO1
2	Properties of Fluids (1)	Density, specific weight, specific gravity	Chart, real-world examples	CO1
3	Properties of Fluids (2)	Viscosity, surface tension	Demo with liquids, videos	CO1
4	Fluid Pressure	Concept, pressure head, Pascal's Law	Pressure tube demo	CO1
5	Hydrostatic Force	Total pressure & center of pressure on surfaces	Whiteboard derivation	CO1
6	Curved/Inclined Surface	Applications, location of center of pressure	Sketches, previous year problems	CO1
7	Manometers	Simple, differential, inverted manometers	Glass tube setup demo	CO1
8	Buoyancy & Floatation	Archimedes' principle, floating body, metacenter	Float test, case study	CO1
9	Practice & Numericals	Problems on pressure, manometer and floatation	Worksheet, quiz	CO1
Unit II – Kinematics & Dynamics of Fluid (6 classes)				
10	Types of Flow	Steady/unsteady, laminar/turbulent, uniform/non-uniform	Flow diagrams, animations	CO2
11	Flow Lines	Streamline, pathline, streakline	Chalkboard sketch	CO2
12	Fluid Energies & Continuity	Kinetic, potential, internal energy; continuity equation	Derivation + visuals	CO2
13	Bernoulli's Equation	Law and derivation	Derivation and chart	CO2
14	Venturimeter	Working, formula, application	Lab model/video	CO2
15	Pitot Tube & Flowmeter	Pitot static tube principle, velocity measurement	Demonstration with models	CO2
Unit III – Orifices, Notches & Pipes (9 classes)				
16	Orifices – Intro & Coefficients	Cc, Cv, Cd – concepts and relations	Board derivation	CO3
17	Discharge Equations	Orifice discharge, velocity of jet	Application problems	CO3
18	Weirs & Notches	Rectangular and triangular notches	Lab video	CO3

19	Numerical Problems	Notch & orifice discharge calculations	Worksheet	CO3
20	Pipe Flow – Basics	Definitions, types, fittings	Pipe models	CO3
21	Fluid Friction Laws	Darcy-Weisbach, Hazen-Williams	Chart, derivation	CO3
22	Loss of Head in Pipes	Major and minor losses, calculation	Sample calculations	CO3
23	Nozzle & Power Transmission	Use of nozzle, power equation	Design sketch	CO3
24	Numerical Practice	Pipes & nozzles – energy line, gradient line	Problem solving sheet	CO3

Unit IV – Turbines and Pumps (12 classes)

25	Classification of Turbines	Impulse & reaction, selection based on head/discharge	Chart, comparison table	CO4
26	Pelton Wheel	Construction, working principle	Pelton wheel model/video	CO4
27	Francis Turbine	Mixed flow reaction turbine	Working animation	CO4
28	Kaplan Turbine	Axial flow reaction turbine	Visual demo, model	CO4
29	Draft Tubes	Function, types	Diagram on board	CO4
30	Cavitation in Turbines	Causes, effects, prevention	Case study	CO4
31	Efficiency & Power	Calculations: Work done, efficiency	Numerical problems	CO4
32	Centrifugal Pump – Intro	Working principle, applications	Real pump demo/video	CO4
33	Components & Efficiency	Impellers, casings, priming, multistage, efficiency	Parts diagram	CO4
34	Reciprocating Pump – Basics	Single/double acting, working	Piston pump model	CO4
35	Reciprocating Pump Concepts	Slip, negative slip, cavitation	Explanation + numericals	CO4
36	Numerical Practice	Pumps – Efficiency, Work done, head	Quiz, worksheet	CO4

Unit V – Fluid Power (9 classes)

37	Intro to Fluid Power	Hydraulic vs Pneumatic systems	Comparison chart	CO5
38	Pascal's Law	Enclosed system, principle	Lab demo, bottle experiment	CO5
39	Hydraulic System Components	Reservoir, filter, valves, accumulator, actuator	Block diagram, actual parts	CO5
40	Valves & Actuators	Direction, flow control, linear/rotary actuators	Circuit symbols	CO5
41	Hydraulic Pumps	Gear, vane, piston types	Cut-section models	CO5
42	Hydraulic Circuits – Basics	Reading and drawing simple circuits	Schematic diagrams	CO5
43	Circuit Examples	Press operation, rotary actuator, holding job	Animation videos	CO5
44	Practice Problems & Case Study	Common fluid power problems	Class activity	CO5
45	Final Review & Mock Test	Complete syllabus revision	Model paper + doubt clearing	All COs


Signature of Teacher


Signature of HOD