Lesson Plan

Name of Institute : Ambala College of Engineering and Applied Research

Name of the Faculty member : Dr S. K. Jain

Discipline : Mechanical Engineering

Semester : 4th

Subject : Fluid Mechanics & Fluid Machines (B24-MEC-202)

Lesson Plan Duration : 15 weeks (from Jan 2026 to May 2026)

Work Load : 4L 1T 2P

Week	Theory		Practical	
	Lecture day	Topic (including assignment/ test)	Practical day	Topic
1st	1	Introduction of fluid mechanics	1	To verify the Bernoulli's Theorem
	2	Definition of fluid, Newton's law of viscosity		
	3	Units and dimensions		
	4	Properties of fluids		
	5	Numericals		
2nd	1	Hydrostatic law	2	To determine coefficient of discharge of an orifice meter
	2	Hydrostatic forces on submerged plane		
	3	Hydrostatic forces on curved plane		
	4	Buoyancy, stability of floating and submerged bodies		
	5	Numericals		
3rd	1	Types of fluid flows, stream, streak and path lines;	3	To determine the coefficient of discharge of Venturimeter
	2	Flow rate and continuity equation,		
	3	Differential equation of continuity in cartesian and polar		
	4	Rotation and vorticity, circulation		
	5	Numericals		
4th	1	Stream and potential functions	4	To determine the meta-centric height of a floating body
	2	Flow net Problems		
	3	Concept of system and control volume,		

	4	Numerical		
	5	Numericals		
5th	1	Euler's equation, Navier-Stokes equation	5	Determination of the performance characteristics of a centrifugal pump
	2	Bernoulli's equation		
	3	practical applications		
	4	Impulse momentum equation		
	5	Numericals		
6th	1	Flow regimes and Reynold's number.	6	Determination of the performance characteristics of a reciprocating pump
	2	Relationship between shear stress and pressure gradient		
	3	Exact flow solutions, Couette and Poisuielle flow,		
	4	Laminar flow through circular conduits.		
	5	Problems.		
7th	1	Darcy Weisbach equation, friction factor,	7	Determination of the performance characteristics of a gear pump
	2	Moody's diagram, losses in pipes, hydraulic gradient		
	3	Series and parallel connection of pipes, branched pipes;		
	4	Equivalent pipe, power transmission through pipes. Problems		
	5	Numericals		
8th	1	Concept of boundary layer,boundary layer thickness	8	Determination of the performance characteristics of Pelton Wheel
	2	Von-Karman momentum integral equation		
	3	laminar and turbulent boundary layer flows		
	4	Seperation of boundary layer		
	5	Sessional 1		
9th	1	Need and methods of dimensional analysis	9	Determination of the performance characteristics of a Francis Turbine
	2	Dimensionless parameters		
	3	Application of dimensionless parameters,		
	4	Problems.		
	5	Numericals		
10th	1	Introduction of Rotodynamic machines, Classifications	10	Determination of the performance characteristics of a Hydraulic Ram
	2	Velocity triangles; .		
	3	Centrifugal pumps, working principle, work done		

	4	Performance curves, Cavitation , minimum starting speed,		
	5	Numericals		
11th	1	Reciprocating pumps, working principle, Indicator diagram,	11	Viva Voce, Revision
	2	Effect of friction and acceleration, air vessels, Problems		
	3	Hydraulic Turbines: Introduction, Classification of turbines,		
	4	Heads and efficiencies,		
	5	Numericals		
12th	1	Velocity triangles,		
	2	Pelton wheel,working principles		
	3	Work done		
	4	Numericals		
	5	Numericals		
13th	1	Design of turbines,		
	2	Axial, radial and mixed flow turbines		
	3	Francis turbine		
	4	Numericals		
	5	Numericals		
14th	1	Kaplan turbines		
	2	Draft tube and types		
	3	Specific speed,		
	4	Unit quantities		
	5	Numericals		
15th	1	Performance curves for turbines,		
	2	governing of turbines.		
	3	Problems.		
	4	Sessional 2		
	5	Revision and interaction on overall syllabus		

Dr S K Jain 5-1-2026

(Signature of the teacher concerned with date)