

B.Tech 3rd Semester (Mechanical Engineering)

Lesson Plan: Fluid Mechanics & Machines (PCC-ME-303/21)

S.N.	Content to be Covered	Lect. No.
UNIT-1		
1	Introduction and Fluid Statics: Definition of fluid, Newton's law of viscosity,	1
2	properties of fluids, mass density, specific volume, specific gravity, viscosity and surface tension,	2
3	Stability of floating Bodies	3
4	Stability of Submerged bodies,	4
5	Determination of metacentric height	5
6	Numerical Problems	6
UNIT-2		
7	Fluid Kinematics and Fluid Dynamics: Different types of flows	7
8	Continuity equation, applications of continuity equation,	8
9	momentum equation and its applications,	9
10	Euler's equation, Bernoulli's equation and its applications,	10
11	Venturimeter, Orificemeter	11
12	Rotameter,	12
13	Numerical Problems	13
UNIT-3		
14	Laminar flow through pipes and Boundary Layer:	14
15	Exact flow solutions in channels and ducts,	15
16	Couette flow	16
17	Poisuille flow,	17
18	laminar flow through circular conduits,	18
19	concept of boundary layer, measurement of boundary layer thickness,	19
20	Von-Karman integral Momentum equation for boundary layer.,	20
21	Darcy Weisbach equation,	21
22	friction factor, Numerical Problems	22
UNIT-4		
23	Dimensional Analysis: Need for dimensional analysis,	23
24	methods of dimension analysis,	24
25	Similitude, types of similitude,	25
26	Dimensionless parameters, application of dimensionless parameters,	26

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27	similitude laws, Model testing,	27
28	Model testing of turbines , Numerical Problems	28
29	Model testing of pumps, Numerical Problems	29
	UNIT-5	
30	Hydraulic Turbines: Euler's equation,	30
31	theory of Rotodynamic machines, Introduction to hydro power plant	31
32	Classification of water turbines, heads and efficiencies, velocity triangles,	32
33	heads and efficiencies, velocity triangles,	33
34	Pelton turbine, working principles	34
35	Francis turbine, working principles	35
36	Kaplan turbines and their, working principles	36
37	draft tube, Specific speed, unit quantities,	37
38	performance curves for turbines,	38
39	governing of turbines, Numerical Problems	39
40	Numerical Problems	40
	UNIT-6	
41	Pumps: Centrifugal pumps: working principle	41
42	Various heads and efficiencies,	42
43	velocity components at entry and exit of the rotor,	43
44	velocity triangles, work done by the impeller,	44
45	velocity triangles, work done by the impeller,	45
46	Performance curves.	46
47	Reciprocating pump: Classifications,	47
48	working principle,	48
49	Indicator Diagram, Numerical Problems	49
50	Numerical Problems	50