

## LESSON PLAN

Subject Name – Fluid Mechanics & Fluid Power Engineering	Branch – Production Engineering
Subject Code – BPEPE601	Semester – 6th

Sl no.	Module	Topic(s)	Period/Hours
1.	I	Introduction: Physical properties of fluids, Density, Specific weight, Specific volume, Specific gravity, Compressibility, Elasticity, Surface tension, Capillarity, Vapour pressure, Viscosity, Ideal and real fluids,	1
2.	I	Concept of shear stress, Newtonian and Non-Newtonian Fluids.	2-3
3.	I	Fluid Statics: Pressure-Density-Height relationship, Manometers, Pressure on plane and curved surface, Centre of pressure,	4-5
4.	I	Buoyancy, Stability of immersed and floating bodies, Fluid masses subjected to uniform acceleration, Free and Forced vortex.	6-7
5.	I	Tutorial	8
6.	II	Fluid Dynamics: Basic Equations- equation of continuity, One-dimensional Euler's equations of motion and its integration to obtain Bernoulli's equation and Momentum equation.	9-11
7.	II	Dimensional Analysis and Principles of Model Testing: Dimensional homogeneity, Dimensional analysis, Rayleigh's method and Buckingham Theorem. Similarity laws and model studies. Distorted models.	12-17
8.	II	Tutorial	18
9.	III	Drag and lift: Drag and lift coefficient, pressure drag and friction drag on stream lined body and bluff body.	15-18
10.	III	Boundary layer separation & its control. Drag over flat plate. Profile drag,	19-22
11.	III	Drag characteristics of sphere, cylinder and disc. Circulation and lift on a circular cylinder, Magnus effect,	23-24
12.	III	Circulation and lift on an Airfoil.	25
13.	III	Tutorial	26
14.	IV	Hydraulic Turbines: Classification of turbines, Different heads and efficiencies of turbines, Study of Pelton	27-28
15.	IV	Francis and Kaplan turbines, Specific speed and unit quantities,	29-30
16.	IV	performance of turbines, Governing of turbines	31
17.	IV	Cavitation in reaction turbines, Principles of similarity applied to turbines.	32-33
18.	IV	Tutorial	34
19.	V	Centrifugal Pump: Principle, classification, pressure changes in a pump.	35-36
20.	V	Velocity vector diagrams and work done, minimum speed of pump to deliver liquid, multistage pumps. Similarity Relations and specific speed.	36-37
21.	V	Reciprocating pump: Principle of working, slip, work done, effect of acceleration and frictional resistances, separation, air vessels.	38-39
22.	V	Tutorial	40