Lesson Plan

Name of Faculty : Pawan Kumar, Associate Professor
Discipline : Mechanical Engg.
Semester : 4th
Subject : Fluid Mechanics and Fluid Mechanics lab
Lesson Plan Duration: 15 weeks

Week	Theory		Practical	
	Lecture Day	Topic (Including Assignment/Test)	Practical Day	Topic
Unit-I : Fluid Properties, Fluid Statics & Kinematics				
1st	1	Basics about subject like force, pressure etc. and their units and What is Fluid Mechanics Introduction and relation with other subjects	1	To verify the Bernoulli's Theorem.
	2	Concept of fluid and flow, Viscosity, ideal and real fluids, continuum concept		
	3	Properties of fluid, Newtonian and non-Newtonian fluids, Pascal's Law & Monometers		
2nd	4	Hydrostatic equation, hydrostatic forces on plane & curved surfaces	2	To determine the meta centric height of a floating body.
	5	Buoyancy and flotation, Archimedes Principle, Stability of floating and submerged bodies		
	6	Meta centre and Metacentric height		
3rd	7	Eulerian and lagrangian description of fluid flow	3	To determine the minor losses due to pipe fitting in pipes.
	8	Types of flows , Flow rate and continuity equation , continuity equation in		
	9	continuity equation in cylindrical coordinates & polar coordinates.		
4th	10	Rotation and vorticity circulation, Stream function	4	To determine the major losses due to friction in pipe flow.
	11	potential function, flow net		
	12	Problem and solutions		
Unit-II : Fluid Dynamics, Orifices, Mouthpieces				
5th	13	Energy and forces acting on a flowing fluid, Equations of motion	5	To determine the coefficient of discharge of Venturimeter.
	14	Euler's equation		
	15	Bernoulli's equation, Venturimeter , Orifices, Orifice meter		
6th	16	Classification of orifices and mouthpieces,	6	To determine the coefficient of discharge of notch (V and Rectangular types).
	17	Hydraulic coefficients, Discharge through a large rectangular orifice,		
	18	Time of emptying a tank through an orifice, Classifications of notches and weirs		
7th		**1st Minor Test**		
8th	19	Empirical formulae for discharge over rectangular weirs	7	To determine the coefficient of discharge of an orifice meter.
	20	Discharge over rectangular & triangular notch		
	21	Assignment 1		
Unit-III : Viscous Flow, Turbulent flow				
9th	22	Flow regimes and Reynold's Relationship between shear stress and	8	To Find critical Reynolds number for a pipe flow.

		pressure gradient number		
	23	Laminar flow between two parallel plates when both plates are at rest		
	24	Hagen Poiseuilli law, (Couette flow) turbulence, Darcy-Weisbach equation		
10th	25	Boussinesq's theory, Reynolds theory, Prandtl's mixing length theory	9	**Internal Vivo-Vice-1**
	26	Von-Karman similarity concept, Universal velocity distribution equation friction coefficients for smooth and rough pipes,,		
	27	Hydro dynamically smooth and rough boundaries, Velocity distribution for smooth and rough pipes, Moody diagram		
Unit- :IV Boundary Layer Theory & Turbulent Flow				
11th	28	Major and minor head losses in pipes,	10	To determine the coefficient of discharge, contraction & velocity of an orifice
	29	hydraulic gradient and total energy lines, Pipes in series and parallel, equivalent pipe, branched pipes,		
	30	power transmission through pipes, numerical		
12th	31	Description of boundary layer, displacement, momentum and energy thickness,	11	To determine the density and viscosity of any three fluids.
	32	Drag force on a flat plate (Von Karman momentum integral equation),		
	33	Bou Blasius solution for laminar boundary layer		
13th	34	Velocity profiles for laminar boundary layer,	12	To determine the minor losses due to sudden enlargement, sudden contraction and bends.
	35	boundary layer separation and control		
	36	Problems and Solutions		
14th	**2nd Minor Test**			
15th	37	Problems and Solutions	13	**Internal Vivo-Vice-2**
	38	Assignment-II		
	39	Presentation		

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