GYANMANJARI INSTITUTE OF TECHNOLOGY

Department of Mechanical Engineering

LECTURE AND LAB/TUTORIAL PLAN

Course Code :	2141906	Year/Semester :	BE II Year/ 4TH Semester
Course Name :	Fluid Mechanics	Academic Year :	20116-17/ EVEN
L –T- P :	4-0-2	Credit :	6
Course Detail :	Theory and Practical	Term Start Date :	16/01/2017
Course Coordinator :	Prof.Krunal Khiraiya	Term End Date :	18/05/2017
Team of Instructors :	Mr.Yogesh Rathod	Class Test 1 :	19/2/2017
		Class Test 2 :	10/3/2017
		Mid Term Exam :	27/3/2017

Lesson Plan

Academic Year : 2016-17 Second Term			Sem. : 4th sem			
Name of Teacher : Krunal Khiraiya			Name of Department : Mechanical Engineering			
Subject : FM			Hrs./Week : 4			
Theory/Tutorial : Theory			Days : Tuesday Wednesday Thursday Friday			

Sr. No.	Name of Unit/Topics	Hrs. Alloted	Planned Date	Actual Date	Teaching Aid Code	Remarks
1	**Unit 1Fluids and Their Properties**	**3**				
A	Introduction of fluid, fluid classifications, hypothesis of continuum, Shear stress in a moving fluid, molecular structure of material,	1	17/1/2017		5	
B	fluid density, viscosity, causes of viscosity in gases and liquids	1	18/1/2017		5	
C	surface tension, capillary effect, vapor pressure, cavitation, compressibility and the bulk modulus	1	19/1/2017		5	
2	**Unit 2 Pressures and Head:**	**5**				
A	Types of Pressure, Pascal's law of pressure at a point	1	20/2/2017		5	
B	variation of pressure vertically in a fluid under gravity, equality of pressure at the same level in a static fluid	1	20/2/2017		2	
C	general equation for the variation of pressure due to gravity from a point to point in a static fluid	1	24/2/2017		2,5	
D	pressure and head, the hydrostatic paradox	1	25/1/2017		2	
E	pressure measurements using Elastic Pressure Transducers, Force Balance Pressure gauge, Electrical Pressure Transducers	1	27/1/2017		2	
3	**Unit 3 Static Forces on Surface and Buoyancy**	**8**				
A	Fluid static, action of fluid pressure on surface	1	27/1/2017		5	
B	resultant force and center of pressure on a plane surface under uniform pressure	1	31/1/2017		5	
C	resultant force and center of pressure on a plane surface immersed in a liquid	1	1/2/2017		5	
D	pressure diagrams, forces on a curved surface due to hydrostatic pressure	1	2/2/2017		2,5	
E	buoyancy, equilibrium of floating bodies	1	Cover in Lab		2,5	
F	stability of a submerged body, stability of floating bodies	1	Cover in Lab		2	
G	determination of the metacentric height, determination of the position of the metacentre relative to the center of buoyancy	1	Cover in Lab			
H	Numerical	1	3/2/2017			
4	**Unit 4Motion of Fluid Particles and Streams**	**4**				
A	Fluid flow, different types of flow, frames of reference, analyzing fluid flow	1	3/2/2017		5	
B	motion of a fluid particle, acceleration of a fluid particle, discharge and mean velocity	1	5/2/2017		5	
C	continuity of flow, continuity equations for 2-D and 3-D flow in Cartesian coordinates of system	1	5/2/2017		2,5	

D	Numerical	1	7/2/2017		2	
5	**Unit 5 The Energy Equation and its Application**	**8**				
A	Momentum and fluid flow, Momentum equation for 2-D and 3-D flow along a stream line	1	8/2/2017		5	
B	momentum correction factor	1	9/2/2017		5	
C	Euler's equation of motion along a stream line	1	10/2/2017		5	
D	Mechanical energy of a flowing fluid Bernoulli's theorem	1	14/2/2017		5	
E	kinetic energy correction factor	1	15/2/2017		5	
F	pitot tube, determination of volumetric flow rate via pitot tube, changes of pressure in tapering pipe	1	16/2/2017		5	
G	principle of venturimeter, pipe orifices	1	17/2/2017		5	
H	theory of small orifices discharging to atmosphere, theory of large orifices	1	19/2/2017		2,5	
I	Rotameter, elementary theory of notches and weirs, flow in a curved path	1	19/2/2017		2,5	
6	**Unit 6 Two-Dimensional Ideal Fluid Flow**	**4**				
A	Rotational and ir-rotational flow, circulation and vorticity	1	21/2/2017		2,5	
B	streamlines and the stream functions, velocity potential and potential flow	1	22/2/2017		5	
C	relation between stream function and velocity potential; flow nets	1	23/2/2017		5	
D	stream function and velocity potential for uniform flow, vortex flow.	1	28/2/2017		2,5	
7	**Unit 7 Dimensional Analysis And Similarities**	**5**				
A	Dimension reasoning, dimensional homogeneity	1	1/3/2017		5	
B	dimensional analysis using Rayleigh's method	1	2/3/2017		5	
C	Buckingham π-theorem, significance of dimensionless	1	3/3/2017		5	
D	use of dimensionless numbers in experimental investigation	1	5/3/2017		5	
E	geometric similarity, dynamic similarity,Kinematic similarity, model testing-Model laws, Undistorted and Distorted models.	1	5/3/2017		5	
8	**Unit 8 Viscous Flow**	**6**				
A	Reynolds number and Reynolds experiment	1	7/3/2017		5	
B	flow of viscous fluid through circular pipe- Hagen Poiseuille formula	1	8/3/2017		5	
C	Flow of viscous fluid between two parallel fixed plates	1	9/3/2017		5	
D	power absorbed in viscous flow through - journal, foot step and collar bearing	1	10/3/2017		5	
E	movement of piston in dash pot	1	14/3/2017		5	
F	Methods of measurement of viscosity.	1	15/3/2017		5	
9	**Unit 9 Turbulent Flow**	**4**				
A	Expression for coefficient of friction -Darchy Weishbach Equation,	1	16/3/2017		5	

B	Expression for coefficient of friction -Darchy Weishbach Equation,	1	19/3/2017		5	
C	Moody diagram resistance of smooth and rough pipes	1	19/3/2017		5	
D	shear stress and velocity distribution in turbulent flow through pipes.	1	21/3/2017		5	
10	**Unit 10 Flow through pipes**	**6**				
A	Major energy losses, Minor energy losses	1	22/3/2017		5	
B	Hydraulic gradient and total energy lines	1	23/3/2017		5	
C	Pipes in series and parallel, Equivalent pipes	1	24/3/2017		5	
D	Siphon, power transmission through pipe	1	5/4/2017		5	
E	Flow through nozzle at end of pipe	1	6/4/2017		5	
F	Water hammer in pipes	1	7/4/2017		5	
11	**Unit 11 Compressible Flow**	**3**				
A	Basic equations for one dimensional compression	1	11/4/2017		2,5	
B	Pressure wave propagation, sound velocity in fluid	1	12/4/2017		2,5	
C	Mach number, Stagnation properties	1	13/4/2017		2,5	

	Teaching Aid Code:	
1	O.H.P	
2	L.C.D PROJECTER	Sign of Teacher : _____
3	MODEL	
4	CHART	
5	OTHER (VIDEO)	Sign of H.O.D : _____

*** Remark column should cover any slippages and remedial action planned**

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Reference Books:

1. Fluid Mechanics and Fluid Power Engineering by D.S. Kumar, S.K.Kataria & Sons

2. Fluid Mechanics and Hydraulic Machines by R.K. Bansal, Laxmi Publications

3. Fluid Mechanics and Hydraulic Machines by R.K. Rajput, S.Chand & Co.

4. Fluid Mechanics by Frank .M. White, McGraw Hill Publishing Company Ltd.

5. Fundamentals of Fluid Mechanics by Munson, Wiley India Pvt. Ltd

6. Fluid Mechanics by A. K. Mohanty, PHI Learning Pvt. Ltd.

7. Laboratory Manual Hydraulics and Hydraulic Machines by R V Raikar