

	GURGAON INSTITUTE OF TECHNOLOGY & MANAGEMENT
	COURSE PLAN

Name of the Teacher:	Vinod Yadav
Department: Mechanical	Session: Jan-June 2018
Branch/Semester: Mechanical/ 4th	Subject Name & Code: Fluid Mechanics (ME-208-F)

Books Referred:**Text Books :**

- 1 Fluid Mechanics and Hydraulic Machines-Dr.R.K. Bansal – Laxmi Publication
2. Fluid Mechanics and Fluid Power Engineering – D.S. Kumar, S.K. Kataria and Sons

Reference Books :

1. Introduction to Fluid Mechanics and Fluid Machines – S.K. Som and G.Biswas, TMH
2. Fluid Mechanics – Streeter V L and Wylie E B, Mc Graw Hill

Lecture	Topics to be Covered
1.	Introduction to fluid mechanics and its applications, Fluid Statics, Kinematics and dynamics
2.	Concept of fluid and flow, ideal and real fluids, continuum concept
3.	Properties of fluids in detail
4.	Newtonian and non-Newtonian fluids. Pascal's law, hydrostatic equation
5.	Hydrostatic forces on plane and curved surfaces, stability of floating and submerged bodies
6.	Relative equilibrium , numerical problems
7.	Introduction to Fluid Kinematics, Eulerian and Lagrangian description of fluid flow
8.	Stream, streak and path lines and types of flows
9.	Flow rate and continuity equation, differential equation of continuity in cylindrical and polar coordinates
10.	Rotation, vorticity and circulation , Numerical Problem
11.	Stream and potential functions, Numerical Problem
12.	Fluid Dynamics: Concept of system and control volume, Euler's equation, Bernoulli's equation
13.	Venturimeter, orifices, orificemeter
14.	Performance Characteristics, Governing of reaction turbine



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15.	Mouthpieces, kinetic and momentum correction factors
16.	Impulse momentum relationship and its applications , Numerical Problems
17.	Compressible Fluid Flow: Introduction, continuity momentum and energy equation
18.	Sonic velocity, propagation of elastic waves due to compression of fluid
19.	Propagation of elastic waves due to disturbance in fluid, stagnation properties
20.	Isentropic flow, effect of area variation on flow properties, isentropic flow through nozzles
21.	Viscous Flow and Flow regimes and Reynolds's number, Relationship between shear stress and pressure gradient
22.	Movement of piston in a dashpot, power absorbed in bearings and Problems
23.	Flow Through Pipes: Major and minor losses in pipes, Hagen-Poiseuille law
24.	Hydraulic gradient and total energy lines
25.	Series and parallel connection of pipes, power transmission and numerical problems
26.	Boundary Layer Flow: Boundary layer concept, displacement, momentum and energy thickness, Von-Karman momentum integral equation
27.	Laminar and turbulent boundary layer flows, drag on a flat plate
28.	Boundary layer separation and control. Streamlined and bluff bodies lift and drag on a cylinder and an airfoil problems
29.	Turbulent Flow: Shear stress in turbulent flow Prandtl mixing length hypothesis
30.	Hydraulically smooth and rough pipes and Velocity distribution in pipes