Course Code	Course Title	L-T-P	Credit
IME-301	**Fluid Mechanics**	3-1-0	4

Course Objective:
It imparts the basic concept; knowledge and laws of fluid flow; Fluid dynamics and kinematics and idea of estimation of various losses encountered in fluid flow PRE REQUISITES Knowledge of Thermodynamics.

Unit-I: FLUID PROPERTIES AND FLUID STATICS
Concept of fluid and flow; ideal and real fluids; Continuum concept; properties of fluids; Newtonian and non-Newtonian fluids; Pascal's Law; hydrostatic equation; hydrostatic forces on plane and curved surfaces; stability of Floating and submerged bodies; relative equilibrium; Problems

Unit-II: FLUID KINEMATICS AND DYNAMICS
Eulerian and Lagrangian description of fluid flow; stream; streak and path lines; types of flows; flow rate and continuity equation; differential equation of Continuity; rotation; vorticity and circulation; stream and potential functions; Problems Concept of system and control volume; Euler's equation; Bernoulli's equation; Venturimeter; pitot tubes; orifice meter; kinetic and momentum correction factors; Impulse momentum relationship and its applications; Problems

Unit-III: VISCOUS FLOW
Flow regimes and Reynolds's number; Relationship between shear stress and pressure gradient; uni- directional flow between stationary and moving parallel plates; Counter flow; laminar flow through pipes

Unit-IV: FLOW THROUGH PIPES
Friction loss in pipe flow; Darcy-Weisbach formula co-efficient of friction and friction factor: Major and minor losses in pipes; hydraulic Gradient and total energy lines; series and parallel connection of pipes; branched pipes; Equivalent pipe; power transmission through pipes; Problems

Unit-V: BOUNDARY LAYER CONCEPT
Displacement; momentum and energy thickness; von-karman momentum integral equation; laminar and turbulent boundary layer flows; drag on a flat plate; boundary layer separation; Stream lined and bluff bodies; lift and drag on a cylinder and an airfoil; Problems

Text Book:
1. Kumar, K.L., "Engineering Fluid Mechanics", Eurasia Publication House, 2002

Reference Books:
1. Kumar, D. S., "Fluid Mechanics and Fluid Power Engineering", SK Kataria and Sons,1998
2. Wylie, E. B, Streeter VL; "Fluid Mechanics";McGrawHill1983
3. SomSKandBiswasG.,"IntroductiontoFluidMechanicsandFluidMachines",TataM cGrawHill, 1998
4. Bansal RK, "A Text Book of Fluid Mechanics" Laxmi Publications
5. Agrawal, S.K. "Fluid Mechanics and Machinery", Tata McGraw Hill.

Course outcomes:
1. Students can apply the mathematical knowledge in fluid flow and its characteristics.
2. Analyze the fluid flow through circular conduits.
3. Upon completion of this course, the students can able to apply mathematical knowledge to predict the properties and characteristics of a fluid