SUBJECT NO-MA40011, SUBJECT NAME- FLUID MECHANICS

LTP- 3-1-0,CRD- 4

SYLLABUS :-

Prerequisite: PDE Kinematics of Fluids in Motion : Continuum Hypothesis, Lagrangian and Eularian description, Introduction to stream lines, velocity potential, vorticity vector etc., Equation of continuity. Equations of Motion, Euler s equations of motion, Bernouli s equation. Potential flows. Three-dimensional flows : Singularities and image systems. Weiss sphere theorem, axi-symmetric flows, Stokes stream function. Two-dimensional flows : stream function and complex potential for two â dimensional, irrotational incompressible flows, two-dimensional image systems, Milne-Thomson circle theorem and its applications, Blasius theorem, use of conformal transformations, Kutta- Joukowski condition, Karman vortex street. Viscous flows : stress analysis in fluid motion, relations between stress and rate of strain, Navier â Stokes equations of motion of a viscous fluid, some exact solutions of Navier â Stokes equations, flow past a sphere, Prandtl s boundary layer theory, Karman s integral equation, inviscid compressible flow - Propagation of pressure change.