# 10 CE 307 FLUID MECHANICS (SI UNITS)

**II B.Tech I Semester**

*(with effect from the academic year 2011-2012)*

*Credits: 4*

*Lectures/Week : 4 hrs* *Sessional marks40*

*UniversityExam:3hrsEnd Examination Marks: 60*

## UNIT – I

**Fluid properties:** Mass density, weight density, specific volume, relative density, viscosity, compressibility, surface tension and capillarity and standard atmosphere pressure, Vapour pressure.

**Fluid static's:** Fluid pressure Pascal's law, absolute and gauge pressure, hydrostatic force on surfaces- total pressure and center of pressure on plane surfaces.

## UNIT –II

**Fluid kinematics:** Type of fluid flow, type of flow lines, rate of flow, velocity potential and stream function continuity equation.

**Fluid dynamics:**Eluer's equation- Bernoulli's equation and its application momentum equation and moment of momentum equation.

## UNIT –III

**Pressure Measurements**: Piezometer, manometer-differential manometers, micro manometers, velocity measurements- Pitot tube.

**Discharge measurement**: Orifice and mouthpiece- venturimeter, Orifice meter and Nozzle-meter.

## UNIT –IV

**Laminar flow:** Relationship between shear stress and pressure gradients- laminar flow through circular pipes- Hagenpoisulle law- loss of head due to friction.

**Turbulent flow:** Loss of head due to friction in pipe- Darcy- Wersbach equation Minor head losses- pipes in series and parallel siphon.

## UNIT – V

**Boundary layer concept:** Boundary layer growth over a flat plate- Boundary layer thickness, displacement thickness, momentum thickness and energy thickness- turbulent boundary layer-separation of boundary layer.

**Flow around submerged objects:** Drag and lift- types of drag on flat and cylinder lift on circular and air foils.

**TEXT BOOKS:**


1) Fluid Mechanics with egg. Applications :.Daugherty R.L etal.
2) Fluid Mechanics and Fluid Machinery : Rajput R.K.
3) Fluid Mechanics and Fluid Machinery :.Bhansal R.K.

**REFERENCES:**


1) Hydraulics and Fluid Mechanics : Modi and Sethi.
2) Theory and applications of Fluid Mechanics : Subramanyam K.