CE 308 Water Resources Engineering

Course Contents
Hydraulic processes: control volume approach, continuity, energy, momentum, velocity distribution,

Hydrologic processes: introduction to hydrology, precipitation, evaporation, and infiltration, Surface runoff: drainage basins and storm hydrograph, hydrologic losses, unit hydrograph, Streamflow routing: hydrologic reservoir routing, hydrologic river routing, hydraulic routing,

Introduction to pipe flow: classification of flow, head losses, forces in pipe flow,

Introduction to open channel flow: steady uniform flow, specific energy and specific forces, steady and gradually varied flow, rapidly varied flow, discharge measurement,

Introduction to groundwater flow: groundwater concepts, saturated flow, steady state one dimensional flow, steady state well hydraulics, transient well hydraulics, and boundary effects

Experiments:
1. Hydrological tray {response of a catchment to an event of rainfall}
2. Friction losses in pipes {Verify the head loss equation}
3. Bernoulli's experiment {Flow: turbulent, laminar or transition}
4. Water hammer analysis
5. Flow past a sharp crested weir

Time Table: Lectures (Mon; Thu, 11 – 12, 7/107), Lab (Fri, 14 – 17, 7/107)

1. Mays, L. W., 2011. Water Resources Engineering (3rd Ed), John Wiley & Sons
2. Subramanya, K., 2013. Engineering Hydrology (4th Ed), Tata McGraw-Hill
3. Subramanya, K. 2013. Open Channel Flow, Tata McGraw-Hill
4. Todd, D.K., and Mays, L. W., 2005. Groundwater Hydrology, John Wiley & Sons
5. Linsely, R. K., Paulhus, J. L., and Kohler, M. A.,1982. Hydrology for Engineers, Tata McGraw-Hill
6. Chaudhry, M. H., 2011. Open Channel Flow, Springer