**CE 344 – Water Resources Engineering Lab.**

**Code and Name:** CE 344 – Water resources engineering Lab.
**Credit Hours:** 1 (Lab. / Practical 2Hrs)

**Textbook:**
- Water Resources Engineering: Chin, D.A., 3rd Edition, Pearson, 2013

**Other References:**
- *Mays, L.W., Water Resources Engineering, John Wiley & Sons. 2005*
- *Handouts: distributed from time to time to provide more information on the topic.*

**Course Description:**
Experiments on: properties of fluids; flow measurements; statics of fluids; principles of continuity, Bernoulli, energy, and momentum; viscous effects; free surface flow; and pumps.

**Pre-requisites:** None
**Co-requisites:** CO: CE340 Water Resources Engineering

**Course Learning Outcomes:**
With relation to ABET Student Outcomes (From Fall 2019-SOs: 1-7)

1. Conducting experiments on fluid properties and capillary rise. Centre of pressure on a plane surface, Buoyant stability: floating,
2. Conducting experiments on Bernoulli's Theorem: Venturi tube, Pitot tube, Impact jet, Flow through an orifice and open channels.
3. Demonstrate familiarity with data collected, interpret it and compare it with theories and using computer.
4. Demonstrate the ability to write clear technical lab reports.
5. Work in group and individually with good report with the members of the team.

**Topics to be covered:**
- Introduction to lab. Facilities
- Surface tension and capillarity
- Centre of pressure on a plane surface
- Buoyant stability: floating
- Demonstration for identification of important water properties
- Momentum concept: Impact jet
- Reynolds number
- Bernoulli's Theorem: Venturi tube, Pitot tube
- Single, Series and parallel pumps
- Head loss in pipes
- Open channel: Uniform flow using Manning formula
- Flow measurement in open channel (Weirs)
- Flow through an orifice

**Grading Policy:**
The grading for the course is: 60% coursework and 40% Final Exam. The course work consists of two quizzes (14%) It also includes lab. reports (40%) and class participation (6%).