1. Department, Course Number, and Course Title:

MECHANICAL ENGINEERING

CE/ME313 FLUID MECHANICS LABORATORY I

2. Designation:

Required	☑	Elective	☐
Lower Division	☐	Upper Division	☑

3. Course Description: Experiments on fluid properties, fluid statics, conservation of mass, energy, and momentum, and fluid resistance.

4. Prerequisites: CE/ME 303 (Fluid Mechanics I)

5. Text and Materials: Fluid Mechanics, D.F. Young, B.R. Munson and T.H. Okiishi
Published by John Wiley & Sons, Inc. 2004

6. Course Objectives: The students will learn to conduct experiments to verify fundamental principles of fluid mechanics, calibrate measuring devices, analyze experimental data and develop empirical relations when appropriate.

Course Outcomes

- The ability to conduct experiments for a given purpose.
- The ability to analyze experimental data and develop empirical equations.
- Verification of basic principles and equations of fluid mechanics.
- The ability to use computers for data analysis, empirical equations and presentation.
- The ability to work individually and as a team
- The ability to communicate in written reports and oral presentation.

7. Topics Covered: (in Order of Presentation)

- Orientation. Review of Least Square Method
- Calibration of Pressure Gages &Transducers
- Hydrostatic Force on a Plane Surface
- Buoyancy and Stability
- Verification of Bernoulli Equation
- Calibration of Flow Meters
- Hydrodynamic Force of a Free Jet
- Friction Head Loss in Pipe
- Performance of Impulse Turbine
- Final Examination/Oral presentation

8. Class Schedule:

Number of Sessions per week:	1
Duration of each session:	2 hour 50 minutes

9. Contribution of course to meeting the professional component:

This course is a required laboratory course in the Mechanical Engineering program.

Engineering Laboratory	1 unit

10. Relationship of course to program objectives:

This course relates to the program objectives by contributing to the following measurable outcomes at the level indicated for all engineering graduates:

Knowledge outcomes:

- an ability to apply knowledge of mathematics, science, and engineering (abet a)
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context (abet h)
- a knowledge of measurement techniques

Skill outcomes:

- an ability to design and conduct experiments as well as to analyze and interpret data (abet b)
- an ability to function on multidisciplinary teams (abet e)
- an ability to communicate effectively (abet g)
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (abet k)
- an ability to think in a logical sequential process

Attitudes Outcome:

- an understanding of professional and ethical responsibility (abet f)
- a desire to be a flexible and adaptable team player (collaborative attitude)

11. Prepared by: Chivey Wu 05/2005