MECHANICAL ENGINEERING PROGRAM

ABET COURSE SYLLABUS

ME 380L: Fluid Dynamic Laboratory (1 credit): Required Course

Course Description (2008-2010 Catalog):

Laboratory and computer-based experiments on the dynamics of fluids including pressure in pipes, fluid properties, compressible flows, inviscid flow simulations, boundary layer measurements, usage of wind tunnels, and applications of computational fluid dynamics..

Prerequisite Course: ME 242, MATH 283, PHYS 182-182L.

Prerequisite by Topic:

- Dynamics
- Calculus III
- Physics for scientists and engineering III

Textbook: N/A

Other Reference Material: N/A

Course Coordinator: Hui Zhao, Assistant Professor

Course learning outcomes:

(a) Measure the viscosity, force, flow rate and friction through experiments.
(b) Understand the physical meaning of each measured parameter such as Re number.
(c) Analyze the data, identify and estimate errors and know how to reduce the errors.
(d) Present the results in scientific written reports.

Relationship of Course to Mechanical Engineering Program Educational Outcomes:

Goal1: Provide mechanical engineering graduates with technical capabilities.					Goal 2: Prepare the mechanical engineering graduates to have effective workplace skills.				Goal 3: Instilling a sense of responsibility as a professional member of society.			
1.a	**1.b**	**1.c**	**1.d**	**1.e**	**2.a**	**2.b**	**2.c**	**2.d**	**3.a**	**3.b**	**3.c**	**3.d**
H	**H**	**L**			**H**		**M**	**M**				

(L)ow (M)edium (H)igh

Topics Covered:

1. Determination of fluid temperature, fluid density and fluid viscosity
2. Forces on a sluice gate
3. Determination of the critical Reynolds number
4. Flow rate and pressure measurements
5. Determination of friction factor in pipe flow
6. Developing pump curves using PUMPLAB®

Laboratory Projects: None

Class/Laboratory Schedule: 2 hours and 50 minutes lab every two weeks

Assessment of Student Progress toward Course Objectives

Six written lab reports.

Class/Laboratory Schedule: F 1:00-3:50 PM (Spring Semester)

Contribution of Course for meeting Professional Component:

(a) Mathematics and basic sciences:	0 credit
(b) Engineering Topics (Design/Science):	1 credit
(c) General Education:	0 credit
(d) Others:	0 credit

Prepared By:	Date:
Hui Zhao	September 1, 2009