Course Number	**ME-405**
Course Title	**Mechanical Laboratory II**
Course Structure	(1-2-2) (lecture hr/wk - lab hr/wk – course credits)
Course Coordinator	Dr. A. Harnoy
Course Description	Laboratory emphasizes the use of fundamental principles, and instrumentation systems, for the analysis, and evaluation of mechanical components within a system.
Prerequisite(s)	ME 343 – Mechanical Laboratory I ME 312 – Thermodynamics II
Corequisite(s)	ME 407 – Heat Transfer
Required, elective or selected elective	Required
Required Materials	**a. J.P. Holman, Experimental Methods for Engineers, Seventh Edition, McGraw-Hill**, 2001. **b. Harnoy, A, Mechanical Laboratory II Manual,** Available on ME Dept, NJIT Web
Other supplemental materials (not Required)	c. Beckwith, Marangoni and Lienhard, Mechanical Measurements, Fifth Edition, Addison-Wesley, 1993. d. Beer, A Guide to Writing as an Engineer, 2nd Ed., Wiley ISBN 0-471-43074-9
Computer Usage	Lab report writing, data acquisition.

Course Learning Outcomes/ expected performance criteria:

Course Learning Outcomes	SOs*	Expected Performance Criteria
1 **test** mechanical systems, such as pumps and turbines, in the laboratory	b, c	**Exam Question** (75% of the students will earn a grade of 75% or better on this question)
2. **compare** measured transient heat transfer temperature to that calculated by the theory	a .b, c d	**Exam Question** (75% of the students will earn a grade of 75% or better on this question)
3. **apply** theoretical concepts of	a, b, c,	**Exam Question** (75%

	fluid mechanics, and thermodynamics to analyze the efficiency of pumps and turbines	d, e	of the students will earn a grade of 75% or better on this question)
	4. **produce** experimental graphs using computer data acquisition software.	g, k	**Report** (70% of the students will earn a grade of 75% or better on the report)
	5. **estimate** experimental errors.	a, b, c, e, h	**Exam Question** (75% of the students will earn a grade of 75% or better on this question)
	6. **draw** sketches explaining laboratory machine components,	b, c, g	**Report** (70% of the students will earn a grade of 75% or better on the report)
	7. **write** appropriate technical reports explaining experiments, results and draw conclusions	g	**Report** (80% of the students will earn a grade of 75% or better on the report)
	8. **apply** fluid mechanics concepts to analyze flow around a cylinder in wind tunnel experiments	a b, c, d, e	**Exam Question** (75% of the students will earn a grade of 75% or better on this question)

Class Topics

Topics

1. Introduction to ME laboratory II
2. Performance test of a centrifugal pump.
3. Performance test of a gear pump.
4. Performance test of an impulse turbine (Pelton Wheel Experiment)
5. Wind tunnel experiment of pressure distribution around a cylinder
6. Transient heat conduction in bodies of finite length
7. Presentation/discussion of lab reports
8. Review.

Student Outcomes (Scale: 1-3)

a	b	c	d	e	f	g	h	i	j	k
3	3	3	2	2		2	2			2

3 – Strongly supported 2 – Supported 1 – Minimally supported

* Student Outcomes.