

## MENG 203 - Experimental methods for engineers

<b>Department:</b> Mechanical Engineering		
<b>Program Name:</b> Mechanical Engineering		<b>Program Code:</b> 23
<b>Course Number:</b> MENG203	<b>Credits:</b> 2 Cr	<b>Year/Semester:</b> 2013 - 2014 Fall
<input checked="" type="checkbox"/> Required Course <input type="checkbox"/> Elective Course    (click on and check the appropriate box)		
<b>Prerequisite(s):</b> MENG245		
<b>Catalog Description:</b> To introduce the students to basic concepts (calibration standards, dimensions and units, the generalized measurement .....), Analysis of experimental data, Basic electrical measurements and sensing devices, Displacement and area measurements, Pressure measurement, Flow measurement, The measurement of temperature, Force, torque and strain measurements, Motion and vibration measurement, Report writing and presentations and Design of experiments.		
<b>Course Web Page:</b> <a href="http://me.emu.edu.tr/hacisevki/">http://me.emu.edu.tr/hacisevki/</a>		
<b>Textbook(s):</b> Holman J. P., Experimental methods for engineers, 7 <sup>th</sup> ed., The McGraw-Hill Companies, New York, © 2007.		
<b>Lab Manual:</b> Experimental methods for engineering lab booklet.		
<b>Indicative Basic Reading List :</b> Y. A. Çengel and J. M. Cimbala, <i>Fluid Mechanics: Fundamentals and Applications</i> , McGraw-Hill, New York, 2006.		
<b>Topics Covered and Class Schedule:</b> <b>(2 hours of lectures per week)</b>		
Week 1-2	Introduction and basic concepts (calibration standards, dimensions and units , the generalized measurement )	
Week 3	Report writing and presentations	
Week 4-5	Analysis of experimental data	
Week 6	Displacement and area measurements	
Week 7	Pressure measurement	
Weeks 8-9	<b>Mid-Term Examination</b>	
Week 10-11	Flow measurement	
Weeks 12	The measurement of temperature	
Week 13	Force, torque and strain measurements	
Week 14	Motion and vibration measurement	
Week 15:	<b>Final Examination</b>	

<b>Laboratory Schedule:</b> <b>(3 hours of laboratory per week)</b>	
Week 6	Lab 1: Pressure Calibration

Week 7	Lab 2: flow calibration
Week 8	Lab 3: flow measurements ( flow meter, rotameter, venturi meter)
Week 10	Lab 4: Thermal conductivity measurement
Week 11	Lab 5: Area measurement (Planimeter)
Week 12	Lab 6: Mass balance measurements
Week 3	Lab 7: Stress and strain measurement

**Course Learning Outcomes:**

At the end of the course, student must be able to

- (1) To improved there ability to used all type of Flow measurement, Pressure measurement, Temperature measurement, Force, Torque and strain measurement;
- (2) To improved there ability in writing reports and presented;
- (3) Understand the main formulation methods and the limitations of the equations derived from them;
- (4) Improved there ability to analysis the experimental data;
- (5) Design and conduct an experiment and present there results;
- (6) Improved there ability in dealing with equipment;
- (7) Demonstrate ability to function in design teams;

	Method	No	Percentage
<b>Assessment</b>	Midterm Exam	1	30 %
	Quizzes	4	10 %
	Lab Report (s)	7	20 %
	Final Examination	1	40 %

**Contribution of Course to Criterion 5**

Credit Hours for:

Mathematics & Basic Science : 0

Engineering Sciences and Design : 4

General Education : 0

**Relationship of Course to Program Outcomes**

The course has been designed to contribute to the following program outcomes:

- (a) apply knowledge of mathematics, science, and engineering
- (c) design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- (e) identify, formulate, and solve engineering problems
- (k) use the techniques, skills, and modern engineering tools necessary for engineering practice

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**Date Prepared:** 15 October 2013

**QUIZ Dates**

Number of Quiz	Quiz Dates	Class
Quiz 1	7 / 11 / 2013	ME112
Quiz 2	21 / 11 / 2013	ME112
Quiz 3	12 / 12 / 2013	ME112
Quiz 4	26 / 12 / 2013	ME112