

Alanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering  
**Mechanical Engineering Department**  
 2023-2024 Fall Semester

**Syllabus**

<b>Code/Name</b>	MEC 403 / Mechanical Engineering Laboratory I
<b>Type</b>	Required
<b>Credit/ECTS</b>	2/2
<b>Hour per Week</b>	3 (1+0+2)
<b>Level/Year</b>	Undergraduate/4
<b>Semester</b>	Fall
<b>Classroom</b>	WWW   T206 T206 T206
<b>Content</b>	Health and safety procedures in laboratory. Experimental procedure. Measurement systems. Error analysis and uncertainty. Analysis of experimental data, plotting, curve fitting, and presentation of results in written reports. Experiments on basic fields of mechanical engineering including solid mechanics, material characteristics, fuel characteristics, design and manufacturing, energy, heating and cooling systems, heat transfer, automotive, machine tools, machine theory, machine dynamics, and control.
<b>Prerequisites</b>	MEC 302 Heat Transfer, MEC 303 Fluid Mechanics II
<b>Textbooks</b>	<p><b>Primary</b>                      JP Holman, Experimental Methods for Engineers, 8th Ed., McGraw-Hill, 2012.</p> <p><b>Supplementary</b>                      RS Figliola, DE Beasley, Theory and Design for Mechanical Measurements. John Wiley &amp; Sons, 2012.                      AS Morris, R Langari, Measurement and Instrumentation, 1st Ed., Elsevier, 2012.</p>
<b>Objectives</b>	<ul style="list-style-type: none"> <li>• To operate a broad range of instruments to conduct mechanical experiments</li> <li>• To analyze and to assess experimental data effectively</li> <li>• To prepare laboratory reports with a professional engineering approach</li> </ul>
<b>Course Outcomes</b>	In this course you will be able to: C01 Experiment various processes C02 Deduce how the theory applies to the physical world C03 Analyze experimental data C04 Write professional laboratory reports C05 Distinguish measurement methods C06 Justify the accuracy of experimental results

**Weekly Schedule of Topics**

W	Topic	Laboratory   Experiments
1	Report Writing and Presenting Data	Presentation of the Syllabus, Introduction
2	Calibration, Measurement Systems	Laboratory Rules
3	Modeling Fluid Systems	Machine Shop
4	Flow Measurements	Machine Shop
5	Thermal Measurements	Fluid Mechanics
6	Radiative Temperature Measurements	Fluid Mechanics
7	Electrical Measurements	Fluid Dynamics
8	Sensing Devices	Fluid Dynamics
9	Dynamic Measurements	Fluid Dynamics
10	Zero-, First- and Second-Order Measurement	Mechatronics Laboratory

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Systems		
11	Signals, Transfer Functions, System Response	Mechatronics Laboratory
12	Frequency Spectrum, Fourier Analysis	Mechatronics Laboratory
13	Input/Output Concept	Renewable Energy
14	Data Acquisition Systems	Renewable Energy

**Professional Contribution** Ability to design experiments, acquire data, evaluate data, compare, and interpret experimental results with analytical and/or computational models

**Contribution to Program Outcomes\***

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	4	5	4	1	4	3	3	1	4	3
CO2	5	4	5	5	2	5	4	5	2	4	4
CO3	4	4	5	4	0	4	3	3	1	4	2
CO4	3	3	5	4	2	5	5	3	3	3	5
CO5	3	4	5	4	4	4	2	3	0	2	3
CO6	5	5	5	5	4	5	4	4	1	5	4

\* Contribution Level | 0: None | 1: Very Low | 2: Low | 3: Medium | 4: High | 5: Very High

**Special Conditions**

- Students work in groups.
- Experimental studies are reported using MS Word equation editor or Latex.
- The laboratory reports are presented, as well.
- A minimum of 80% attendance rule for the labs will be applied.
- The consequence of violation of the attendance rule is to receive a grade of **DZ**.

**Requirements** Basic knowledge of Matlab; Knowledge of MS Word Equation Editor or Latex

**Course Policy**

1. You must attend at least 70% of the sessions including add-drop period.
2. Be in the class on time.
3. English should always be used to communicate with one another.
4. Mobile phones should be switched off and put away during the class.
5. You cannot talk to your friends during class no matter what the subject is.
6. Please be prepared by reviewing the assigned readings and laboratory notes.

**Cheating & Plagiarism**

- Copying or letting someone copy your work on exams, assignments, or reports is cheating.
- Cutting and pasting text, figures and tables from web sources or any other electronic source is plagiarism.
- The consequence of academic dishonesty is to receive a grade of **FF** for the course.

**Evaluation**

Laboratory	60%
Midterm Exam	20%
<u>Final Exam</u>	20%
Total	100%

**Rubric** A rubric will be announced prior to experimental sessions. The rubric has 3 main parts for the grading: writing performance (20%), technical assessment (60%) presentation performance (20%)

**Instructor**

Name/Surname	Akın Oktav	Email	akin.oktav@alanya.edu.tr
Room	209	Office Hours	W 10:30-11:30   Th 16:15-17:15