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

Syllabus

Code/Name	MEC 404 / Mechanical Engineering Laboratory II
Type	Required
Credit/ECTS	2/2
Hour per Week	3 (1+0+2)
Level/Year	Undergraduate/4
Semester	Spring
Classroom	FFF | D204
Content	This course continues from MEC 403. 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. Analysis of experimental data, plotting, curve fitting, and presentation of results in written reports
Prerequisites	MEC 403 Mechanical Engineering Laboratory I
Textbooks	***Primary*** JP Holman, Experimental Methods for Engineers, 8th Ed., McGraw-Hill, 2012. ***Supplementary*** RS Figliola, DE Beasley, Theory and Design for Mechanical Measurements. John Wiley & Sons, 2012. AS Morris, R Langari, Measurement and Instrumentation, 1st Ed., Elsevier, 2012.
Objectives	• To operate a broad range of instruments to conduct mechanical experiments • To analyze and to assess experimental data effectively • To prepare laboratory reports with a professional engineering approach
Course Outcomes	In this course you will be able to: CO1 Experiment various processes CO2 Deduce how the theory applies to the physical world CO3 Analyze experimental data CO4 Write professional laboratory reports CO5 Distinguish measurement methods CO6 Justify the accuracy of experimental results

Weekly Schedule of Topics

W	Topic	Laboratory | Experiments | Discussions
1	Syllabus & Orientation	Air-Conditioning | experiment
2	Electrical Measurements	Air-Conditioning | discussion
3	Sensing Devices	Cooling Cycle | experiment
4	Amplifiers	Cooling Cycle | discussion
5	Transducers	Linkage Set | experiment
6	Force Measurement	Linkage Set | discussion
7	Torque Measurement	Heat Transfer | experiment
8	Motion Measurement	Heat Transfer | discussion
9	Vibration Measurement	Bending of Beams | experiment
10	Vibration Measurement	Bending of Beams | discussion

11	Acoustic Measurement	Vibration | experiment
12	Frequency Spectrum, Fourier Analysis	Vibration | discussion
13	Data Acquisition Systems	Gas Turbine | experiment
14	Data Processing	Gas Turbine | discussion

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.
Requirements	Basic knowledge of Matlab; Knowledge of MS Word Equation Editor or Latex
Course Policy	• Be in the class or laboratory on time. • English should always be used to communicate with one another. • Please be prepared by reviewing the assigned readings and laboratory notes. • At least **80%** attendance is required, otherwise a grade of **DZ** will be assigned. • You must be present in class for the presentations, otherwise you will not be graded for the presentation.
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 (7×10 pts.) 70% Midterm Exam 15% Final Exam 15% Total 100%
Rubric	A rubric will be announced prior to experimental sessions. The rubric has 3 main parts for the grading: writing performance, technical assessment, presentation performance.

Instructor

Name/Surname	Akın Oktav	Email	akin.oktav@alanya.edu.tr
Room	209	Office Hours	W 11.30-12.30 | F 13.30-14.30

Prepared by Akın Oktav on February 5th, 2024