AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Electrical Measurement and Instrumentation								
Course Code	EEE562		Couse Level	Second Cycle (Master's Degree)					
ECTS Credit	8	Workload	200 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	This course aims to teach fundamental and modern electrical measurement and instrumentation techniques.								
Course Content	Measurement methods, errors, sensitivity, reliability, and safety concepts, sensor technologies and calibration of sensors, data acquisition techniques, fundamental noise suppression techniques, noise and signal processing, applications on measurement of some electrical, mechanical, and radioactive quantities, Data loggers and recording, displaying, and processing of measured signals, intelligent measurement systems and real time measurement (RTM).								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Demonstration, Discussion, Case Study, Project Based Study, Individual Study, Problem Solving								
Name of Lecturer(s)	Assoc. Prof. Coşkun DENİZ								

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	30
Final Examination	1	30
Assignment	4	20
Project	1	20

Recommended or Required Reading

1	A. S Morris, Measurement and Instrumentation Principles, 3rd/e, Butterworth Hienemann, 2001.
2	D. A. Bell, Electronic Instrumentation and Measurements 2nd/e, Oxford Press, 2007.
3	S. Tumanski, Principle of Electrical Measurement, Taylor & Francis, 2006.
4	I. Gertsbakh, Measurement Theory for Engineers, Springer, 2010.
5	W. Bolton, “Electrical and Electronic Measurement and Testing”, Longman Scientific and Technical, 1992.
6	Lecture notes and lab instructions.

Week	Weekly Detailed Course Contents	
1	Theoretical	Fundamentals of measurement, physical quantities, error analysis; sensitivity, reliability, and safety concepts
2	Theoretical	Instrument types and performance characteristics
3	Theoretical	Measurement of electrical quantities
4	Theoretical	Sensor technologies, commonly used modern sensors and transducers
5	Theoretical	Instrumentation amplifier and applications
6	Theoretical	Measurement, noise and signal processing techniques
7	Theoretical	PLL (Phase Locked Loop) and noise suppression techniques
8	Intermediate Exam	Midterm Exam
9	Theoretical	Analog/Digital computers and applications
10	Theoretical	Real time measurement techniques and Intelligent devices
11	Theoretical	Displaying, recording and processing of measurement data
12	Theoretical	Calibration of measuring sensors and devices
13	Practice	Lab Application#1: Measurement and instrumentation of electrical quantities
14	Practice	Lab Application#2: Measurement and instrumentation of mechanical quantities
15	Practice	Lab Application#3: Measurement and instrumentation of radioactive quantities
16	Final Exam	Final Exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	4	3	98

Assignment	4	10	3	52
Project	1	11	3	14
Midterm Examination	1	15	3	18
Final Examination	1	15	3	18
			Total Workload (Hours)	200
			[Total Workload (Hours) / 25*] = **ECTS**	8
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	To be able to measure physical quantities, such as displacement, velocity, acceleration, heat, time, radioactivity, etc., and analyze the errors during measurements
2	To be able to understand the fundamental measurement and instrumentation techniques
3	To learn calibration of sensors, instrumentation amplifiers, and noise suppression techniques and be able to design measurement devices for physical quantities
4	To learn Analog/Digital computers and Real Time Measurement (RTM) techniques regarding intelligent measurement systems
5	To be able to measure the fundamental electrical, mechanical, and radioactive quantities with gained knowledge on the instrumentation by RTM applications

Programme Outcomes *(Electrical and Electronics Engineering Master)*	
1	Developing and intensifying knowledge that requires expertise in the area of Electrical-Electronics Engineering, and gaining the skills necessary to analyze and solve problems using this knowledge
2	Grasping the inter-disciplinary interaction related to Electrical-Electronics Engineering, interpreting and forming new types of knowledge by combining the knowledge from Electrical-Electronics Engineering and the knowledge from various other disciplines
3	Developing new approaches to solve the complex problems arising in Electrical-Electronics Engineering, coming up with solutions while taking responsibility and carrying out a specific study independently
4	Assessing the knowledge and skill gained in the area of Electrical-Electronics Engineering with a critical view
5	Transferring the current developments and one’s own work in Electrical-Electronics Engineering, to other groups in written, oral and visual forms
6	The ability to control the collecting, interpreting, practicing and announcing processes of the Electrical-Electronics Engineering related to data taking into consideration scientific, cultural and ethical values and the ability to teach these values to others
7	Developing application plans concerning the subjects related to Electrical-Electronics Engineering and the ability to evaluate the end results of these plans within the frame of quality processes

Contribution of Learning Outcomes to Programme Outcomes *1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High*

	L1	L2	L3	L4	L5
P1	4	4	4	4	4
P2	4	4	4	4	4
P3	4	4	4	4	4
P4	4	4	4	4	4
P5	4	4	4	4	4
P6	4	4	4	4	4
P7	4	4	4	4	4