AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title		Process Measurements							
Course Code		MTR222		Couse Level		Short Cycle (Associate's Degree)			
ECTS Credit	3	Workload	72 *(Hours)*	Theory	2	Practice	1	Laboratory	0
Objectives of the Course		Students should be able to realize how to follow scientific research methods, techniques of data collection and reporting.							
Course Content		Science and basic concepts (facts, knowledge, absolute, accurate, false, universal knowledge), basic knowledge related to science history, the structure of scientific researches, scientific methods and different perspectives related to these methods, problem, research design, population and sample, the collection of data, data collection methods (quantitative and qualitative research methods), analysis of data, explanation of data and reporting.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Demonstration					
Name of Lecturer(s)									

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	60

Recommended or Required Reading	
1	Ders notu

Week	Weekly Detailed Course Contents	
1	Theoretical	Definitions of instrument, sensor, measurement, process and process control. Basic fields of application of instrumentation.
2	Theoretical	Explanation of and basic calculations on performance parameters of sensors. Basic elements in a closed control loop and emphasizing the importance of measurement in process control.
3	Theoretical	An understanding of on-off and PID control. PID control experiments using a digital controller.
4	Theoretical	Operating principles and technical data of position sensors.
5	Theoretical	Operating principles of and a comparative study on potentiometer, inductive and LVDT displacement transducers and encoders.
6	Theoretical	Basic concepts of pressure measurement. Gage and vacuum pressure manometers.
7	Theoretical	Operating principles and technical data of bellows, diaphragm and Bourdon tube elastic pressure transducers.
8	Theoretical	Operating principles and technical data of bellows, diaphragm and Bourdon tube elastic pressure transducers.
9	Theoretical	Methods and signal conditioning circuits used to obtain electrical output from elastic pressure transducers by displacement transducers and strain gages.
10	Theoretical	Operating principles of piezo-resistive and piezo-electrical pressure transmitters and industrial fields of application.
11	Theoretical	Vacuum pressure classification and operating principles of vacuum measuring devices.
12	Theoretical	Basic definitions and types of strain gages, and the measuring circuits
13	Theoretical	Operating principles and technical data of a.c., d.c., variable reluctance and optical tachometers used to measure angular velocity.
14	Theoretical	Basic definitions of acceleration measurement and operating principles of practical acceleration transducers

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	1	2	42
Lecture - Practice	14	1	1	28
Midterm Examination	1	0	1	1

Final Examination	1	0	1	1
			Total Workload (Hours)	72
			[Total Workload (Hours) / 25*] = **ECTS**	3
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	To have an understanding of the importance of measurement and instrumentation in industrial processes.
2	To gain an ability to use digital controllers and tune PID parameters
3	To be able to identify the principle operation and types of position sensors/transducers.
4	To have an understanding of pressure and vacuum measurements and identify manometers and to gain an ability to use and tune pressure measuring instruments.
5	To have an understanding of strain gages, to be able to measure weight, force and pressure using load cells.
6	To be able to identify the principle operation of speed, acceleration and vibration measurements and have an understanding of the measuring devices.
7	To be able to analyze technical data of the instruments and apply to the related process.
8	To be able to use and tune instruments as a part of a team, and write reports for the experiments

Programme Outcomes *(Mechatronics)*	
1	TECHNICAL FOREIGN LANGUAGE
2	BASICS OF MECHATRONICS
3	TECHNICAL DRAWING
4	DOING BASIC MECHANIC PROSESES
5	CHOOSE THE MATERIALS
6	DOING MECHANICAL SYSTEM DESIGN
7	SET UP A HYDRAULİC OR PNEUMATICSYSTEMS
8	DOING COMPUTER AIDED MECHANICAL DESİGN
9	USINGFLEXIBLE PRODUCING SYSTEMS
10	USINGCOMPUTER AIDEDMACHINE TOOLS
11	DOING ELECTRICAL AND ELECTRONICAL
12	SET UP ELECTRICAL AND ELECTRONICAL CIRCUITS
13	SET UP LOGICAL CIRCIUTS
14	DOING COMPUTER AIDED ELECTRONICAL CIRCUITSDESİGN
15	SET UP ELECTRICAL MOTORS
16	SET UP MICROCONTROLLER CIRCIUTS
17	SET UP CONTROL SYSTEMS
18	COMMUNICATE CONTROL SYSTEMS
19	DOING INDUSTRIAL ROBOTIC PROGRAMMINGAND MAINTENANCE
20	WRITING COMPUTER PROGRAMME
21	Ability to use the methods and techniques of career planning and discussing the effects of character traits on career preferences.
22	Ability to plan a career in their own profession.

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

	L1	L2	L3	L4	L5	L6	L7	L8
P11	5	5	5	5	5	5	5	5
P12	5	5	5	5	5	5	5	5