



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Automation in Agriculture							
Course Code		ZTM601		Course Level		Third Cycle (Doctorate Degree)			
ECTS Credit	7	Workload	175 (<i>Hours</i>)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		The aim of this course, to inform about measurement methods and devices. To give knowledge about automatic control circuits, devices, procedures used during the control variables and components, control types, measurement and final control elements properties and units, the static and dynamic operating characteristics, agricultural techniques in the greenhouse, food technology, animal production and storage.							
Course Content		Tarımda otomasyon sistemleri ve uygulamaları . Ölçme sistemlerinde hatalar ve nedenleri, ölçme sonuçlarının değerlendirilmesi, ölçme sistemleri ve dinamik ölçme sistemlerinin temeli •Ölçme sistemlerinin fonksiyonları ve kullanımı (strain gauge, recorder ve diğer data toplama değerlendirme sistemleri) •Algılayıcılar, algılama aralıkları ve duyarlılık •Dönüştürücülere ilişkin temel uygulamalar •Farklı algılayıcılar ve uygulamaları (basınç, sıcaklık, ısı, boyut, akış, ışık, ışıınım, hareket ve titreşim, tork, güç vb.) •Otomatik kontrol kavramı, kontrol sistemleri ve türleri •Temel kavramlar ve tanımlar ile kontrol sistemlerinin yapısı ve kullanım alanları •Sistemlerin davranış biçimleri ve endüstriyel kontrol sistemlerinin çalışması •Tarım tekniği içinde otomatik kontrol uygulamalarına ilişkin örnekler (sera, gıda teknolojisi) Tarım tekniği içinde otomatik kontrol uygulamalarına ilişkin örnekler (sera, gıda teknolojisi, hayvansal üretim,depolama, sulama)							
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	30
Final Examination	1	70

Recommended or Required Reading

1	Yüksel, İ. (1997). Automatic Control System Dynamics and Control Systems. Uludağ University, Bursa
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Week	Weekly Detailed Course Contents	
1	Theoretical	Course description, explanation of topics, activities, evaluation methods and the functioning.
2	Theoretical	The evaluation of the size by the unit in measuring technique Systematic detection of error rate and establishment of measurement, the SI unit system and applications,
3	Theoretical	The errors and causes in the measurement systems, evaluation of measuring results, measuring systems and the foundation of a dynamic measurement system
4	Theoretical	Graphical curve adjustment, the basic electrical measurements and sensitive elements
5	Theoretical	Functions of measurement systems and their usage (strain gauges, recorders and other data collection and evaluation system
6	Theoretical	Sensors, sensing range and sensitivity
7	Theoretical	The basic converter applications.
8	Theoretical	Different sensors and applications (Temperature, pressure, size, flow, light, radiation, motion and vibration, torque, power, etc.).
9	Theoretical	Different sensors and applications (Temperature, pressure, size, flow, light, radiation, motion and vibration, torque, power, etc.).
10	Theoretical	The concept of automatic control, control systems and types.
11	Theoretical	Basic concepts, definitions and application fields and structure of control systems.
12	Theoretical	The operation type of industrial control systems and behaviors of the systems.
13	Theoretical	Examples of automatic control applications in agriculture (greenhouses, food technology)
14	Theoretical	Examples of automatic control applications in agriculture (greenhouses, food technology)

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	5	3	112
Assignment	5	5	5	50



Midterm Examination	1	5	3	8
Final Examination	1	3	2	5
Total Workload (Hours)				175
[Total Workload (Hours) / 25*] = ECTS				7
*25 hour workload is accepted as 1 ECTS				

Learning Outcomes

1	To recognize of different type of measurement tools and to Select appropriate measurement tools
2	To understand the types of mechanical and electrical automatic control systems.
3	The basic converter applications.
4	Different sensors and applications (Temperature, pressure, size, flow, light, radiation, motion and vibration, torque, power, etc.).
5	Examples of automatic control applications in agriculture (greenhouses, food technology)

Programme Outcomes (Agricultural Machinery Doctorate)

1	Identification, formulation and solving the problems in the field of Agricultural Machinery
2	The ability to use modern engineering tools and techniques
3	The ability to use the information, which is obtained by following the scientific and technological developments, in the academic life and practice.
4	The ability to evaluate multi-faced relationship between them by understanding interaction among agricultural technology, soil, plants and animals
5	Professionalism and ethical responsibility
6	The ability to work in disciplinary and multi-disciplinary teams
7	The ability to communicate effectively
8	The ability to do research for accessing information and to use data base and other resources
9	The ability to do analyze and interpret the experimental results and the design of experiment
10	The ability to identify and interpret knowledge of current professional issues and events
11	The ability to get aware the universal and social effects of engineering solutions and applications
12	Accordance with the requirements of science and technology, ability to use scientific knowledge creative

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

	L1	L3
P2	4	5
P4		5
P5	4	
P8		5

