



## AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		System Theory and Control							
Course Code		MME627		Couse Level		Third Cycle (Doctorate Degree)			
ECTS Credit	9	Workload	231 ( <i>Hours</i> )	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		Teaching the principles, components, and design techniques of industrial control and automation systems, and initiating research studies in this area							
Course Content		Introduction to automation systems. Components of automation. Role of automation in manufacturing systems. Architecture of Industrial Automation Systems. Sensors and measurement systems. PLCs and Programmings. SCADA systems. Applications.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Demonstration, Discussion, Individual Study, Problem Solving					
Name of Lecturer(s)									

### Prerequisites & Co-requisites

Language Requisite	Yes
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### Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	15
Final Examination	1	60
Quiz	4	15
Assignment	5	5
Term Assignment	1	5

### Recommended or Required Reading

1	Petruzella, F.D., 2005. "Programmable Logic Controllers". McGraw-Hill, 3rd Edition. Hugh Jack, "Automating Manufacturing Systems with PLCs", Version 6.0, 2009.
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Week	Weekly Detailed Course Contents	
1	Theoretical	Introduction to automation systems. Components of automation.
2	Theoretical	Role of automation in manufacturing systems.
3	Theoretical	Architecture of Industrial Automation Systems
4	Theoretical	Sensors and measurement systems.
5	Theoretical	PLCs and Programmings
6	Theoretical	Timers, Counters
7	Theoretical	Interrupts, Compare operations
8	Intermediate Exam	Midterm Exam
9	Theoretical	Special Function Memory Adresses
10	Theoretical	Introduction to Vijeo citect program, Vijeo citect Project management, communication settings, creating graphics
11	Theoretical	Commands and controls, genies
12	Theoretical	Creating Pop-up pages, creating log records, event definitions
13	Theoretical	Creating Alarm,process analyst and trend pages
14	Theoretical	Report Pages, SCADA security settings, creating multi-language projects
15	Theoretical	Applications
16	Final Exam	Final Exam

### Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	0	3	42
Assignment	5	8	1	45



Project	1	0	42	42
Laboratory	14	0	3	42
Individual Work	10	0	2	20
Midterm Examination	1	0	20	20
Final Examination	1	0	20	20
Total Workload (Hours)				231
[Total Workload (Hours) / 25*] = <b>ECTS</b>				9
*25 hour workload is accepted as 1 ECTS				

### Learning Outcomes

1	The student will be able to plan and implement automation systems
2	The student will be able to learn SCADA system and its software
3	The student will be able to learn programming of Programmable Logic Controllers
4	To understand the system theory
5	To understand control theory

### Programme Outcomes (Mechanical Engineering (English) Doctorate)

1	1. In Mathematics, natural sciences and mechanical engineering, department has the sufficient infrastructure; the ability to use the theoretical and practical information for engineering solutions
2	2. The ability to identify, define, and solve the formula for complex engineering problems; the ability to select and apply for the appropriate analytical methods and modelling techniques
3	3. To meet desired needs of a system, system component, or process, analysing and designing skill under realistic constraints; in this respect, the ability to apply the methods of modern design
4	4. The ability to use and choose modern techniques and tools for required engineering applications and; the ability to use information technology effectively
5	5. The ability to design the experiment, collect the data for the experiment and interpret to analysing results
6	6. The ability to use computer software and hardware information, access to information and other information sources
7	7. The ability to work individually and with multidisciplinary teams effectively, taking responsibility self-confidence for complex situations
8	8. The ability to communicate with foreign colleagues by having high level of foreign language knowledge in the field of engineering
9	9. Monitoring the science and technology developments and the ability to renew itself with innovative ideas constantly
10	10. Professional and ethical responsibility awareness
11	11. Having an adequate information and awareness in the subjects of occupational safety, occupational health, social security rights, quality control and management issues of environmental protection
12	12. The ability to appreciate the effects of engineering solutions and applications in universal and social dimensions
13	13. The ability to be enlightened to the experts or non-expert audience groups on the issues related with engineering problems and solutions written and oral
14	14. The ability to have adequate knowledge and skills in the project development and application, manage the activities planning, including the projects to the employees having the responsibility of the project by increasing vocational awareness

### 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	5	5	3	3
P2	4	4	4	4	4
P3	4	5	5	5	5
P4	5	5	5	4	3
P5	4	5	4	5	4
P6	3	3	3	4	5
P7	4	4	4	5	3
P8	5	5	5	5	4
P9	3	3	3	4	5
P10	4	4	4	3	3
P11	5	5	5	4	4
P12	3	3	3	5	5
P13	4	4	4	4	5
P14	5	5	5	4	4

