

MODERN CONTROL SYSTEMS

1	Course Title:	MODERN CONTROL SYSTEMS	
2	Course Code:	MAK6237	
3	Type of Course:	Optional	
4	Level of Course:	Third Cycle	
5	Year of Study:	1	
6	Semester:	1	
7	ECTS Credits Allocated:	6.00	
8	Theoretical (hour/week):	3.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	None	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. ELİF ERZAN ERZAN TOPÇU	
15	Course Lecturers:	Dr. Öğretim Üyesi Gürsel ŞEFKAT	
16	Contact information of the Course Coordinator:	erzan@uludag.edu.tr	
17	Website:		
18	Objective of the Course:	To examine the essential knowledge and skills that provide an understanding of the subject and functions of modern control systems with mathematical relations and simulation studies and to gain skills in related subjects	
19	Contribution of the Course to Professional Development:	Know the basic concepts and definitions of modern control system design. Know about control system design. Sliding mode control, fuzzy logic, etc., know intelligent control systems.	
20	Learning Outcomes:		
		1	Learn the basic concepts and definitions of the modern control system.
		2	Know about control system design.
		3	Know know intelligent control systems such as sliding mode control, fuzzy logic, etc.,
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21	Course Content:		
		Course Content:	
Week	Theoretical	Practice	
1	Introduction to modern control systems		
2	State Space Representation		

3	Establishing state space models for linear time-invariant systems			
4	Controllability, Stability and Observability			
5	Optimal Control, LQR, Compensator design			
6	Forward and feedback controller design for linear time-invariant systems			
7	Forward and feedback controller design for linear time-invariant systems (continued)			
8	Controller design with root locus and frequency response methods			
9	Artificial Neural Networks (ANN), Genetic Algorithms (GA)			
10	Sliding mode controller design			
11	Sliding mode controller design (continued) / Image Processing			
12	Fuzzy logic controller design			
13	Fuzzy logic controller design (continued)			
Activites		Number	Duration (hour)	Total Work Load (hour)
22	Textbooks, References and/or Other Materials:	Klasik ve Modern Kontrol Sistemi tasarımı, M. C. ERKAN Tabii 2022	3.00	42.00
Practicals/Labs		0	0.00	0.00
Self study and preperation		İbrahim YUKSEL, 12. Baskı, Dora 2021. Dorf and Bishop "Modern Control Systems" 2008 11	3.00	42.00
Homeworks		0	0.00	0.00
Projects		Modern Control Engineering, K. Ogata, Prentice Hall, 2002	0.00	0.00
Field Studies		0	0.00	0.00
Midterm exams		Çözümlü Problemleri, İbrahim YUKSEL, Mesut SENGİRGİN Gürsel SEFKAT 4 Baskı Dora 2016	0.00	0.00
Others		0	0.00	0.00
Final Exams		İbrahim YUKSEL, 5. Baskı, Dora 2017.	96.00	96.00
Total Work Load				180.00
Total work load/ 30 hr				6.00
TERM LEARNING ACTIVITIES		NUMBE	WEIGHT	
ECTS Credit of the Course				6.00
Midterm Exam		1	20.00	
Quiz		0	0.00	
Home work-project		3	20.00	
Final Exam		1	60.00	
Total		5	100.00	
Contribution of Term (Year) Learning Activities to Success Grade		40.00		
Contribution of Final Exam to Success Grade		60.00		
Total		100.00		
Measurement and Evaluation Techniques Used in the Course		Exam, homework and presentation		
24	ECTS / WORK LOAD TABLE			

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	4	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0
ÖK2	4	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
ÖK3	4	1	3	0	0	0	2	0	0	0	0	0	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	1 very low			2 low			3 Medium			4 High			5 Very High			