

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:	Doç. Dr. Gürsel ŞEFKAT	
16	Contact information of the Course Coordinator:	Prof. Dr. Elif ERZAN TOPÇU e-posta: erzan@uludag.edu.tr Telefon: 0224 294 19 90 Adres: Bursa Uludağ Üniversitesi Mühendislik Fakültesi Makine Mühendisliği Bölümü Görükle/BURSA	
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	
Activites		
12	Fuzzy logic controller design (continued)	
13	Practicals/Labs	
14	Self study and preperation	
15	Homeworks	
16	Projects	
17	Field Studies	
18	Midterm exams	
19	Others	
20	Final Exams	
21	Total Work Load	
22	Total work load/ 30 hr	
23	ECTS Credit of the Course	
23	Assesment	
TERM LEARNING ACTIVITIES		
	NUMBE R	WEIGHT
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				