AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title		Modern Control Analysis and Design With Matlab							
Course Code		EEE524		Couse Level		Second Cycle (Master's Degree)			
ECTS Credit	8	Workload	200 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		The aim of this course is to present analysis and design of modern control systems using MATLAB.							
Course Content		Introduction to MATLAB. Mathematical models of systems. Performance and stability analysis of control systems. Time domain analysis. Root locus method. Frequency response methods. Stability analysis in frequency domain. Control system design. PID, Lag and Lead controllers. State space methods. Robust control systems and SIMULINK applications.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Demonstration, Discussion, Case Study, Project Based Study, Individual Study, Problem Solving					
Name of Lecturer(s)									

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	30
Final Examination	1	30
Assignment	4	20
Project	1	20

Recommended or Required Reading	
1	Modern Control Engineering, Katsuhiko Ogata, Prentice Hall.
2	Modern Control Systems, Richard C. Dorf, Robert H. Bishop, Prentice Hall.
3	R. H. Bishop, Modern Control Systems Analysis and Design Using MATLAB, Addison-Wesley, 1997.
4	Ashish Tewari, Modern Control Design with MATLAB and SIMULINK, John Wiley, 2002
5	Analysis and Design of Control Systems using MATLAB; Rao V. Dukkipati.

Week	Weekly Detailed Course Contents	
1	Theoretical	Introduction to MATLAB
2	Theoretical	Mathematical models of control systems
3	Theoretical	Performance and stability analysis of control systems
4	Theoretical	Time domain characteristics
5	Theoretical	Linear systems
6	Theoretical	Root locus method
7	Theoretical	Frequency response methods
8	Intermediate Exam	Midterm exam
9	Theoretical	Stability analysis in frequency domain
10	Theoretical	Control system design, PID, Lag and Lead controllers
11	Theoretical	PID, Lag and Lead controllers
12	Theoretical	State space methods
13	Theoretical	Robust control
14	Theoretical	SIMULINK applications and case studies
15	Theoretical	SIMULINK applications and case studies
16	Final Exam	Final Exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	4	3	98
Assignment	4	10	3	52
Project	1	11	3	14
Midterm Examination	1	15	3	18

Final Examination	1	15	3	18
			Total Workload (Hours)	200
			[Total Workload (Hours) / 25*] = **ECTS**	8

**25 hour workload is accepted as 1 ECTS*

Learning Outcomes	
1	To learn mathematical modeling of control systems using Matlab
2	To learn the stability and performance analysis of control systems using Matlab
3	To Learn controller design using Matlab
4	To learn state space analysis and design using Matlab
5	To learn the analysis and design of modern control systems using Matlab

Programme Outcomes *(Electrical and Electronics Engineering Master)*	
1	Developing and intensifying knowledge that requires expertise in the area of Electrical-Electronics Engineering, and gaining the skills necessary to analyze and solve problems using this knowledge
2	Grasping the inter-disciplinary interaction related to Electrical-Electronics Engineering, interpreting and forming new types of knowledge by combining the knowledge from Electrical-Electronics Engineering and the knowledge from various other disciplines
3	Developing new approaches to solve the complex problems arising in Electrical-Electronics Engineering, coming up with solutions while taking responsibility and carrying out a specific study independently
4	Assessing the knowledge and skill gained in the area of Electrical-Electronics Engineering with a critical view
5	Transferring the current developments and one’s own work in Electrical-Electronics Engineering, to other groups in written, oral and visual forms
6	The ability to control the collecting, interpreting, practicing and announcing processes of the Electrical-Electronics Engineering related to data taking into consideration scientific, cultural and ethical values and the ability to teach these values to others
7	Developing application plans concerning the subjects related to Electrical-Electronics Engineering and the ability to evaluate the end results of these plans within the frame of quality processes

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	3	4	4	4	4
P2	4	4	4	4	4
P3	3	3	3	3	4
P4	4	4	4	3	4
P5	3	3	3	4	4
P6	3	4	4	3	4
P7	4	3	4	4	4