EUROPEAN UNIVERSITY OF LEFKE

Electrical and Electronics Engineering, Faculty of Engineering

SYLLABUS

2019-2020 Spring Semester

Course Code	Course Name	Course Type	Weekly Course Hours			Credits	ECTS	Weekly Time Schedule
			T	A	L			
EE322	Control Systems	Major	3	0	0	3	5	Friday @ 09:00-11:50; AS-113
Prerequisite		Prerequisite to						

Course Lecturer	Soydan Redif	Office Hours Schedule	On instructor's timetable.
E-mail			
Phone		Office / Room No	AS-314
Teaching Assistant	Ahmet Yasli	Phone	3504
E-mail	ayasli@eul.edu.tr	Office / Room No	

Catalogue Descriptions	Open loop and closed loop control. Transfer function, block diagram, signal flow graph, state equations. Sensitivity, disturbance rejection, steady-state error. Second- and first-order system performance, dominant roots, steady-state error of feedback systems. Routh-Hurwitz criterion, relative stability. Root locus method. Bode diagram, Nyquist stability criterion, gain margin and phase margin. PI, PD and PID controller design.
Course Objectives	To establish the concept of the general processes involved in the design and analysis of linear control systems. Having successfully completed the module, the student will be able to: (i) Obtain the mathematical model and/or transfer function of linear control systems; (ii) Apply time and frequency domain techniques for the analysis of linear systems; (iii) Use the control point of view to analyse problems arising in other disciplines. Course material will be complemented with in-class MATLAB demonstrations.
Learning Outcomes	On successful completion of the course, students should understand: (1) mathematical modelling of linear control systems, e.g. transfer functions, (2) the theoretical tools required for basic control system analysis, (3) techniques for stability analysis of control systems, (4) frequency domain techniques for the analysis of linear systems.
Textbooks	1 R. C. Dorf and R. H. Bishop, Modern Control Systems 13th Ed, Pearson - Prentice Hall 2016. ISBN: 0134407628 2 N. S. Nise, Control Systems Engineering, 3rd Ed., John Wiley & Sons, 2014. ISBN: 1118170512

WEEK	Date	TOPICS	Reference No - Section
Week 1	18/02/2020	Open loop and closed loop control	1: 1.1-1.8
Week 2	25/02/2020	Modeling: integro-differential equations; examples in MATLAB	1: 2.1-2.4
Week 3	03/03/2020	System block diagram description	1: 2.5-2.9
Week 4	10/03/2020	Signal flow graphs, state space equations	1: 3.1-3.4
Week 5	17/03/2020	Laplace transform and transfer functions	1: 3.3; 3.5-3.7
Week 6	24/03/2020	Laplace transform and transfer functions; examples in MATLAB	1: 4.1-4.4;4.6
Week 7	31/03/2020	Feedback control system performance	1: 5.1-5.4
Week 8	07/04/2020	Feedback control system characteristics: steady-state, type.	1: 5.2; 5.5-5.6; 5.9
Week 9	11-18/04/2020	**Midterm Week**	-
Week 10	21/04/2020	Root locus method - introduction	1: 6.4-6.6
Week 11	28/04/2020	Root locus method - system stability analysis; examples in MATLAB	1: 7.1-7.3
Week 12	05/05/2020	Frequency response methods: Bode diagram and Nyquist stability criterion	1: 7.3; 7.6-7.8
Week 13	12/05/2020	Frequency response methods: Nyquist stability criterion; examples in MATLAB	1: 8.1-8.3
Week 14	19/05/2020	Frequency response methods: Nyquist stability criterion; examples in MATLAB	1: 8.1-8.3
Week 15	28-07/05-06/2020	**Final Exam Week**	-