ECE 3510

A. Stolp

Tentative

11/09/22

Fall 2022 COURSE SCHEDULE

Week		Date	lect	Topics	Books: Bodson	Books: Nise
1	T	08/23	1	Syllabus, etc. Servo, Introduction to Feedback Systems, Block diagrams Transfer functions and signals	Ch.1	Ch.1
	Th	08/25	2	The Laplace transform, Transforms of signals, Relationship between pole locations and signal shapes	2.1	2.1 - 2
2	T	08/30	3	Inverse of Laplace transforms using partial fraction expansions	2.2	2.2
	Th	09/01	4	Inverse Laplace transforms using mixed method, Finish Ch.2, Transfer functions	2.2 - 3	2.2
3	M	09/05		Labor Day		
3	T	09/06	5	Transfer functions, Systems, Feedback system, Circuits	3.1	2.3, 5.1-2
	Th	09/08	6	General interconnected systems, BIBO stability, Impulse and Step responses	3.1 - 2	2.4, 4.1-3
4	T	09/13	7	Step responses, 2nd order, % overshoot, effect of zeros	3.3	4.4 - 8
	Th	09/15	8	Responses to sinusoidal inputs, Sinusoidal steady-state	3.4	notes
5	T	09/20		Exam 1		
	Th	09/22	9	Responses to sinusoidal inputs, Effect of initial conditions, State-space advantages	3.5-6, 4.4	Ch.3
6	T	09/27	10	Electrical analogies of mechanical systems	notes	2.5 - 9
	Th	09/29	11	Electrical analogies of mechanical systems, Stability and Performance of Control Systems	4.1 - 3	2.5-9, 6.1
7	T	10/04	12	Steady-state error and Integral control, Routh-Hurwitz stability test, Eliminate ss error, Reject ss disturbance, RL1	4.1-3, 4.5.1	6.2, Ch.7, 9.2
	Th	10/06	13	Root-locus rules, examples	4.6.1	8.1 - 4
8	S	10/08		Fall Break		
	Su	10/16				
9	T	10/18	14	Root-locus rules review, finish basic examples, review for exam	4.6.2	8.1 - 4
	Th	10/20		Exam 2		
10	T	10/25	15	Root-locus additional rules, break points, Deptarture (& arrival) angles, examples	4.6.3	8.5 - 7
	Th	10/27	16	Root-locus design, PI, Lag, PD, PID, Lead, Differentiator problems	4.6.5, notes	9.1- 4

					Books	
					Bodson	Nise
11	T	11/01	17	Root-locus design, Feedback design for phase-locked loops, Variations of Root Locus, discussion of PLL lab	4.7, notes	notes
	Th	11/03	18	Physical realization, PID tuning and Relay logic	notes	9.6
12	T	11/08	19	Ladder Logic & Programmable Logic Controllers (PLCs) Frequency-Domain Analysis of Control Systems, Bode plots	notes	notes
	Th	11/10	20	Frequency-Domain Analysis of Control Systems, Bode Plot examples, inc complex poles & zeros, z, wn	5.1	10.1 - 2
13	T	11/15		Exam 3		
	Th	11/17	21	Bode Plots to Transfer functions, Gain and phase margins, Relation to transient response, Frequency-Domain Design	5.2 - 3	10.7-8,12-13
14	T	11/22	22	Frequency-Domain Design, Amplifier Feedback & freq response, Op Amp compensation, Zin, Zout	notes	notes
	Th	11/24		Thanksgiving		
15	T	11/29	23	Discrete-time Signals and Systems The z-transform	6.1	13.1 - 2
	Th	12/01	24	The z-transform, Properties of the z-transform	6.1	13.3
16	T	12/06	25	Inverse z-transform	6.2 - 3	13.3
	Th	12/08	26	Digital control, Last Day of Classes	Ch.7	Ch.13
	F	12/09		Read Day		
17	M	12/12		Final 10:30		