

# ECE 3510

Tentative

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01/04/12

## Spring 2012 COURSE SCHEDULE

Week	Date	lect	Topics	Books	
				Bodson	Nise
1	M 01/09	1	Introduction to Feedback Systems, Block diagrams	1.1	1.1 - 6
	W 01/11	2	Transfer functions and signals, The Laplace transform of signals	2.1	2.1
	F 01/13	3	The Laplace transform, Relationship between pole locations and signal shapes	2.1	2.2
2	M 01/16		Martin Luther King Day		
	W 01/18	4	Inverse of Laplace transforms using partial fraction expansions	2.2 - 3	2.2
	F 01/20	5	Inverse of Laplace transforms, Properties of signals	3.1	2.2
3	M 01/23	6	Transfer functions, Interconnected systems, Feedback system	3.1	2.3, 5.1,2
	W 01/25	7	Systems, Circuits, BIBO stability	3.2	2.4
	F 01/27	8	Responses to step inputs, % overshoot, effect of zeros	3.3	4.1 - 4.5
4	M 01/30	9	Responses to sinusoidal inputs, sinusoidal steady-state	3.4	4.6 - 8
	W 02/01	10	Effect of initial conditions	3.5	3.5
	F 02/03	11	State-space representations	3.6	3.1 - 3
5	M 02/06		Exam 1		
	W 02/08	12	Electrical analogies of mechanical systems	notes	2.5 - 9
	F 02/10	13	Stability and Performance of Control Systems	4.1	6.1
6	M 02/13	14	Control system characteristics	4.1	7.1
	W 02/15	15	Steady-state error and integral control	4.2	7.2 - 5
	F 02/17	16	Routh-Hurwitz stability test	4.3	6.2 - 5
7	M 02/20		Presidents Day		
	W 02/22	17	Root-locus introduction, main rules	4.4	8.1 - 5
	F 02/24	18	Root-locus additional rules, examples	4.4	8.5 - 7
8	M 02/27	19	Root-locus design, PI, Lag, PD, Lead	4.4	9.1 - 3
	W 02/29	20	PID, Lag - lead	4.4	9.4 - 5
	F 03/02	21	Catchup and Review		
9	M 03/05		Exam 2		
	W 03/07	22	Feedback design for phase-locked loops, discussion of PLL lab	4.5	
	F 03/09	23	Variations of Root Locus	notes	
	S 03/03		Spring Break		

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S	03/10	Spring Break			
Su	03/18				

10	M	03/19	24	Pole dominance, Physical realization,	notes	9.6
	W	03/21	25	PID tuning	notes	
	F	03/23	26	Ladder Logic & Programmable Logic Controllers (PLCs)	notes	
11	M	03/26	27	Ladder Logic & Programmable Logic Controllers (PLCs)	notes	
	W	03/28	28	Frequency-Domain Analysis of Control Systems, Bode plots	5.1	10.1 - 2
	F	03/30	29	Bode Plots complex poles & zeros, $\zeta$ , $\omega_n$	5.1	10.2
12	M	04/02	30	Bode Plots to Transfer functions	5.1	10.13
	W	04/04	31	Bode Plots to Transfer functions, Gain and phase margins	5.1, 3	10.7
	F	04/06	Exam 3			
13	M	04/09	32	Nyquist Criterion of stability, introduction	5.2	
	W	04/11	33	Nyquist Criterion of Stability, poles on the $j\omega$ axis	5.2	10.5
	F	04/13	34	Gain, phase and delay margins	5.3	10.6-7, 12
14	M	04/16	35	Relation to transient response, Frequency-Domain Design	5.3	10.8, 11
	T	04/17	Mechanical Engineering Design Day in the Union Ballroom, attendance required			
	W	04/18	36	Discrete-time Signals and Systems	6.1	13.1 - 2
	F	04/20	37	The z-transform	6.1	13.3
15	M	04/23	38	Properties of the z-transform	6.2	13.3
	W	04/25	39	Inversion of z-transforms	6.3	13.4
	F	04/27	Finals Begin			
16	W	05/02	Review 1:00 - 3:00 in			
	Th	05/03	Final Exam, 10:30 -12:30			