

UCI EECS
EECS 241B - Digital Communication II
Winter Quarter 2008

Meets: TTh 3:30-4:50 PM ELH 110
 Instructor: Prof. Ender Ayanoglu (*pronounced A-ya-no-lu*)
 Office Hour: W 3-4 PM
 Textbook: J. G. Proakis, *Digital Communications*, Wiley.
 Recommended: J. Barry, E. A Lee, D. G. Messerschmitt, *Digital Communication*, 3rd Ed., Kluwer, 2004.
 E. A. Lee, D. G. Messerschmitt, *Digital Communication*, 2nd Ed., Kluwer, 1994 (1988).
 S. Haykin, *Adaptive Filter Theory*, 4th Ed., Prentice-Hall, 2001 (1986, 1991, 1996).
 Relevant Texts: R. W. Lucky, J. Salz, E. J. Weldon, *Principles of Data Communication*, McGraw-Hill, 1968.
 Covers: Signaling for Bandlimited Channels, Wiener Filtering, Linear Equalization, Adaptive Linear Equalization, Maximum Likelihood Sequence Estimation for Equalization, Synchronization, Multi-Carrier Modulation, Spread Spectrum
 Grading: 15% Homework (Problem sets, extra credit), 35% Midterm, 50% Final. (Bonus project.)

Course Schedule				
			Pages	Pages
Lecture	Date	Subject	(Notes)	(Proakis)
1	1/8	Introduction		
2	1/10	Signaling for BL Channels, Nyquist Criterion	1.1-1.5	548-561
3	1/15	Whitened Matched Filter for Channel with ISI	1.6-1.13	601-604
4	1/17	Wiener Filtering, Orthogonality, Wiener-Hopf Eq.	2.1-2.8	
5	1/22	Linear Equalization, Zero-Forcing Equalizer	3.1-3.7	616-622
6	1/24	Linear Equalization, MMSE Equalizer	3.8-3.13	623-627
7	1/29	Adaptive Linear Equalization, LMS Algorithm	4.1-4.7	
8	1/31	Adaptive Linear Equalization, RLS Algorithm	4.8-4.14	
9	2/5	Fractionally Spaced Equalization	5.1-5.7	631-637
10	2/7	Decision Feedback Equalization	5.8-5.14	638-642
11	2/12	MIDTERM		
12	2/14	Maximum Likelihood Sequence Estimation (MLSE)	5.15-5.21	
13	2/19	MLSE for Equalization	5.22-5.27	
14	2/21	Synchronization, Carrier Phase Estimation	6.1-6.7	333-346
15	2/26	Costas Loop, Decision Directed Phase Estimation	6.8-6.14	347-359
16	2/28	Synchronization, Timing Estimation	6.15-6.19	359-365
17	3/4	Orthogonal Frequency Division Multiplexing (OFDM)	7.1-7.7	
18	3/6	OFDM: Cyclic Prefix, Capacity, Water Pouring	7.8-7.16	
19	3/11	Spread Spectrum	8.1-8.8	
20	3/13	Direct Sequence Spread Spectrum	8.9-8.17	
	3/18	FINAL 4-6 PM		