Ewha International Summer College

Course Syllabus

[Digital Communications]

Professor:	**TBA**
E-mail:	**TBA**
Home Univ.:	**TBA**
Dept.:	**TBA**

Description:	We study basic theories for the transmission of digital signals in various communication systems. The concept of noise and distortion in digital systems will be studied. We then extend our studies into error correcting coding. 1. Modulation and demodulation for digital information transfer. 2. Definition of noise and its influence on information reception. 3. Occurrence of errors in the digital receivers, and theories for the optimal recovery.

Objective:	1. To understand basic theories for the transmission of digital signals in various communication systems. 2. To understand the concept of noise and distortion in digital systems. 3. To extend our studies further into error correcting coding (channel coding).
Prerequisite::	Engineering Mathematics, Signals and Systems Textbook: John G. Proakis, Masoud Salehi, "Fundamentals of Communication Systems," Second edition, Pearson2014. (Note: We use *GLOBAL* edition.)

Credits	3	Contact Hours	45
Week 1	6/29(Tue)	Introduction: Basics of communication; From analog communication to digital communications.	
	6/30(Wed)	Chap.2 Signals and linear systems: 2.2 Fourier Series; 2.3 Fourier Transform	
	7/1(Thu)	Chap.2 Signals and linear systems: 2.7 Lowpass and bandpass signals; Concept of additive white Gaussian noise	
Week 2	7/5(Mon)	Chapter 7. Analog-to-digital Conversion: 7.1 Sampling of signals; 7.2 Quantization	
	7/6(Tue)	Chapter 8. Digital Modulation Methods in AWGN: 8.1 Geometric Representation of Signal Waveforms; 8.2 Binary Modulation Schemes; 8.3 Optimum receiver for Binary Modulated Signals	
	7/7(Wed)	Chapter 8. Digital Modulation Methods in AWGN: 8.4 M-ary Digital	

		Modulation; 8.5 M-ary Pulse Amplitude Modulation
	7/8(Thu)	Chapter 8. Digital Modulation Methods in AWGN: 8.6 Phase-Shift Keying; 8.7 QAM Digital Signals
Week 3	7/12(Mon)	Chapter 8. Digital Modulation Methods in AWGN; Mid Term EXAM
	7/13(Tue)	Chapter 13. Coding for Reliable Communications: 13.1 The Promise of Coding; 13.2 Linear Block Codes
	7/14(Wed)	Chapter 13. Coding for Reliable Communications: 13.2 Linear Block Codes
	7/15(Thu)	Chapter 13. Coding for Reliable Communications: 13.2 Linear Block Codes
Week 4	7/19(Mon)	Chapter 13. Coding for Reliable Communications: 13.3 Convolutional Codes
	7/20(Tue)	Chapter 13. Coding for Reliable Communications: 13.3 Viterbi Decoding
	7/21(Wed)	Chapter 15. Spread Spectrum Communication Systems: 15.1 Model of Spread spectrum systems; 15.2 DS-SS Spread spectrum systems
	7/22(Thu)	Chapter 15. Spread Spectrum Communication Systems: 15.4 Generation of PN Sequences; Final Exam

Evaluation(%)	Midterm	Final	Attendance	Assignments	Participation	Etc.
	40%	50%	10%	0%	0%	0%

※ Applicants with intent for more than one course are asked to make up a syllabus for each, repeatedly using the above template.