EE 370-032: COMMUNICATIONS ENGINEERING I COURSE OUTLINE

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O.H.: Sat. (9:00-10:00 AM), Mon. (9:00-10:50 AM), or by appointment

TEXT BOOK:
Lathi, B., *Modern Digital & Analog Communication Systems*, 3rd Ed., 1998

REFERENCES:
Martin R., *Analog and Digital Communication Systems*,
Couch, L., *Digital and Analog Communication Systems*.
Haykin, S., *Communication Systems*.

W	SUBJECT	SECTION	HW	LABORATORY
1	Introduction: Communication Systems, Signal Classifications and Operations, Unit Impulse Function, Review of Trigonometric and Exponential Fourier Series.	1, 2.1 – 2.4, 2.8 - 2.9	2.3-1, 2.4-1(e), 2.8-4(d), 2.9-1(b), 2.9-2	**No Lab**
2	Review of Fourier Transform, Properties of FT, Convolution, Linear Time-invariant Systems, Ideal and Practical Filters (LPF and BPF)	3.1 – 3.5	3.1-4(b), 3.1-7(a), 3.3-6(a),(b),3.4-1	Review Session: Fourier Series & Transform
3	Baseband and Carrier Communication, Amplitude Modulation (AM), Double Sideband Suppressed Carrier (DSBSC)	4.1 – 4.3	4.2-1, 4.2-4, 4.2-9, 4.3-1, 4.3-2	Exp. # 1 – Part a: Fourier Series (Matlab)
4	Quadrature Amplitude Modulation (QAM), Hilbert Transform, Single Sideband Modulation (SSB)	4.4 – 4.5	4.4-1, 4.5-1, 4.5-2, 4.5-5	Exp. # 1 – Part b: Fourier Transform (Matlab)
5	Vestigial Sideband (VSB) Modulation, Carrier Acquisition, Superheterodyne AM Receiver	4.6 – 4. 9	4.6-1, 4.8-1, 4.8-2	Exp. # 2: Analog Communication Board (ACB)
6	Angle Modulation: Instantaneous Frequency, Frequency Modulation (FM) and Phase Modulation (PM). Bandwidth of Angle Modulated waves	5.1 – 5.2	5.1-1, 5.1-2, 5.1-3, 5.2-1, 5.2-2	Exp. # 3: AM (Matlab)
Major Exam I, Monday, March 22nd, 6:30-8:00pm, Location: To be decided				
7	Wide-band FM, Generation of FM Waves	5.2 cont. – 5.3	5.2-4, 5.2-5, 5.2-6, 5.3-1, 5.4-2	Exp. # 4: DSB-SC & AM (ACB)
8	Demodulation of FM, Phase-Locked Loop (PLL), FM Receiver, Stereo FM	5.4, 5.6		Exp. # 5: FM (Matlab)
9	Sampling Theorem, Signal Reconstruction	6.1	6.1-1, 6.1-2(a), (b), (c), 6.1-3, 6.1-4, 6.1-5	Exp. # 6: FM (ACB)
10	Digital Modulation, Pulse Code Modulation (PCM), Uniform and Non-uniform Quantization	6.2.1, 6.2.2	6.2-1, 6.2-2, 6.2-3	**No Lab**
11	Telephony Multiplexing Systems, Differential Pulse Code Modulation, Delta Modulation	6.2.4 – 6.4	6.2-5, 6.2-6, 6.2-8	Exp. # 7: Sampling & Quantization (Matlab)
12	Digital Communication systems, Line Coding	7.1-7.2	7.2-1, 7-2.2, 7-2.3	Exp. # 8: PAM (DCB)
Major Exam II, Sunday, May 2nd, 7:00-8:30pm, Location: To be decided				
13	Band-limited channels, ISI and Pulse Shaping	7.3	To be decided	Exp. # 9: PCM and TDM (DCB)
14	M-ary Communication, Digital Carrier Systems	7.7-7.8, 7.3	7.7-3, 7.8-1, 7.9-2	Exp. # 10: Channel Effects (DCB)
15	Selected topics in communication technologies, Course Review	Selected topics		Lab Exam

- **Grade Distribution**
  - Class work (Quizzes, HW, Attendance) 15%
  - Laboratory 20%
  - Major Exam I 15%
  - Major Exam II 15%
  - Design Project 5%
  - Final Exam (Comprehensive) 30%

- **Attendance**: Missing 20% of the classes will result in a DN grade. Only official excuses for absences are accepted.
- **Homework**: HWs due on Sat. following the assignment. Solutions can be obtained in Bldg-21 (photocopy room).
- **Quizzes**: 6 Quizzes, scheduled bi-weekly.