

COURSE: EECS 353. TITLE: Introduction to Communications Systems. PREREQUISITES: EECS 306.		ELECTIVE.
TEXTBOOK: B.P. Lahti, <i>Modern Digital and Analog Communications</i> , Oxford.		
CATALOG DESCRIPTION: Mathematical analysis of signals and signal processing used in analog and digital communication systems; sampling; quantization; pulse transmission; intersymbol interference; Nyquist criterion; partial response signals; eye diagrams; equalization; mixing; analog modulation and demodulation; receiver architectures; phase-locked loops; signal-to-noise ratio analysis; digital modulation and demodulation; spread spectrum communications.		
COURSE OBJECTIVES: 1. To teach students basic frequency-domain technique for analog baseband communication links; 2. To teach students carrier modulation techniques used in AM and FM modulation systems; 3. To teach students the principal methods of coherent and incoherent carrier demodulation; 4. To teach students the basics of real-world analog communications systems such as radio and TV.		TOPICS COVERED: 1. Fourier transforms, spectra, autocorrelation, signal theory 2. Baseband communication: PAM, PPM, PCM. A/D,D/A,SNR,THD 3. Bandpass, analytic, quadrature 4. Linear modulation: AM, SSB 5. Nonlinear modulation: FM, PM 6. Phase-locked loop: tracking
COURSE OUTCOMES [Program Outcomes Addressed] 1. Ability to compute envelopes, in-phase quadrature, autocorrelation, and power spectra; [1,13] 2. Ability to compute total harmonic distortion and overmodulation distortion (Carsonis rule); [1,13] 3. Ability to design a superheterodyne receiver, given bandwidth and AM carrier frequency; [1,13] 4. Ability to design a phase-locked-loop for pilot carrier recovery in 3 dB SNR; [1,13]		ASSESSMENT (Course outcomes) 1. Weekly problem sets [1,2,3,4] 2. 1 midterm and 1 final exam [1,2,3,4]
PROGRAM OUTCOMES ADDRESSED: 1 PROFESSIONAL COMPONENT ADDRESSED: 13 PREPARED BY: Andrew E. Yagle on Nov. 8, 2004	CLASS/LABORATORY SCHEDULE: LECTURES: 2 per week @ 90 minutes.	

COURSE DESCRIPTION: University of Michigan, College of Engineering, ELECTRICAL ENGINEERING PROGRAM