Course Name:	**ECE 44000 Transmission of Information**
Credit and contact hours:	(4 cr.) Class 3, Lab 1
Course coordinator's name	Lauren Christopher
Textbook	R. E. Ziemer and W. H. Tranter, *Principles of Communications*, 7th Edition, John Wiley and Sons, 9781118078914, 2014.
Course Information	**2020-21 IUPUI Campus Bulletin description:** ECE 44000 Transmission of Information (4 cr.) P: ECE 30100 and ECE 30200. Class 3, Lab 3. Analysis and design of analog and digital communication systems. Emphasis on engineering applications of theory to communication system design. The laboratory introduces the use of advanced engineering workstations in the design and testing of communication systems. **Prerequisites/ CoRequisite** P: ECE 301 and ECE 302 **Indicate whether a required, elective, or selected elective course in the program**
Goals for the course	Upon successful completion of the course, students should be able to 1. Determine the frequency content of any signal, that is, the student should be capable of obtaining the signal's Fourier series and/or its Fourier Transform. [1,6] 2. Determine whether a mathematical representation of a signal is an AM signal, a DSB signal, a SSB signal, an FM signal, or a PM signal. [1] 3. Determine the appropriate demodulator after determining the nature of the signal to be demodulated. [1,2,6] 4. Given the mathematical representation of a modulated signal, determine its bandwidth, the spectrum it occupies, and its energy/power, after determining the nature of a modulated signal. [1] 5. Determine the Signal-to-Noise ratio of the output of the demodulator when the modulated signal has been corrupted by additive noise. [1,6] 6. Given a probability model describing a discrete memoryless channel, determine the probability of committing an error. [1,6]
List of topics to be covered	1. Review of Linear Systems, Fourier series, complex Fourier spectrum, Fourier transform and its properties (4 classes) 2. Amplitude modulation systems, AM spectra and bandwidths, double sideband, suppressed carrier and single sideband systems, modulators and mixers, AM receivers. (6 classes) 3. Frequency modulation systems, FM spectra and bandwidth, generation of FM signals, detection of FM signals (6 classes)

	4. Probability, Bayes Theorem, and Stochastic Processes (4 classes) 5. Effects of noise in AM and FM systems (4 classes) 6. Narrowband Signals and Systems (2 classes) 7. Digital communication techniques (4 classes) 8. Review and exams (3 classes)
Syllabi Approved by	Lauren Christopher
Date of Approval	3/15/2022