

ECEn 485. Introduction to Digital Communication Theory

Catalog Description:	ECEn 485. Introduction to Digital Communication Theory. (4:3:3) F Analysis and design of digital communications systems in AWGN: signal space concepts, modulation, matched filter and correlation detection, synchronization, performance. Computer based design exercises.	
Course Type:	Engineering Topics	
Prerequisites:	ECEn 370, 380	
Textbooks and/or other required materials	M. Rice, <i>Digital Communications: A Discrete-Time Approach</i> , bookstore packet.	
Topics Covered:	<ol style="list-style-type: none"> 1. signal spaces and their application to modulation and detection. 2. baseband PAM, and bandpass QAM 3. pulse shapes, including Nyquist pulse shapes 4. discrete-time PLLs and carrier phase synchronization 5. discrete-time PLLs and symbol timing synchronization 	
Course Competencies:	Application of linear algebra in describing digital modulation using the constellation representation.	Outcome 1
	Application of probability and statistics to bit error rate analysis of digital communication systems.	Outcome 1
	Ability to design communication system parameters and understand their trade-offs using a link budget.	Outcome 3
	Ability to apply matched filter techniques to detection.	Outcome 5
	Ability to design a PLL loop filter to meet given specifications.	Outcome 5
	Ability to simulate digital communication systems using Simulink and Matlab.	Outcome 11
Schedule:	Lectures: MWF 9:00 – 9:50am Laboratory: Open TA Recitations: (None)	
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