ECE 417 Spring 2018 Exam 1 Review

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Topics to be covered:

- Fourier transforms: CTFS, CTFT, DTFT, DFT; Delta $\leftrightarrow$ Exponential, Rectangle $\leftrightarrow$ Sinc

- Filtering: Multiplication $\leftrightarrow$ Convolution

- Random Signals: Stochastic, Signal, and Circular autocorrelation functions and their Fourier transforms

- Speech: $s[n] = h[n] * e[n]$, $e[n] = u[n] + v[n]$

- Windowed Speech: Windowed periodic signals

- Mixed Excitation: synthesis of $v[n]$ from time-domain cosines, and $u[n]$ from frequency-domain Gaussians

- Mixed Excitation: you should understand that real-valued linear regression is the solution to minimizing the squared error (sample problem 7.1). You don't need to understand the complex-valued extensions (ps 7.2).

- Classifiers: Linear, Bayesian

- Gaussians

- Principal Component Analysis

- MFCC

- HMM

- Baum-Welch

The exam will be composed of six long-answer problems, similar to the sample problems that have been distributed with each lecture.

- ALLOWED: one page of notes, handwritten, front and back.

- NOT ALLOWED: calculators.