

ECE 340, Final Exam Review, Fall 2011

Sections Covered Since Exam #2: 8.1 – 8.2-1, 8.3 – 8.4, 3.1 – 3.3, 3.5 – 3.8, 5.1 – 5.3-2, 5.5, 5.8

For this exam, in addition to material from previous exams, you should be able to:

- Sketch the Fourier Transform of a discrete-time signal with ideal or practical sampling
- Determine the Nyquist sampling rate of a signal
- Graphically demonstrate Nyquist theorem and continuous-time signal recovery
- Prove that discrete-time sinusoids with frequencies differing by a multiple of the sampling rate are identical
- Graphically demonstrate the ideal interpolation formula
- Compute bit rate required for Nyquist sampling and given number of bits/sample
- Sketch the time-domain signal that results from sampling in the frequency domain and determine whether time-domain aliasing will occur
- Identify and sketch fundamental discrete-time signals and signal operations
- Compute the energy or average power of a discrete-time signal and determine if signal is an energy or power signal
- Sketch changes to the Fourier Transform of a discrete-time signal due to decimation or interpolation
- Find the discrete-time sequence that results from sampling a continuous-time sinusoid with complex frequency, and explain why left-half s-plane maps to inside the unit circle of z-plane
- Determine the characteristic polynomial of a discrete-time system and solve for characteristic roots
- Find the impulse response of a discrete-time system
- Find the zero-state, zero-input, and total responses of a discrete-time system using time-domain analysis (solving difference equation)
- Find the zero-state response of a system using the z-transform
- Perform discrete-time convolution and apply properties
- Calculate output of a LTID system due to an everlasting or causal input of the form z^n
- Determine whether a LTID system is BIBO stable
- Find the z-transform of finite or infinitely-long sequences and apply z-transform properties
- Find inverse z-transforms using partial fraction expansion and transform tables/properties
- Determine the frequency response of a LTID system from its z-transform $H(z)$
-