

# Learning Objectives For Midterm

Dror Baron

February 2016

Students should be able to demonstrate the following skills:

1. Characterize signals and systems via their properties: continuous/discrete time, symmetric, linearity, causality, etc.
2. Evaluate whether a proposed signal suffers from aliasing when sampled at a prescribed rate.
3. Compute the Nyquist rate required to sample an analog signal.
4. Stability: determine whether a system is BIBO stable - using “inspection,” absolute summability of the impulse response, properties of its z-transform, etc.
5. Convert between direct form 1 and direct form 2 implementations of difference systems.
6. Compute the correlation between sequences - directly or using convolution.
7. Demonstrate how the region of convergence relates to properties of a signal and/or a system.
8. Utilize properties of z-transforms to simplify the computation of the z-transform of a signal.
9. Sketch a pole-zero plot, and infer properties of a signal from its pole zero plot.
10. Difference systems: solve them via z-transforms and solve for their initial conditions using the one-sided z-transform.
11. Fourier transforms: move between the time domain and frequency domain and back.
12. Compute the energy of a sequence in the time domain or frequency domain using Parseval's theorem.

And here are the formalities:

1. You need to work out your solutions by hand and justify (explain) your answers.

2. While the WebWork homeworks were along the lines of “training” questions that familiarize you with concepts, the Midterm will have questions of different difficulty levels. (See tests in previous years for examples.)
3. Open book; open handouts; open notes. Simple calculators will be allowed; communicating devices will not.