**ECE 3512: Signal – Continuous and Discrete**

# Recitation No. 1: MATLAB Basics

The goal of this laboratory is to familiarize you with basic capabilities in MATLAB to manipulate external data.

The tasks to be accomplished in this lab are:

1. Load the audio files provided on the course web site into MATLAB. Display the waveforms as a function of time for two time scales: (a) from [0, 10 secs]; (b) [3, 4 secs]. Also plot a spectrogram using the built-in MATLAB tools for this. Explain what you observe.
2. Use the symbolic integration tools to integrate:

(a) sin(2π\*100 Hz\*t) from [0, α] for α = [0.0, 0.02 secs] in steps of 0.001 secs. Plot the value of the integral as a function of α.

(b) e-αt for α = [1.0, 0.1 secs-1].

Verify your results through analytic integration.

1. Consider a signal that is a sum of two sinewaves represented by frequencies f1 and f2. Compute the power of the signal by integrating the square of the signal over the interval [0,1]. Consider three cases:

f1 = 1 Hz, f2 = 2 Hz

f1 = 1 Hz, f2 = 1.31 Hz

f1 = 2 Hz, f2 = 4 Hz

Do this analytically and then verify your results in MATLAB. Explain your results.