# EE4820: Biomedical Signal Processing
# Problem Set 1: Biomed Signals Overview and Matlab Refresher

### Department of Electrical and Computer Engineering
### California State University, Los Angeles

### Due on Mon. Jan. 31

Learning objectives

- Biomedical signal applications

- Review of basic programming in MATLAB environment

- Fundamental MATLAB functions

- Fundementals of noise

1. MATLAB exercise

   - Start MATLAB
   - For each of the following commands, write the output that would be displayed in the command window if the command was executed:

   a) `x = 5; y = -4;`
      `x*y`

   b) `x = [-1 3; 2 -2; 4 -3]`

   c) `x(3, 1)`

   d) `-3*x`

   e) `y = [3 5 2; -1 2 -4]`

   f) (using the same $x$ and $y$ from parts `b` and `e`.

      `z = y*x`

   g) `z([1 3])`

   h) `z = [9:-2:1; -7:3:5]`

    i) What happens if you type `z(3, 2)`?

    h) Using the same $z$ from part h, what is the output when you type:

        `z'`

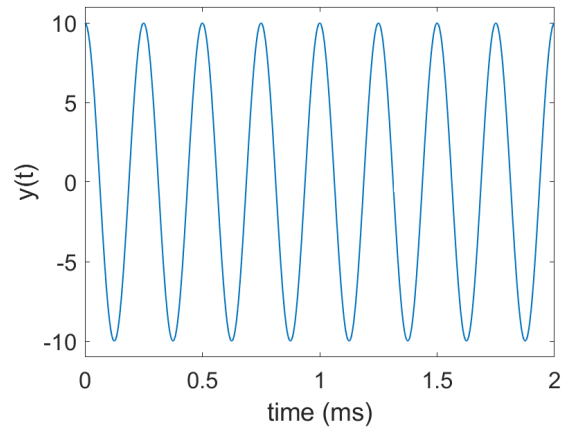    h) Write code to generate the figure shown in Fig. 1.



Figure 1:

2. Semmlow P2.4

3. Determine the digital values for one period of a 5 Hz sine wave with an amplitude of 1V, offset by 1V, sampled at a rate of 25 samples per second. (The analog waveform ranges from 0 to 2V). Therefore, you should only need to convert 5 samples. Suppose the full scale analog voltage range is 3V, and you use a 6-bit A/D converter. Show your work.