EGR 110 Due Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Engineering Graphics

File: EGR 110 MATLAB Assignment C

# MATLAB Assignment C - User-defined Functions

**Reading Assignment:**

EGR 110 MATLAB Lecture C - User-defined Functions

Chapter 7 in MATLAB – An Introduction with Applications, 5th Edition, by Gilat (freely available through Safari books on the TCC library website)

**General instructions for all MATLAB assignments.**

* **Warning**: Your assignments must be your own work. You can ask other students questions, but sharing files is cheating. If any evidence of copied files is discovered, all parties involved will receive grades of 0 and may be subject to further disciplinary action.
* For **all problems**, begin all MATLAB programs (scripts or .m files) with the following information:

% John Doe (**your name**)

% EGR 110

% Homework Assignment #?, Problem ?

% Filename: YourFileName.m

% Instructions: (briefly summarize the instructions for the problem)

* Use descriptive variable names
* Use ***format compact*** to reduce extra lines in the output.
* Use the disp( ) function to display your name and assignment number.
* Print the program (script or .m file) and the results for each problem. If you post the results online, post both the program and the results.

**MATLAB Assignment:**

1. Write and test a ***user-defined function*** to convert speed in mph to m/s.

The input to the function is speed in mph.

The output of the function is speed in m/s.

Test the function by writing a main program where the main program prompts the user for the input and the main program displays the output.

The main program should display an error message if the input is < 0.

* Test the program for 55 mph.`
* Test the program for 70 mph.
* Test the program for a negative input.

Turn in a printout of the function, the main program, and the test results.

1. Write and test a ***user-defined function*** to convert height in inches and mass in pounds-mass (lbm) to height in cm and mass in kg).

The function has two inputs: height in inches and mass in pounds-mass (lbm)

The function has two outputs: height in cm and mass in kg

Test the function by writing a main program where the main program prompts the user for the two inputs and the main program displays the two outputs.

The main program should display an error message if either input is < 0.

* Test the program for a person that has a height of 71 inches and a mass of 181 lbm.
* Test the program for a negative height
* Test the program for a negative input

Turn in a printout of the function, the main program, and the test results.

1. Write and test a ***user-defined function*** to calculate the three angles of a triangle given the three sides.

The function has 3 inputs: the three sides of the triangle (a, b, c)

The function has 3 outputs: the three angles of the triangle in degrees (A, B, C)

Test the function by writing a main program where the main program prompts the user for the three inputs and the main program displays the three outputs.

The main program should display an error message if any side < 0 or if any side > the sum of the other two sides.

* + - Test the program for a triangle with sides 3, 4, 5
    - Test the program for a triangle with the sides 10, 10, 10
    - Test the program for each of the 6 types of invalid triangles (any side < 0 and any side > sum of the other two sides)