# EGR 120 Due date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Introduction to Engineering

File: EGR120-MATLAB-B

**Homework Assignment #5 (MATLAB Assignment B)**

**Reading Assignment:**

Read Chapter 15 in Engineering Fundamentals – An Introduction To Engineering, 5E by Moaveni.

PowerPoint: EGR120-MATLAB-B

**Computer Assignment:**

* **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 120

% Homework Assignment #?, Problem ?

% Filename: YourFileName.m

% Instructions

* Use descriptive variable names
* Use ***format compact*** to reduce extra lines in the output.
* 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.

1. (30 pts) ***Table Only***. Work problem 15.4 in the textbook. Additional requirements:
   * Write a MATLAB program (script or .m file).
   * Begin with the block of comments as described above. Add other comments throughout the program.
   * Use a range variable to assign the values in degrees C to a vector.
   * Use a formula on the vector above to create another vector in degrees F.
   * Combine the transpose of the two vectors to create a new vector (table).
   * Display the problem number and your name before displaying the table.
   * Display the table and include a table heading (with units).
   * No special formatting is required for this problem.
   * Print the script and the output table.
   * Extra credit: Use fprintf to use 3 digits after the decimal point for the values in degrees C and to use 2 digits after the decimal point for the values in degrees F.
2. (35 pts) ***Table and Graph***. Write a MATLAB program (script or .m file) to create a table showing angle α in degrees and sin(α) as α varies from 0 to 360 degrees. Also graph sin(α) vs α. Specifically:
   * Write a MATLAB program (script or .m file).
   * Begin with the block of comments as described above. Add other comments throughout the program.
   * Use a range variable to assign the values of α from 0 to 360 degrees in increments of 15 degrees.
   * Use a formula on the vector above to create another vector for sin(α).
   * Combine the transpose of the two vectors to create a new vector (table).
   * Display the problem number and your name before displaying the table.
   * Display the table and include a table heading (with units).
   * No special formatting is required for this problem.
   * Extra credit: Use fprintf to use 1 digits after the decimal point for angle α and to use 4 digits after the decimal point for sin(α).
   * Form a graph of sin(α) vs α. Add major gridlines. Label the axes. Add a title.
   * Print the script, the output table, and the graph.
3. (35 pts) ***Table and Graph***. Write a MATLAB program (script or .m file) to create a table showing radius R and volume V for a sphere as R varies from 0 cm to 50 cm. Also graph volume vs radius. Specifically:
   * Write a MATLAB program (script or .m file).
   * Begin with the block of comments as described above. Add other comments throughout the program.
   * Use a range variable to assign the values of R from 0 to 50 cm in increments of 5 cm.
   * Use a formula on the vector above to create another vector for the volume of the sphere. Note that a dot operation will be required.
   * Combine the transpose of the two vectors to create a new vector (table).
   * Display the problem number and your name before displaying the table.
   * Display the table and include a table heading (with units).
   * No special formatting is required for this problem.
   * Extra credit: Use fprintf to use 0 digits after the decimal point for the radius and 2 digits after the decimal point for the volume.
   * Form a graph of volume vs radius. Add major gridlines. Label the axes. Add a title.
   * Print the script, the output table, and the graph.