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

Introduction to Engineering

File: EGR120-Excel-B

**Homework Assignment #8 (EGR120-Excel-A)**

**Reading Assignment:**

Read Chapter 14 in Engineering Fundamentals – An Introduction To Engineering, 5E by Moaveni.

Class Notes – Excel-A PowerPoint Presentation

**Computer Assignment:**

* Complete the assignment described below.
* Use only one Excel file to store all parts of the assignments by placing each part on a different sheet (Sheet1, Sheet2, Sheet3, etc – renamed as Problem 1, Problem 2, Problem 3, etc) within the file.
* Submit the single Excel file using Canvas. All Excel assignments will only be accepted via Canvas.
* **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 the worksheet with the following information:

John Doe (**your name**)

EGR 120

Homework Assignment #7, Problem \_\_\_

Instructions

Appropriate title for the table

See a ***Sample Excel Solution*** on the last page of this assignment.

1. **Problem 14.5 in the text**. Modify the text problem to include temperatures in kelvin and degrees Rankine. Additional specifications or details are provided below.

* Create a table of temperature values similar to the one shown below (same formatting).
  + Enter the values for temperatures in degrees Celsius from -50°C to +150°C in increments of 10 °C (use AutoFill).
  + Enter Excel formulas to calculate the values of temperature in Fahrenheit, Kelvin, and Rankin using the relationships shown below.

|  |  |  |  |
| --- | --- | --- | --- |
| Temperature  (°C) | Temperature  (°F) | Temperature  (K) | Temperature  (°R) |
| -50 |  |  |  |
| -40 |  |  |  |
| · |  |  |  |
| · |  |  |  |
| 150 |  |  |  |

* + Include two digits after the decimal point for temperature in degrees Fahrenheit, Kelvin and degrees Rankin.
  + Center each column, and use the line types indicated.
  + Use the Equation tool in Excel (Insert – Equation) to create the equations shown above and show them above the table in Excel
  + Include sample Excel formulas for the first line of calculations under the table.
  + From the tabulated information, when does temperature in oF equal temperature in oC? Add shading to the two cells to highlight them.

2. **Problem 14.7 in the text**. Additional specifications are listed below.

* + Number of digits after the decimal point: 1 for mass in kg, 2 for mass in lbm, 3 for mass in slugs
  + Line types: double lines on the outside and around the heading, single lines on the inside
  + Include sample Excel formulas for the first line of calculations under the table

1. **Table of Distance, Velocity, and Acceleration of a Particle as Time Varies**

* Generate a table to calculate the distance, velocity, and acceleration for a particle using several values of t as defined below:

t = 0.0 to 4.0 in increments of 0.2 (enter these values using AutoFill)



* Your output should appear as shown below
* Use the same line types in boxing the table
* Center the columns
* Use one digit after the decimal point in each column
* Include the mathematical equations above the table using Microsoft Equation 3.0
* Include sample Excel formulas for the first line of calculations below the table.

|  |  |  |  |
| --- | --- | --- | --- |
| t (s) | x (m) | v (m/s) | a (m/s2) |
| 0.0 |  |  |  |
| 0.2 |  |  |  |
| . |  |  |  |
| 4.0 | 1740.8 | 1105.6 | 452.8 |

1. **Analysis of a Triangle using the Law of Sines**

* Generate a table to calculate side B, angle , and angle  for the triangle shown while side C varies from 1 inch to 15 inches.



Analyzing the triangle above using the ***law of sines*** yields the following relationships:

(continued on next page)

Additional specifications for Problem 4:

* Let Excel do the calculations. For example, do not enter 0.5 in place of sin(30).
* Use proper formatting, centering, line types, Greek letters, number of digits, etc., as shown below.
* Include the mathematical equations above the table using Microsoft Equation 3.0
* Draw the triangle above (properly labeled) using the Microsoft drawing tools (Insert – Shapes)
* Include sample Excel formulas for the first line of calculations under the table.

|  |  |  |  |
| --- | --- | --- | --- |
| C (in) |  (degrees) |  (degrees) | B (in) |
| 1 | 2.86 | 147.1 | 10.85 |
| 2 |  |  |  |
| 3 |  |  |  |
| . |  |  |  |
| . |  |  |  |
| 15 |  |  |  |

1. **Density of a 275 g sphere as radius varies**. Calculate the density (using various units) of a sphere with a mass of 275 g as the radius of the sphere varies from 1.5 cm to 12.5 cm in increments of 0.25 cm. Additional specifications include:

* Note that Density = mass/Volume or m/V.
* Specify the mass of the sphere above the table and refer to it using an absolute address to calculate volume.
* Use Microsoft Equation 3.0 to show the unit conversions for the first line of the table using dimension analysis.
* Include sample Excel formulas for the first line of calculations under the table.
* Use 2 digits after the decimal point for all values in the table.
* Use scientific notation for all values in the table that are less than 1.00 or greater than 9999.99. All other values should be in fixed-point notation (non-scientific).
* Highlight all values in the table that are in scientific notation.
* Include units in the table heading.
* The table might look as follows:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Mass: | 275 | g |  |  |  |
|  |  |  |  |  |  |
| Radius, R (cm) | Volume, V (cm3) | Density,  (g/cm3) | Density,  (kg/m3) | Density,  (slug/ft3) | Density,  (lbm/in3) |
| 1.50 | 14.14 | 19.45 |  |  |  |
| 1.75 |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| 12.50 |  |  |  |  |  |

***Sample Homework Problem using Excel***

