Excel Assignment

1. In Excel enter the following data as shown:

Capacitance(pF)	Plate Separation(mm)
110	3
85.2	4
72.2	5
61.6	6
54.9	7
49.6	8
45.6	9
42.3	10
39.8	11
37.5	12
35.6	13

2. Read the Lab Manual, Pages 100-107 on the "Measurement of Electric Permittivity". Make a scatter plot of the data so that the slope is the Electric permittivity (ε_0) of free space. **HINT:** Be very careful about the units of the measurements given in the table (convert properly).
    a. **The area (A) of the Parallel plates is given by**: $0.031\ m^2$

How to make a scatter plot:

b. First highlight your two columns of data. The left column must be the x-axis values and the right column contains the y-axis values. **(You must make sure that you have the x-values in the left column and the y-values in the right column otherwise you will not be plotting the correct graph. Think about a linear graph what would happen to the slope?)**
c. At the top of the Excel Window, Click "Insert". The tab below the "Insert" will change.
d. Under the "Charts" section select "Scatter". A small window will drop down.
e. Click the image in the top left of the drop down box. The selection indicates you want a graph with only the individual data point plotted. The graph will now appear.
f. To add a graph and axis titles, Click on the graph and then Click on the "Layout" tab at the top of the Excel Window. The tab below will change again.
g. Under the labels section use the "Chart Title" and "Axis Title" buttons to add in the proper labels. **(Make sure to include units in the Axis Titles. Without units your graph is wrong!)**

How to add a trendline to your graph:

a. On your graph, right-click on a data point. All data points will be highlighted and a Window will pop-up.
b. Select the "Add Trendline" option. A new option Window will appear.
c. Under the "Trendline Options" tab, select the following: "Display Equation on Chart" and "Display R-squared value on chart".
d. Click "Close". The linear equation of your line will now appear on your graph.
e. You can move the equation anywhere on the graph by dragging it.

3. Use the "LINEST" instructions provided. There is a PDF with step by step instructions and a youtube video link on CANVAS.
4. Copy and paste your graph into a **MicrosoftWord File**. Do not submit an excel file, I want the word file. **You will lose points if you submit an Excel file.**
5. Make sure to include your **NAME**, and **U-NUMBER** in your Word file!
6. Copy your "LINEST" results into the Word File. Make sure to keep them in order. It should be a 2 column by 5 row result.
7. Answer the following questions **BELOW** the graph and LINEST results.
    a. What is the calculated slope of your graph.
    b. Calculate the Percent Difference between your calculated value for the permittivity and the given value for the permittivity.
    c. Calculate the t-value for your value of the permittivity. To calculate the t-value you will need the uncertainty in the slope of your graph. This value is given by your Linest results: it is the value in the second row of the first column.