PHYS 102 L7      Hooke’s Law    Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Purpose: To investigate Hooke’s law and determine the spring constants of elastic springs.

Apparatus: Springs, mass set, mass hanger (small), pendulum clamp, lab stand, and meter stick.

Theory: Think about stretching a spring. The more stretching force you apply, the more stretch you get. Robert Hooke (1635-1703), a British physicist, discovered this empirical relationship between the stretching force (F) and the stretch (x), known as Hooke's law.

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| hooke | The stretching force is provided by the added mass.  Stretching Force = (Added Mass) X Gravity.  When you collect data make sure that you reach the maximum stretch appropriate for the spring.  Hooke’s law is verified when there is a linear relationship between the Stretching Force & Stretch. Spring constant is the slope of the Stretching Force VS. Stretch graph. |

Procedure: Attach the mass hanger to a spring and hang the spring from the pendulum clamp. Attach the meter stick so that the 0-cm is at the indicator of the spring. Add an appropriate mass and measure the stretch. Repeat this for other masses and then for other springs.

Data Analysis:  
Enter your data [stretch (cm) and stretching mass (g)] in a spread sheet program. Create two more columns, and calculate Stretch (m) and Stretching Force (N). Plot Stretching Force *versus* Stretch and determine the slope, which is the average spring constant. Display the plots for all the springs in the same graph.

Attach your hard copies of the data table and graph and then attach your conclusion page.   
  
Include the following in your conclusion:

1. Begin your conclusion by re-stating the purpose in an appropriate form.
2. For each spring, state whether Hooke's law is verified or not.
3. List the average values of the spring constants you determined from the plots.
4. List the sources for errors and suggestions for improvements.