Please read these comments. My goal is to help you get the most out of this class, and improve the quality of the laboratory reports.

While the labs are geared to help you gain familiarity using some software such as Excel and Maple to solve numerical problems, this is not the goal of the class. The goal is to expose you to real issues faced in engineering design when trying to represent a real PHYSICAL phenomenon with a NUMERICAL representation. Your lab reports should address these issues and insight you gained in the lab/process of solving a particular problem, not simply repeat the question and the solution procedure without comments. I am interested in your final result and the importance/implications of your result. You may (and should) want to include some of the process you used to arrive at your solution **IF** it adds some insight into the problem and your discussion. You should **NOT** submit a step by step explanation of what you did in Excel or Maple.

These labs are designed to make you think and you will gain much more from the class by pushing yourself to think rather than blindly following the "brilliance of a thousand mathematicians" (a.k.a. Maple).

Below are EXAMPLES of what could be included for each problem in Lab 2. There is much more you could discuss for each, and you would not be expected to discuss all of these for each problem but the more the merrier.

If there are any questions please do not hesitate to contact me: bam23@drexel.edu

1. Boiling and triple points

Address difficulties and uncertainties when solving non-linear equations.
Why do solve and fsolve give you different answers?
Present relevant graphs (eg P v T) if it aids in your understanding/explanation.
Compare your answers to actual values including references if possible.
Comment on the accuracy/error.
Why should you trust a model that gives you physically impossible solutions? (i.e., it is a numerical description of reality but how good a description is it???)

2. Bond length

Compare your answers to actual values including references if possible.
Comment on the accuracy/error.
Present relevant graphs (e.g., V versus r) if it aids in your understanding/explanation.
Why should you trust a model that gives you physically impossible solutions? (i.e., it is a numerical description of reality but how good a description is it???)
Is a better model available?
Is a better model necessary?

3. Extruder

Comment on the method you used to solve the problem vs other methods available and why you chose to solve it the way you did.

DISCUSS the importance and implications of Q(k) and Q(k')
Plot Q versus RPM
DISCUSS the important details and implications of this plot
Give a way to solve the problem without a calculator

4. Stress-strain

Discuss the importance of fitting data
Present the values you obtained for h_0, q, and σ.
Discuss any significance of these values.
Are these values dependent on the points you used to calculate them?
PLOT stress-strain data, and your fit of the data using your calculated parameters.
Discuss error.
How would you get a "best" fit?