Format for Lab Reports (225L, 227L and others)

Lab reports are to be done on the computer and turned in online by the end of the lab period. This may be to the instructor’s PC with a thumb drive, the instructor’s email account with specified title information (e.g. Expt. 1 with Lab Partners names), or via Turnitin on Titanium, depending on your instructor’s preference. Since lab reports are due at the end of the lab period, to save time, one can omit typing equations and sample calculations. One can copy and paste equations from the lab write-up or internet if needed. Graphs and tables should be sized and formatted so that the entire report does not occupy more than 1-5 pages (more only in rare cases). A data table of hundreds of values from the computer that exceeds one page is not useful for the lab report. Neither are graphs that are too large or too small. A single long column of data can be combined into several shorter columns to fit on a page.

Sections and organization of the lab report:

1.) Experiment Title, Date, Lab Partners Names.

2.) Purpose/Introduction: State in 2-4 sentences what you are going to determine or measure, how, and with what. (this could be done before lab after reading the experiment write-up)

Example:
Purpose/Introduction: In this experiment, the acceleration of gravity will be determined. A photo gate timer and computer software will be used to measure the time between successive, equally spaced clear openings on a “picket fence” rectangular plastic plate which is dropped. The process will be repeated 50 times, a histogram of the resulting values will be plotted, and the mean and standard deviation of the values of g and v0 will be calculated.

3.) Data/Observations: Data tables, observations, and annotations on any data or equipment that might have anomalies or that you discovered something about. DO NOT ERASE OR OMIT ANY DATA! ALL DATA IS USEFUL, EVEN IF INCORRECT. Simply draw a single line through data that you do not think is valid (this is strikethrough on the font menu under effects). State the reason(s) why data is invalid somewhere near the entry, or in a footnote.

4.) Results/Discussion: This section should include
graphs (properly formatted, axis labeled, title either on graph or in figure caption below it)
calculations and analysis. Make sure you have detailed sample calculations when appropriate, (time permitting).
Brief discussion or comments. Notes of what might have affected data, cautions or unusual things you noticed.
Answers to questions posed in the lab write-up should go here.

5.) Summary/Conclusions: Be quantitative when you have quantitative results, concisely state results obtained. Comment on accuracy of results and possible sources of error. Constructive suggestions for improvement of lab experiment or write-up. What was good about the experiment (i.e. what aspects you liked, if any).

Example: Summary/Conclusions (a little long):
Fifty values for the acceleration of gravity were determined using the photogate timing apparatus and picket fence in combination with computer software to fit the data. The average value of the acceleration of gravity was found to be $g = 9.736 \text{ m/sec}^2$ with a standard deviation of $\sigma = 0.134 \text{ m/sec}^2$, resulting in a fractional standard deviation of $\sigma/g = 0.0138$. A histogram of the data was plotted, which showed the clustering of the experimental values about the mean, which was near the most probable value.

Similarly, the initial velocity of each trial was determined from the fit parameters and had a mean $v_0 = 0.857 \text{ m/sec}$ and a standard deviation of $\sigma = 0.213 \text{ m/sec}$. Variations in drop height above the photogate affect $v_0$ but not $g$. It was determined that a primary source of error in this experiment is a result of variations in the way the picket fence was held and released. In this regard, it is important for the experimenter to hold the picket fence near the centerline of the rectangle and release it without any rotation or hitting the side of the photogate.

(Example of constructive criticism in lab summary)
The lab write-up had too many questions and different parts for the limited time period in the lab. It is suggested that modifications of the write-up be made to eliminate some of the questions and the parts of the experiment that are not done in class, and to add the parts that the instructor had to tell us in lab, which were not written in the online write-up. (state what they were)