# Lab Report Formats

## Data Report

We understand how time-consuming writing lab reports can be. So we created this format to speed the process while still giving you valuable experience and giving us something to grade. A Data Report contains:

- Heading – We'd like this to be at the top of every page, which all word processors can do.
    - Title of Lab Report
    - List of Authors
    - Date of Lab
- Abstract – This is a one or more paragraphs of **text that summarizes the lab activity**.
    - It is not divided into sections.
    - The Introduction should be 1-3 sentences.
    - The Methodology should be fairly general. Only a few sentences are needed. This is only an Abstract, so less detail than in the Main Body. Describe what the equipment did, what was measured, and how that is related to the final analysis.
    - The Discussion must contain summary of the results. This means some numerical value, such as the final result of the analysis, must be given. If there is a list of final values, give the most important one or a typical value.
    - The Conclusion should be 1-3 sentences, and it must depend on the results. An explanation of any source of error should be included.
- Tables and Figures
    - All of your results of measurements and analysis should be presented in Tables and/or Figures.
    - Each Table and Figure must be labeled (Table 1, etc.) and **captioned**.
    - Do beautify your Tables.
        - Make sure the results are readable.
        - Trim out unnecessary decimal places.
        - Label each row and/or column. This should include the name and/or symbol, along with the units in parentheses.
        - Include the expected accuracy of the value (when requested).
    - In a graph, the axes must be labeled with a name or symbol, with units in parentheses.
        - If a trendline is requested, leave the equation on the graph.
        - Transcribe the trendline equation into the caption **using physics variables**.

Note that there is no Main Body (the longest part of most Lab Reports).

A sample report is located at: https://goo.gl/Kfl57H (lower-case ell in the middle)
The corresponding spreadsheet is also online, at https://goo.gl/apFZ5U.
Notice that the table was formatted for presentation in the report.

## Formal Report

This format closely matches what academic publishers want for scientific journal articles.
A Formal Lab Report contains:

- Heading – Just like a Data Report.
- Abstract – Just like a Data Report.
    - Remember it is a summary, not an introduction.
    - The Abstract should not say anything that is not stated elsewhere in the report.
- Main Body – 1-2 pages of prose. This is the main text of your lab report. Divide this text into sections:
    - Introduction – for the reader, not from the Instructions!
    - Methodology – Not a "standard operating procedure". Just describe what you did, with enough detail that a knowledgeable person could figure it out. Include any equations that will be used in the analysis.
    - Discussion – Describe the measurement results, analysis, and results of the analysis. Be clear about how each value was obtained. Don't list lots of similar values. Give a sample value or range of values, and refer to the Tables for the rest. Intermediate calculation results aren't needed here.
    - Conclusion – A sentence or two that summarizes the scientific results (not the skills gained). For example, you might compare the results of your data analysis with the expected values to say whether your results support or appear to contradict the theory. The theories we test are well-established, so if the theory is contradicted, you should explain where the errors may have come from. The conclusion must depend on your numerical results! It cannot contradict your results.
- Tables and Figures – Just like a Data Report.

# Grading Rubrics

Grading rubrics are posted in Blackboard and students are advised to refer to them before submission and after receiving grades.

## Data Reports

Here are **examples** of common ways of losing points.

- 20 points: Formatting.
  - Full credit if the report is easy to read and navigate.
  - -5 points: Missing captions.
  - -2 to 5 points: Pieces or blocks of unreadable material.
- 40 points: Experimental Data and Results
  - Basically grades the Tables and Figures. Full credit if all measured values are presented in Table/Figure form, all requested results are present, and all results are within the acceptable margins of error without mistakes.
  - -10 points: Missing Table or Figure.
  - -5 points: Table heading or Graph axes not properly labeled with units.
  - -5 points: Graph missing trendline and equation when requested.
  - -5 to 20 points: Mistake in data taking or in analysis.
  - -5 to 10 points: Confusing experimental with accepted or theoretical values
- 40 points: Abstract
  - -10 points: Giving an imperative step-by-step procedure instead of general methodology.
  - -5 points: Summarizing results without any numerical values.
  - -5 points: Presenting a vague conclusion that does not depend on the results.

## Formal Reports

- 5 points: Formatting
- 20 points: Abstract
- 10 points: Procedure
  - Includes the Introduction and Methodology in the text.
- 25 Points: Collected Data
  - Includes most of the Tables and Figures.
- 20 Points: Data Analysis
  - Includes processed values in the Tables and Figures.
  - Includes text description of how analysis was performed.
- 20 Points: Discussion and Conclusions
  - Final sections of the text.
  - Major results must be described and conclusions must be drawn from the results.

# Sample Data Report

A sample Data Report is available as a separate document:

https://goo.gl/Kfl57H (lower-case letter “ell" in the middle)