

**Grading Rubric for Physics 256:** Lab reports will be graded out of 20 points using the following rubric. If a section is not applicable to a particular laboratory exercise, no points will be deducted.

| Component                | Points | Description  |
|--------------------------|--------|--|
| Identifying information  |        | Report contains a title, name of author and partners, and date of experiment.  |
|                          | -2     | Missing two or more: title, author, partners and date.   |
|                          | -1     | Missing title, author, partners or date.   |
|                          | 0      | Contains title, author, name(s) of partner(s) and date of experiment.  |
| Abstract                 |        | A brief summary of what was done, principle results, and conclusion.   |
|                          | -4     | No abstract.   |
|                          | -2     | Abstract does not really summarize paper.  |
|                          | -1     | Abstract is incomplete in what was done, principle results or conclusion, OR contains extraneous or overly detailed information.   |
|                          | 0      | Abstract succinctly summarizes report.   |
| Introduction             |        | Identifies the goals of the work and provides a succinct summary of physics ideas (including equations to be used) and any relevant previous work.                             |
|                          | -3     | Does not provide goals, physics principles nor relevant previous work.   |
|                          | -2     | Provides only goals, physics principles, or previous work.   |
|                          | -1     | Incomplete goals, physics principles or previous work.   |
|                          | 0      | Identifies goals of the lab, summarizes the physics principles involved, and briefly discusses relevant information from previous work.  |
| Experimental Description |        | A succinct description of the procedures employed to collect and analyze data.   |
|                          | -4     | Missing description of what was done.  |
|                          | -2     | Significant information missing from description of what was done.   |
|                          | -1     | Incomplete description of what was done OR long/unfocused description.   |
|                          | -1     | Reads as instructions instead of what was done.  |
|                          | 0      | Description of procedures that is sufficient that the reader can understand and repeat key elements of experiment w/o being excessively long or including unimportant details. |
| Data presentation        |        | Numerical values of measurements and calculations are presented throughout all sections of the report in appropriate format and with appropriate information.                  |
|                          | -4/-2  | Report lacks most (some) important measured and/or calculated values presented numerical or graphically.   |
|                          | -1     | Data that would be better presented in a table is presented in text or lists.  |
|                          | -2/-1  | Units missing on all/some numerical values that should have units.*  |
|                          | -2/-1  | Uncertainties missing on all/some numerical values that should have units.   |
|                          | -2/-1  | Numerical values presented without any indication of what they are.*   |
|                          | -1     | Excessive (meaningless) numbers of digits provided for numerical values.   |
|                          | 0      | Sufficient data and calculations presented, identified, and include appropriate units and uncertainties .  |

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\* Units and identifying information are preferably provided in column headings (and in some cases row headings as well) when numerical values are presented in tables.

|                              |   |   |
|------------------------------|---|---|
| Graphs                       | Well constructed graphs are included as appropriate.  |   |
|                              | -4/-2   | Missing all/some graphs needed to support the report's conclusions. <sup>†</sup>  |
|                              | -2 /-1  | Axis of graphs do not legibly identify quantities, including units,   |
|                              | -2 /-1  | Errors in formatting graph in Igor Pro (or similar programs): using lines for discrete data points or markers for fits, omitting error bars for quantities that have uncertainties (e.g. average values), poor choices for scaling. |
| 0                            | All needed graphs are present, are completely labeled, are scaled appropriately, and use good choices for markers, lines, and error bars.   |   |
| Calculations and description | Calculations are carried out appropriately and adequately described.  |   |
|                              | -3  | No description of the analysis.   |
|                              | -2  | Description of analysis confusing and difficult to understand.  |
|                              | -1  | Description of analysis incomplete or contains irrelevant information.  |
|                              | -2/-1   | Errors in calculations.   |
| 0                            | Description of calculations, including appropriate equations, adequately describes what was done.   |   |
| Results and conclusions      | Identifies main results, compares with expectations and identifies possible sources of error.   |   |
|                              | -5  | No results and conclusions.   |
|                              | -4  | Results and conclusion vague/incomplete and does not really discuss the specific results of the lab.  |
|                              | -2  | Does not compare numerical, calculated and/or theoretical results.  |
|                              | -1  | Errors in comparing or interpreting comparison of results.  |
|                              | -1  | Introduces data/results for first time in conclusion section.   |
|                              | -2  | Does not identify possible sources of error OR attributes them to non-specific causes such as "Human Error."  |
| 0                            | States the main result of the experiment, compares numerical result to expected/theoretical value with a percent difference and measurement uncertainties, and identifies likely causes of error. |   |
| General                      | Report is original, readable, written in appropriate style, and proper credit given for any elements derived from other works.  |   |
|                              | -10   | Significant parts of the report are plagiarized (derived from another work without crediting original author).  |
|                              | -10   | Report is based on data not taken by the author (without prior permission).   |
|                              | -5  | A significant amount of the report is derived from another person's work even if credit is given.   |
|                              | -2/-1   | Report not written in a professional manner: poorly organized/structured, uses slang or informal English (including contractions), and/or changes voice/tense.  |
|                              | -2/-1   | Report contains grammatical and/or spelling errors.   |
|                              | 0   | Report is well written and organized, is based on original work, and proper credit given to any parts taken from or derived from another's work.  |
| +1/+2                        | At instructor's discretion, bonus points may be given to reports that clearly exceed expectations.  |   |

<sup>†</sup> If there are multiple data runs that are quite similar, it is only necessary to include a representative sample.