

Laboratory Final Exam Guidelines

Physics 2019 / 2219

The final exam for Physics 2019/2219 is a **one-hour, closed note, closed manual, practical exam** that you will take **individually** (no lab partners!). It is designed to assess your overall knowledge of some basic laboratory skills. The exam is only **one hour**, and will highlight a few of the many concepts that you have learned during the semester.

To prepare for the exam, review the lab procedures and your lab reports. You should also make sure you are prepared to perform the following:

- Collect data using the computer interface (Capstone) and convert it into meaningful information. For example, you should be able to use a photogate to collect data, and utilize the information to report velocity.
 - **To prepare for this:** Review the various data collection techniques as outlined in the lab manual. Think of how the experimental setup made it possible for you to find the information you were looking for. If you have any questions about a specific laboratory setup, ask your lab instructor.
- Enter data into a spreadsheet and use the spreadsheet to perform simple calculations and analysis of your data.
 - **To prepare for this:** Review Appendix A for a review of various functions to use in Excel.
- Create a graph of data, and analyze slope (and uncertainty) of your graph. You should be able to relate the graph you have made to the appropriate mathematical function it represents. You should be able to support whether the graphed function is linear or not based on the mathematical equation. You should be able to relate the slope to a meaningful quantity in an equation (in $y=mx+b$ form).
 - **To prepare for this:** Review Appendix B for proper setup of graphs and tables. Review previous labs where linearization of a function was required, and make sure you understand how to compare graphs to mathematical functions.
- Analyze uncertainty in your measurements and report them appropriately. This means you should be able to calculate standard deviation, percent error, and percent difference. You may be asked specifically to perform these calculations **by hand** or you may be allowed to use the computer.
 - **To prepare for this:** Review the equations for standard deviation, percent error, and percent difference. Make sure you understand how to estimate uncertainty from experimental measurements, and what these uncertainties mean when applied to a value or to error bars on a graph.
- You should know the basic relationships between fundamental variables, such as the relationship between velocity and acceleration, the relationship between pressure and temperature, etc.

Your lecture instructor determines the contribution of the Laboratory Final Exam toward your grade, as described in the course syllabus. Your laboratory instructor will determine the scheduling of exams during your lab period. Exams for each student and/or lab section may be modified, so each exam may have different questions and answers.