

Tentative Laboratory Calendar

Week	Day	Laboratory
1	January 16	Introduction
2	January 24	1. Measurement Lab: Mass and Density
3	January 30	2. Free Fall with Picket Fence
4	February 6	3. Inclined Plane
5	February 13	4. Projectile/Vectors
6	February 20	5. Circular Motion/Newton's Second Law
7	February 27	Midterm Exam
8	March 13	6. Work-Energy
9	March 20	7. Inelastic Collisions
10	March 27	8. Moment of Inertia/Rotational Equilibrium
12	April 3	9. Simple Harmonic Motion
11	April 10	Make-up lab
13	April 17	Semester Presentations
14	April 24	Final Exam

Formal Laboratory Guidelines

- 1. General Guidelines:** All materials should be typed. When possible, use computer plotting software to create graphs. Figures, sketches, and graphs may be hand-drawn, but should be done in ink. You must create a lab report that is unique and original, *not* a copy of your laboratory partners'. While the measurements will be the same as your partners', your analysis and presentation should be your own. Failure to do this will result in a grade of zero, at a minimum.
- 2. Title and Abstract Page:** This should be a separate page. It should include the title of the lab (you can be creative), your name, the name of your laboratory partners, the course number, the date the experiment was performed, and the name of your instructor. Also include an abstract. This is a synopsis of the laboratory report and should be 1-2 paragraphs long. Highlight the motivation and goals, methodology used, key results, and brief conclusions.
- 3. Scientific Method:** The remainder of your report should follow the key steps of the scientific method:
 - (a) Question:** What are you trying to figure out? Then give an overview/introduction to the topic, discussing its role and importance.
 - (b) Hypothesis:** Your guess as to what will happen. Try to base your guess on what has been taught in lecture or from the textbook, and explain this background. Do not change your guess after the lab exercise is completed—it is ok to guess wrong.
 - (c) Experiment:** Describe how the experiment was carried out. Include both your original plan, and any changes you made to that procedure. Include a list of the materials needed and identify the performance of the equipment (e.g. how precisely the manufacturer claims the instrument can make a measurement, which will be important later to evaluate uncertainties). Also include anything you noticed while performing the experiment.
 - (d) Analysis:** List your measurements in one or more tables, including uncertainties. Identify any measurements you think are less reliable. Perform any mathematical analysis to evaluate and understand your results. Evaluate measurement uncertainties and how those affect your derived results. Be sure to include units. Compare your results to the expected results.
 - (e) Conclusions:** Make a clear statement about whether your hypothesis was correct or incorrect. Discuss the results in the context of the original question, as well as whether (and how) the results contributed to answering that question. If appropriate, identify a general rule (or theory) consistent with your results that can make predictions about future experiments. If appropriate, discuss further experiments that could be made to further explore that model, probing the extent to which that model continues to be valid.

An example of a lab notebook entry and corresponding formal laboratory report are given in the following pages, after which are the descriptions for each of the labs we will be doing this semester.