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142 Technical Physics Lab

Gregory Braun
braung@xavier.edu

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Course Syllabus

PHYS 142 - Technical Physics Lab

Gregory Braun
206 Lindner
745-4237
braung@xavier.edu

Office/Lab Hours: Tuesday 2:00-3:00 is my one drop-in office hour. I am also usually on campus and can be available at the following times, but not necessarily in my office. I ask you to schedule ahead of time, so I can make a point of being available. Other times are also possible.

Tuesday 11:30 to 3:00
Thursday from 11:30 to 1:00
before or after my 1-3pm WF labs.

This goals of this laboratory course are to

- A. supplement the lecture material, as well as learn topics not covered in the lecture.
- B. utilize analytical and quantitative skills to design experiments and test theories.
- C. practice presenting data in written form.

Grading:

midterm & final - 30% (goals A & B)
lab reports or post-lab assignments - 60% (goals A, B & C)
Pre-lab quizzes - 10%

Grading Scale: 93 A, 90 A-, 87 B+, 83 B, 80 B-, 77 C+, 73 C, 70 C-, 60 D

Both the point values and grading scale are subject to change.

Labs	Centripetal
Motion	Force
Acceleration of	Pendulums
Gravity	Rotation
Projectile	Heat &
Motion	Temperature
Newton's First	Density
Law & Air	Half-life
Resistance	
Newton's	
2 nd Law	

Pre-Lab Quizzes

Each lab after the first will start with a quiz. Reading the handout and completing any pre-lab assignments will help. Each quiz will be given only a few minutes, and arriving late to class will give you less time. Coming to class late or unprepared is unfair both to your partner and

the other students in the class.

Lab Exams

The lab exams will test your understanding of both the experiments and the theory underneath. Treat these like you would any other test. Make a study guide, and review the material carefully. The handouts and your lab reports should be your primary sources; a well written abstract is a very good study guide.

Some exams will allow you to use lab data in your notebook for part of the test, so be sure to bring this data with you. This will be limited to one fairly permanent notebook of reasonable size. You may not use the lab handouts themselves, nor your reports. You may paste graphs in your lab book.

Lab Reports

Your lab report should tell a good story. This is not just about getting the right answers, it is about clearly expressing them in an organized, cohesive way. Your lab report should not be too long; a paragraph for the abstract, another for error sources, and data tables and calculations along the way usually suffice.

A report should **not** be a procedural list of what you did in order. While a procedure is a useful part of many reports, we will not use them in this class. Avoid use of phrases like “and then we.” It should also not include long discussion of the physics topics, devoid of reference to this particular experiment. You should not have multiple sentences with no mention of your experiment.

While first person is acceptable, avoid telling *your* story. You want to tell the story of the *experiment*. Explicit notes on the details of your experiment are great in the error sources, but the abstract should focus on the bigger picture of your experiment as a whole.

Lab reports should include good tables, which are easily readable. Many small tables can scatter your data and make comparisons difficult, so try to combine tables when possible. While you do not want your table to be too busy, you are usually better off putting more in than less. If there are numbers which are the same for every element in the table, put them above or below the table, rather than listing them many times. (Particularly if you only measured this value once.) Like almost every number, your table needs units. Put them in the heading for each row or column instead of listing for each variable, unless of course they are different for different values.

Near your table you need to explain where every number comes from. Many of these are simply measurements (i.e., we measured r with a ruler), while others will be calculations. A simple formula can suffice very well, but always be sure to indicate which values you are using. $F=mg$ doesn't tell much if there are several masses in the experiment.

Combine multiple parts in the lab when appropriate, and avoid repeating. The reader does not want to wade through paragraphs of repetition. Do not cut and paste large sections of text; instead combine these parts or refer to earlier explanations.

You may want to highlight important results and numbers of your lab with **bold** or *italic* text. Also, feel free to use **color** in your reports. Color coding data can make it much easier to read,

and this is easy to do since you will usually not be printing. Most lab reports will be submitted through Blackboard under the Assignments tab. This should include your report, with all data and calculations, as well as any post-lab questions, all in one file. Most simple sketches, such as force diagrams, are easily created in most word processors. (If you do not have access to an adequate word processor, a great one can be downloaded from OpenOffice.org, and can save in MSWord's .doc format.)

Feel free to bring your lab report by ahead of time and I will look it over with you. I can easily point out subtle points, and make suggestions more easily in person than I can in written form. Come either at office hours or make an appointment. Please do so at least one day before the report is due.

Lab reports have definite due dates, usually the at lab time the next week. Lab reports turned in late will be penalized about one letter grade. **No reports will be accepted more than one week late; a zero will be given for the assignment.**

Graded Reports

Graded lab reports are available with comments on Blackboard. Look at these comments so you do not make the same mistakes; as the semester progresses I will be less lenient with small errors in the lab reports. You look at graded reports by going to "grade details" where you submitted the report. Once you see the report you may need to click the "Grademark" tab at the top to see comments. You can download and print out graded reports if desired.

I will indicate any grammar and typographical mistakes I notice. Minor errors will not change your grade unless they distract from the reading of the report, but you should make every effort to write as well as possible. Structure of your writing will affect your grade, as writing logically helps you think logically.

If I say to you "I would do this..." it means just that, not that you should necessarily do the same. This is not a criticism, but a suggestion of another way to present. Often this is a style issue.

[Here](#)  is a sample report.