

Physics 180L Physics Lab Spring – 2012

Syllabus

General Information

Instructor: Marshall Liddle

Email: marshall.liddle@dri.edu

Office: LP 216

Mailbox: the TA mailboxes, one of which is labeled with my name, are around the corner from the Physics Office in the Leifson Physics Building (second floor)

Office hours: Wednesday 2:00-3:00PM; email questions to me at other times

Webpage for lab schedules and lab procedure downloads: <http://physics.unr.edu/LabsSpring.html>

Class Hours: i) Section **004**: WED, 3:00-5:00pm

ii) Section **010**: THU, 3:00-5:00pm

Class Description and Objectives:

The purpose of the physics laboratory is to allow student to witness the concepts and physical laws that are introduced in lecture. You will also be exposed to elementary laboratory techniques. Every class will have a short lecture introducing the procedures, concepts, formulas and instructions relevant to the experiment. The lecture will also cover what is expected from you and how to write your lab-report. Please don't be late. Attendance and participation is expected. Experiments will often be performed in groups, however lab reports have to be written by you and your lab partner.

Course Requirements:

Lab Etiquette:

- No FOOD/DRINKS/SMOKING/APPLYING of COSMETICS in the labs.
- Please turn off your cell phone.
- You and your partners must clean up and shut off equipment after you are finished with your lab. Failing to do so can affect your grade.
- Please report all damaged equipment so it can be replaced.
- There will be 11 lab experiments during the semester. Only 10 of the 11 labs will be graded, allowing the student to drop his or her lowest grade. Please note that *you must turn in a minimum of 9 reports in order to pass the course.*
- You are expected to read the lab experiments before class and have a printed copy of the lab with you in the class.
- You will be responsible for bringing a lab notebook to class and getting your lab notebook signed by the instructor before leaving the lab. This signature will be counted as attendance. Please refer to the handout "How to Keep a Lab Notebook" for more about lab notebooks.
- Lab reports are due the following lab period at the beginning of the lab. Each lab team of two students will turn in one report. A lab report which is one day late will have its grade docked 20%. The grade will be docked an additional 10% for each week the lab report is late.
- Late lab reports may only be turned in to your TA in person, or to my TA mailbox. The report must be stamped with the date and time by the little date stamp machine in the Physics Office. You need to plan on doing that while the Physics Office is open (generally, M-F, 8AM-5PM).

- Lab reports that contain copied or plagiarized material will be given a grade of zero. Lab reports for labs the student did not perform will be given a grade of zero. Brief sections of quoted material are allowed in your report, but only if properly cited. Citation is not required when you quote the lecture material I write on the board in class. Anything else that is not your original work, you had better cite it! Please ask me if you are unsure about how this rule applies in any particular case.
- Lab reports produced in MS Word are preferred, and neatly hand-written lab reports are also accepted. Illegible lab reports are unacceptable.
- You may turn in graphs on graph paper or printed out from a suitable computer application (Excel, etc). Hand-drawn graphs on anything other than graph paper are unacceptable.
- Follow the given format for the lab write-ups. Please refer to another handout, “On Writing a Good Lab Report,” for detailed instructions on following this format.

Attendance:

You are required to attend all the classes. If you must miss a lab due to an excused absence (illness, emergency or pre-arranged absence), you should arrange to make up the lab during a different lab session that week (the week of your absence). You should contact both instructors before attending another lab section. No more than two labs can be done in other lab sections. By department rules, if you miss three or more classes you will receive a failing grade for the lab section. There is no way to make up the labs. This means you need to attend and write reports for at least 9 labs. Lab reports that are turned in for experiments which you did not attend/perform will receive a grade of zero. You are expected to be in class on time.

Laboratory safety:

Experimental work can expose one to various kinds of hazards (electric shock, burns, cuts...). Every person working in the laboratory should be aware of his or her surroundings and situation so as to avoid possible injury. Be aware and reduce the risk of injury and/or damaging the equipment. Report any accident or potentially hazardous situation immediately to your TA.

All labs are located in the Davidson Math and Science Center, second floor.

Description of the Lab Report Format and How it is Graded

*Grading and percentage of total reports—
Out of a possible 60 points per report:*

A	B	C	D	F
A 56.0-60	B+ 52.0-53.9	C+ 46.0-47.9	36.0-42.9	below 36.0
A- 54.0-55.9	B 50.0-51.9	C 44.0-45.9		
	B- 48.0-49.9	C- 42.0-43.9		

Title Page (2): 2 points for having a separate title page, including the information below:

Title of the Experiment

Names of both lab partners:

Lab Section:

Date of Experiment:

Abstract (5): A concise statement (a paragraph or two) that summarizes the objective and states the numerical results of the experiment. This section is worth a total of 5 points.

1 point for having an abstract

2 points for summarizing objectives

2 points summarizing results and indicating whether or not the theory in question was confirmed

Theory (10): Summarize in your own words, the theory of the physics involved in the experiment. Also present the working equations and the units. The theory section should also briefly outline the procedures used in the lab in a separate sub-section. This section is worth a total of 10 points.

5 points for having a theory section

2 points for outlining procedures

1 point for stating proper units

1 point for expressing relevant equations

1 points for defining relevant terms

Data (8): An orderly display of the data, preferably in tabular form. All entries should be clearly identified and include their proper units. This section is worth a total of 8 points.

2 points for a data section

2 points original data from your work in lab

2 points for proper/clear labeling of data tables

2 points for proper units of data

Computations (10): You must clearly show the computations used to reduce the data. First write the relevant equations then give a sample calculation. Be sure to include proper units and use the correct number of significant figures. This section is worth a total of 10 points.

2 points for having a computation section

2 points for displaying relevant formula

2 points for sample computation

2 points for proper units

2 points for significant figures

Results (10):

A brief summary of your results, stating the determined value or law, along with its numerical uncertainty. Use proper units and significant figures. For example, the experimental value for “g” was found to be:

$$\text{Acceleration of gravity } g = (9.8 \pm 0.2) \text{ m/s}^2$$

Frequently you will want to compare your result (F) with an accepted value (F_0).

A good quantity to compute in this case is the “percent discrepancy” or the “Percent error” which is defined as:

$$\text{Percent - Discrepancy} = \frac{|F - F_0|}{F_0} \cdot 100\%$$

If you are comparing two values of “F” found in different ways (F_1 and F_2) find the “percent difference” given by:

$$\text{Percent - Difference} = \frac{|F_1 - F_2|}{F_M} \cdot 100\%$$

Where F_M is the mean of F_1 and F_2 . Round off percent errors and differences to two significant figures. Discuss what you found and compare this with what you had expected to find. Discuss any discrepancies. You may suggest ways in which to improve the experiment or reduce errors. Some labs procedures may include questions; answer those questions in this section. This section is worth a total of 10 points.

2 points for having a results section

2 points stating determined value

2 points for stating uncertainty

2 points for summarizing experiment and results

2 points for each question answered correctly

Graphs: 2 points proper units

2 points labeling axis

Discussion (15):

This section is a summary and discussion of your results.

2 points for having a discussion section

3 points for a summary of the whole experiment

5 points for making your case whether or not your data and results proved the theory in question

5 points for describing sources of experimental error and suggesting possible improvements in the experiment. This section is worth a total of 15 points.

Each lab has a total of 60 points.

Note: Your instructor will consider the above format important when grading your lab report. The following may be taken into consideration as well. (Worth \approx 10%)

1. Neatness
2. Composition
3. Grammar
4. Spelling
5. Thought and originality in performing and presenting the lab
6. Behavior that is disruptive to the labs (which includes but not limited to: being late to class, not leaving a clean work area for the following class...)

Bonus points may be given for finding and reporting errors in the lab procedures.

Disability statement: Any student wishing to apply for academic accommodations or adjustments is requested to inform the instructor, or contact the Disability Resource Center (DRC, Thompson, Suite 101, phone 784-6000) directly, as soon as possible to arrange appropriate actions. The DRC will be able to answer any questions regarding accommodations or adjustments.

Academic Success Services: Your student fees cover usage of the Math Center (784-443 or www.unr.edu/mathcenter/), Tutoring Center (784-6801 or www.unr.edu/tutoring/), and the University Writing Center (784-6030 or www.unr.edu/writing_center). These centers support your classroom learning; it is your right and responsibility to take advantage of their services as necessary for your academic success. Keep in mind that seeking help outside of class is the sign a responsible and successful student.

Academic Integrity: All examinations, homework, and quizzes must be your own work. Plagiarism or otherwise obtaining grades under false pretenses constitute academic dishonesty according to the code of this university. Academic dishonesty will not be tolerated and penalties can include canceling a student's enrollment without a grade, giving an F for the course or for the assignment. For more details, see the [UNR General Catalog](#).