

# Physics 151L (1106) - General Physics I Lab

## Spring – 2012

### Syllabus

#### General Information

Instructor: Zephyr McCormick

Email: [zephyr.mccormick@gmail.com](mailto:zephyr.mccormick@gmail.com)

Office: LP 222

Mail box: LP 2<sup>nd</sup> floor hallway (Zephyr McCormick)

Office hours: Thursdays 10AM-11AM (and by appointment)

Lab meeting time: Thursday 1PM – 2:50PM

Lab manuals webpage: <http://www.physics.unr.edu/LabsSpring.html>

#### 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 expect from you and how to write-up your lab-report, please don't be late. Attendance and participation is expected. Experiments will be performed in groups however final lab-reports have to be written-up individually.

#### 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 doing so can affect your grade.
- Please report all damage equipment so it can be replaced.

##### *Lab reports:*

- There will be 11 lab experiments during the semester. Only 10 of the 11 labs will be graded allowing the student to drop their lowest grade.
- You are expected to read the lab experiments before class and have a printed copy of the lab with you in the class. This will help you perform the experiment and can serve as your data sheet.
- You will be responsible to get your individual data, in your lab notebook, signed by the instructor before leaving the lab. This signature will be counted as attendance.
- Lab reports are due the following class period at the beginning of each class. Each student will turn in an individual 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.
- Lab reports that contain copied or plagiarized material will be given a zero. Lab reports for labs the student did not perform will be given a zero
- Typewritten lab reports are preferred, neatly hand-written lab reports are also accepted. Illegible lab reports are unacceptable.
- You can turn in graphs on graph paper or printed out.

Hand-drawn graphs on anything other than graph papers are unacceptable.

• Please follow the given format for the lab write-ups. This format can be found at the lab manual website.

*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. Lab reports that are turned in for experiments which you did not attend/perform will not be graded. You are expected to be to 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 situational aware of their surroundings so as to avoid possible injury. Be aware and reduce the risk of injury and/or damaging the equipment. Report any accident immediately.

*Schedule:*

2/9/2012	Orientation/Accuracy of Measurement	DMS 208
2/16/2012	Force Table	DMS 208
2/23/2012	Understanding Motion I & II	DMS 212
3/1/2012	Equilibrium of Non-concurrent Forces	DMS 208
3/8/2012	Conservation of Momentum	DMS 212
3/15/2012	Uniform Circular Motion	DMS 210
3/22/2012	SPRING BREAK	NO LAB
3/29/2012	Archimedes' Principle	DMS 208
4/5/2012	Gas Law	DMS 210
4/12/2012	Heat of Fusion	DMS 210
4/19/2012	Linear Harmonic Motion	DMS 210
4/26/2012	Standing Waves in Air	DMS 212

*Grading and percentage of total reports:*

Above

90 -100 A

80 – 89 B

70 – 79 C

60 – 69 D

Below 60 F

Have a productive semester.

*Name:*

*Lab Partners Name:*

*Lab Section:*

*Date of Experiment:*

## **Title of the Experiment**

(1 point for having a title)

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

1 point for having an abstract

2 points for summarizing objectives

2 points summarizing results

**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 sections should also **outline the procedures** used in the lab, worth a total of 10 points.

5 points for having a theory section

2 points for outlining procedures

1 points for stating proper units

1 points for expressing relevant equations

1 points for defining relevant terms

**Data (8):** An orderly display of the data, preferably in tabular form. You must including the original data sheet signed by the TA. All entries should be clearly identified and include their proper units, worth a total of 8 points.

2 points for a data section

2 points original data (signed by instructor)

2 points for proper/clear labeling of data

2 points for proper units of data

**Analysis (14):** 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, worth a total of 14 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

Graphs: 2 points proper units

2 points labeling axis

**Results and conclusion (12):**

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<sub>o</sub>). A good quantity to compute in this case is “percent discrepancy” found by:

$$\text{Percent - Discrepancy} = \frac{|F_1 - F_2|}{F_M} \times 100\%$$

If you are comparing two values of “F” found in different ways (F<sub>1</sub> and F<sub>2</sub>) find the “percent difference” given by:

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

Where F<sub>M</sub> is the mean of F<sub>1</sub> and F<sub>2</sub>. Round off percent errors and differences to two significant figures. Discuss what you found and compare with what you had expected to find. Discuss any discrepancies. One may suggest ways in which to improve the experiment or reduce errors. Some labs may include questions, worth a total of 12 points.

2 points for having a results section

2 points stating determined value

2 points for stating uncertainty

2 points for having a discussion section

2 points for summarizing experiment and results

2 points for each question answered correctly

***Grade = (total points earned / total point available) X 100***

**Note:** Your instructor will consider the above format important when grading your lab report. The following will be considered important in grading your reports (in addition to the physics):

1. Neatness
2. Composition
3. Grammar
4. Thought/Originality in presentation
5. Spelling

*Bonus point will be given for finding and reporting errors in lab manual*

*Not all labs will conform exactly to the lab report format, given above.*

*Some labs may not require a certain section of the lab format. While another lab may require an additional section be added to the write-up.*

*For nonconforming labs, check with the instructor as to what they expect for a write up.*