

PHYS 201-L Introductory Physics I LAB

Fall 2019

Dr. Johnny B. Holmes

CATALOG DESCRIPTION: PHYS 201-L Introductory Physics I LAB

Laboratory to accompany [PHYS 201](#). Corequisite: enrollment in PHYS 201.

TEXT: Lab experiment instructions in pdf form are available below under Schedule of Labs section (page 4). We encourage students to bring their mobile device to lab. Pc's will be available for those who do not have laptops or tablets.

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[office hours](#)

PREREQUISITES BY TOPIC:

1. Basic algebra, trigonometry

GOALS:

This laboratory course supplements the lecture course, so it is designed to assist you in reaching the goals of Phys 201. The additional goals of this course are:

1. To provide a hands-on experience with some of the properties of mechanics studied in PHYS 201.
2. To test the models developed in Phys 201 in the real-world environment of the laboratory, and to see how well the models work and to find their limitations.
3. To acquaint the student with lab techniques.
4. To show the limitations of experimental verification of scientific theories.

EXPERIMENTS:

1. Composition of Concurrent Forces
2. Acceleration Due to Gravity
Computer program to help with write-up is on [this page](#)
3. Acceleration along an Inclined Ramp
4. Newton's Second Law
5. Centripetal Force
6. Moments of Parallel Forces (Torque)
7. Atwood's Machine
8. Hooke's Law and Potential Energy
9. Fluids
10. Oscillations
11. The Vibrating String

* indicates these labs will have a formal write-up

GRADING: Each of the 12 lab sessions will be worth up to 15 points based on your participation and an oral report at the end of the session (180 points). Each of the three experiments marked with an * requires a written report worth up to 100 points (300 points). This makes for a total of 480 points.

A: Be present for all 12 lab sessions and accumulate at least 447 points.

B: Be present for all 12 lab sessions and accumulate at least 423 points.

C: Be present for at least 11 lab sessions and accumulate at least 379 points.

D: Be present for at least 10 lab sessions and accumulate at least 350 points.

F: Anything less than the minimum requirements for a D.

Each of the three written reports are due at the beginning of the lab period two weeks after the experiment is completed. There will be a penalty of 5 points per lab class day for each day a written report is late. Any late reports will not be accepted after the last regular class of the semester. For more information on the written reports see the guide at the bottom of the next page. Also, there is a sample written report at the end of the 1st experiment on Composition of Concurrent Forces.

Oral reports are worth 15 points maximum. **For a smooth report 14 points will normally be awarded.** Only for an especially good report will the full 15 points be awarded. If the group has to go back and check on something, points may be subtracted. If at the end of the lab not all parts are completed, points will be subtracted. If the oral report is not smooth or if incorrect conclusions are drawn, points may be subtracted. **If you arrive more than a couple minutes late, points will be subtracted based on how late you arrive.**

NOTE: Feel free to ask questions any time before you begin your formal oral report. No points will be subtracted for questions before you begin your formal oral report.

ABSENCES:

If you know you will miss a lab, you may make arrangements with the instructor before the lab to make the lab up at a later time. If you miss a lab without notice and wish to make up the lab, you may do so by Wednesday day, Dec. 4, but there will be a 5 point penalty plus 5 points per lab class day that you fail to make arrangements.

WRITTEN LAB REPORT GUIDE:

*There is a **sample lab report** at the end of the first lab experiment (Composition of Concurrent Forces) guide.*

1. Each lab report should be typed (computer assisted print is fine), or at least be clearly legible. Points will be subtracted for neatness if the report is hard to read or hard to follow. Feel free to type some of the report and hand write some (calculations are sometimes hard to type, so feel free to hand-write these).
2. Each written lab report should have the following:
 - a. Title of experiment, student name, name of partner, date of experiment
 - b. Object of the experiment (one or two sentences)
 - c. A short description of what you did in the experiment
 - d. Data (what you actually measure before calculations are performed- and **with units**). A **table** is often a good way of presenting your data.
 - e. Graphs where appropriate (with labels and slope calculations if appropriate – use graph paper or computer generated graphs and be sure to **include units** with all values and labels)
 - f. Calculations (including a statement of the equation and a sample calculation with **units**)
 - g. Statement of results with appropriate comparisons (be sure to clearly mark this; include a discussion of the meaning of each graph). A **table** is often a very good way of presenting your results that make comparisons easy to see.
 - h. Discussion of errors (experimental uncertainties) and accuracy of results
3. Use correct English grammar and spelling.

SCHEDULE FOR LABS:

	W	Aug. 21	<i>none</i>
1	W	Aug. 28	<u>Composition of Concurrent Forces</u>
2	W	Sept. 4	* <u>Acceleration Due to Gravity</u> (1 st write up) Computer help on writing up Acceleration Due to Gravity experiment is on <u>this page</u>
3	W	Sept. 11	<u>Acceleration Along an Inclined Ramp</u>
4	W	Sept. 18	* <u>Newton's Second Law</u> - Parts 1-4 (part of 2 nd write up)
5	W	Sep 25	* <u>Newton's Second Law</u> – Parts 5-6 (part of 2 nd write up)
6	W	Oct. 2	<u>Centripetal Force</u>
7	W	Oct. 9	<u>Moments of Parallel Forces (Torque)</u>
	W	Oct. 16	<i>none- Fall Break</i>
8	W	Oct. 23	* <u>Atwood's Machine</u> (3 rd write up)
9	W	Oct. 30	<u>Hooke's Law and Potential Energy</u>
10	W	Nov. 6	<u>Fluids</u>
11	W	Nov. 13	<u>Oscillations</u>
12	W	Nov 20	<u>The Vibrating String</u>
	W	Nov. 27	<i>None- Thanksgiving</i>
	W	Dec. 4	<i>Make-ups</i>

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