PHYS 201L: Newtonian Mechanics Laboratory
Syllabus- Spring 2020

Location: Trexler 274 **Time**: TH 2:50PM- 5:50PM
Instructor: Dr. Hiba Assi **E-mail**: assi@roanoke.edu
Office Hours: MWF 13:00-14:30, TH 11:00-12:00 **Office**: Trexler 264B
Open-door visits & appointments are welcome **Phone**: (540) 375-2570

Required Materials: Pre-lab materials are available online through Inquire and should be printed and completed before coming to lab. Lab handouts will also be posted and should be printed before coming to class. A bound lab notebook (sewn pages, not spiral bound) with graph paper pages and a scientific calculator are needed.

Goals: This class will reinforce and apply the theoretical concepts learned in PHYS 201 lectures, which in turn will deepen your understanding of these topics and uncover the relations between different physical phenomena. You will get to (i) work in teams and improve your collaborative skills, and (ii) develop your scientific writing skills to communicate your findings.

Learning Outcomes: Upon successful completion of the course, students will be able to:

- Conduct scientific experiments and obtain accurate data
- Discuss the results of an experiment quantitatively and qualitatively
- Identify sources of error that appear in experimental methods and
- Communicate experimental results in a coherent, well-organized, written manner

Attendance Policy/Make-up Labs: Since 20% of your PHYS 201 grade depends on the laboratory, *you must enroll in both the lecture and laboratory sections of 201*, and all experiments must be completed or your lecture final grade will be reduced a letter grade.

The lab starting and ending times are firm, although it may be possible to complete the lab before the published ending time. You will be allowed one late arrival to the lab up to 15 minutes after the starting time. Any later arrival will not be allowed, unless a prior approval was granted or to accommodate an emergency.

One missed lab may be completed during the make-up week at the end of the semester, and the report from that make-up lab is due within five days of the completed experiment.

Five percent of your laboratory grade is determined by attendance and participation, as an average of the weekly grades, based upon a ten point scale. It is expected that each student attends the lab, willing to assist with all parts of the experiment and being respectful to others and their contributions. Reductions up to five points for each of the following may be given:

failure to be on time, not actively participating in data collection and analysis, forgetting your lab notebook and calculator, failure to complete the experiment by the allotted time, and attention to your cell phone instead of the experiment.

Pre-lab Assignments: The purpose of the pre-lab assignments is to introduce the material that will be investigated during the lab, therefore pre-lab assignments are due at the beginning of the lab session. Pre-lab assignments are posted on Inquire for each of the experiments. The assignment is to be printed and completed, or the answers written on a sheet of paper and then submitted at the beginning of lab. Some of the prelab assignments contain simulations, so it is suggested that access to the simulation be tested before lab is scheduled to meet. The answers to the pre-lab will be discussed at the beginning of the lab session, so it must be received before that discussion begins in order to be worth ten points. No pre-lab assignments will be accepted after the beginning of lab, and a grade of zero will be recorded for not submitting the assignment on time.

Lab Notebooks: Each student is to purchase and bring a bound notebook with graph paper pages to lab each week. The goal of the lab notebook is to practice recording data and results in a wellorganized and legible format. Pay close attention to formatting procedures stated during the first experiment of the semester. You will create a Table of Contents on the first two pages of the notebook, and then each lab will start on the right-side page with the lab title, date, lab partners names, and page number. Results should always be clearly presented in table format and sample calculations and error analysis should be presented. Pay close attention to indicating units in all column headers and for all results. Graphs printed in lab should be pasted in the notebook and should be the correct length, so they do not extend beyond the page edge. The lab notebook part of your lab grade will be determined by the clarity and organization of your notebook.

Lab Reports: One of the course objectives is to communicate experimental results in a coherent, well-organized, written manner, and thus it is important to practice writing lab reports. Lab reports consist of four sections: Abstract (A), Introduction (I), Data and Results (R), and Discussion (D). You will practice writing full reports by focusing on these sections separately in some assignments, while other assignments will require the full report.

Some of the assignments will be group submissions (one document produced by the whole group and submitted by one of the group members), while others will be individual (each group member submits their own work/report). Most assignments will be due at 11:59 pm on Tuesday of the following week, unless otherwise indicated.

The time stamp on the upload by the server will determine when the work was submitted. Unless an extension is granted beforehand, all late items will be reduced by 10% for each 24 hour period beyond the due date/time.

Grading: All grades will be recorded on Inquire. Do not discard any graded work until the end of the semester. If there is a discrepancy between the grade recorded on Inquire and on the report, proof of the grade must be produced for the grade on Inquire to be changed.

At the end of the semester, your overall lab average will be sent to your lecture instructor. No curves will be applied to your lab grade. The final lab average will be calculated according to the following distribution:

Attendance/Participation	5%
Pre-labs	15%
Lab notebook	10%
Weekly lab sections	
Group reports	25%
Individual reports	45%

Use of Electronic Devices: Computers in the lab are networked and you are required to log into them with your username and password. Do not save any work to the lab computers unless you save it to your Z-drive or onto a personal USB device; all other drives are purged when you log out. During class, the computers in this room are to be used only for the completion of assignments directly associated with this course. You are allowed to use personal laptops and tablets, but only for the purpose of taking notes Out of courtesy to others, your phones must be on silent mode and out of reach during class. If you are engaged with your cell phone, you are not engaged with your lab partners and the experiment, and the "participation" part of your grade will be negatively affected.

Disability Support: Accessible Education Services (AES) is located in the Goode-Pasfield Center for Learning and Teaching in Fintel Library. AES provides reasonable accommodations to students with documented disabilities. To register for services, students must self-identify to AES, complete the registration process, and provide current documentation of a disability along with recommendations from the qualified specialist. Please contact Laura Leonard, Assistant Director of Academic Services for Accessible Education, at 540-375-2247 or by e-mail at aes@roanoke.edu to schedule an appointment. If you have registered with AES in the past and would like to receive academic accommodations for this semester, please contact Laura Leonard at your earliest convenience to schedule an appointment.

Academic Integrity: The Academic Integrity (AI) policy at Roanoke College will be thoroughly followed in this course, and I expect you to abide by all the outlined rules to avoid any questionable conduct. Although students working within the same group will have the same data, recording of the data into the lab notebook is to be completed individually. Group members may share Excel graphs created during lab time in order to be secured in each student's lab notebook. Error values are to be calculated individually in lab notebooks, as well as sample calculations using the data. Results should be recorded in each student's notebook. Individual lab reports must be the student's original work, except for shared data. If I become aware of a possible violation of these guidelines, I am obligated to report it to the Academic Integrity committee. Student resources on the AI policy can be found online at:

https://www.roanoke.edu/inside/az_index/academic_affairs/academic_integrity/resources_for_students

Class Environment: Each member of this class is valued and is expected to 1) treat everyone else with respect and 2) contribute to a welcoming and inclusive environment, 3) equally contribute to the work during lab sessions and in group work.

PHYS 201 Laboratory- Spring 2020- Tentative Schedule

Date	Lab Topic	Report
January 16	Course Policies Experiment 1: Density	Data and Results (Group)
January 23	Experiment 2: Uniform 1D Motion	Data and Results (Individual)
January 30	Experiment 3: Projectile Motion	Abstract (Group)
February 6	**Exam 1 Review**	
February 13	Experiment 4: Forces and Equilibrium	Abstract (Individual)
February 20	Experiment 5: Frictional Forces	Introduction (Group)
February 27	Experiment 6: Circular Motion	Introduction (Individual)
March 5	**Spring Break- No Lab!**	
March 12	Experiment 7: Conservation of Energy	Discussion (Group)
March 19	**Exam 2 Review**	
March 26	Experiment 8: Conservation of Momentum	Discussion (Individual)
April 2	Experiment 9: Angular Motion	Full Report (Individual)
April 9	**Exam 3 Review**	

April 16	**Make-up Week**	Assigned Report due within 5 days of completed lab