Physics 201 Lab: Newtonian Mechanics Laboratory
Spring 2025

Course Meeting: Trexler 274
Instructor: Mrs. Bonnie Price
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Office: Trexler 179
Office Phone: 540-375-2408
Office Hours: M W: 11:00 – 3:00 pm
Other Times by appointment

Required Materials:

Pre-lab materials are available online through Inquire and should be completed ***before*** coming to lab in your lab notebook. Lab handouts will be posted on Inquire, and you are required to print and bring the handout to lab, or read the handout on your laptop, but not the computer in the lab. A bound lab notebook (sewn pages, not spiral bound or glued) with graph paper pages is needed, as well as a scientific calculator and a pencil or pen.

Goals:

This course will reinforce and apply the theoretical concepts introduced in Physics 201 lecture, while practicing report writing and your ability to clearly communicate accurate results to your colleagues and instructor. New experimental techniques will be introduced as you work in teams and improve your collaborative skills.

Intended Learning Outcomes:

Upon completing this 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 Physics 201 grade depends on the laboratory, *you must enroll in both the lecture and laboratory sections of 201.* Furthermore, you may *only* attend the lab section for which you are registered, unless you have explicit permission to attend the other session.

The lab starting and ending times are firm, although it may be possible to complete the lab before the published ending time. Late arrivals to the lab, up to 15 minutes after the starting time, will result in a lower participation grade. 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 three days of the completed experiment.

It is expected that each student attends the lab, willing to assist with all parts of the experiment, being respectful to others and their contributions, and bringing with them all of the needed materials. Lab participation is included in the grading rubric for each experiment. Students will work in groups of two or three depending on the class enrollment, with the initial selection made by the students. Lab partners will be changed during the semester.

Three exam review sessions are scheduled. It is expected that each student will attend for one hour and work the given problems to help prepare for each of the in-class exams.

Attendance will be taken, but no grade will be assigned to these review sessions and no work will be submitted for those weeks.

Out of courtesy to other students, please do NOT come to lab if you have a temperature of 100.4°F or higher, or other contagious symptoms.

Pre-lab Assignments:

The purpose of the pre-lab assignment is to introduce the material that will be investigated during the lab and to encourage reading of the experimental instructions before attending lab, therefore pre-lab assignments are due at the ***beginning*** time for the lab session, completed in your lab notebook. Prelab assignments are posted on Inquire for each of the experiments. Some of the prelab assignments contain simulations, so it is suggested that access to the simulation be tested with adequate time for completion before lab's starting time. The answers to the prelab will be initialed in your lab notebook upon arrival and the prelab grade will be part of the lab grading rubric. The answers to the pre-lab will be discussed at the beginning of the lab session.

Lab Notebooks:

Each student is to purchase and bring a bound notebook with graph paper pages to lab each week. A well-organized notebook is easily detectable at a glance, so pay close attention to formatting procedures stated during the first session of the semester. The goal of the lab notebook is to practice recording data in a well-organized and legible format, as well as recording answers to questions and summarizing the results. 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, and page number. Data should always be clearly presented in table format with correct significant digits, uncertainties, and units, and recorded in the notebook when taken.

Lab Reports:

Since one of the course objectives is to communicate experimental results in a coherent, well organized, written manner, it is important to practice writing lab reports. Most physics lab reports consist of four sections: *Abstract, Introduction, Data and Results*, and *Discussion.* You will practice writing full reports by focusing on these sections separately in some assignments, while other assignments will require the full report.

All reports will be individually written and submitted from shared data. A separate document will describe the format and content of the report sections. **Assignments will be due at 11:59 pm on Friday of the same week as lab, unless otherwise indicated.**

The time stamp placed 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 and time.** As a result, after 10 days, no report will be accepted.

Academic Integrity:

Although students working within the same group will have the same data, each student is expected to record the data in their lab notebook, complete their own data analysis, and write and submit their own individual report. All calculations and error analysis are to be completed individually, without sharing of files.

Individually submitted lab reports must be each student's original work, except for shared data. All reports electronically submitted will come through Turnitin and not through email. The college's academic integrity policies are stated on the webpage at this link https://www.roanoke.edu/inside/a-z_index/academic_affairs/academic_integrity and you should familiarize yourself with the college's policies. **If any report submitted through Turnitin is flagged as having content from another student, except for similar data, or having computer generated content from AI sources, then the student will be reported to the Academic Integrity Council. Using another source, other than your own brain, and submitting it as your work, is considered cheating.**

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 in order 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 determined as the average of the nine experiment grades.

Electronic Devices Usage Policy:

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 the class, the computers in this room are to be used only for the completion of assignments directly associated with this course. You may bring and use your personal laptop to access the lab handout instructions in lieu of printing them. **Computers, including laptops, are not to be used to check email or access the Internet for personal reasons during class**.

Out of courtesy to others, **all cell phones should be silenced** upon arrival to class and **should be out of reach during class.** If you are engaged with your cell phone, then you are not engaged with your lab partners and the experiment, and the participation part of your grade will be negatively affected. You have been warned, so no additional warning is needed. Also, MP3 players, cameras and other personal devices are not to be used during class. Personal laptops and tablets may be used as directed.

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. If you have registered with AES in the past and would like to receive academic accommodations for this semester, please contact me after completing the necessary forms.

Class Environment:

No food or drinks are allowed in the lab, except for containers with screw top lids. **Each member of this class is expected to treat everyone with respect, contribute to a welcoming and inclusive environment, and equally contribute to the work during lab sessions. I will**

gladly honor your request to address you by an alternate name or gender pronoun, if you advise me of this preference early in the semester so that I may make the change to my records.

Tentative Course Outline:

Date	Lab Topic	Report
January 14	Course Policies Experiment 1: Graphical Analysis	Individual MS Excel File and Graph
January 21	Experiment 2: Uniform One-Dimensional Motion	Individual Data and Results
January 28	Experiment 3: Forces and Equilibrium	Individual Data and Results Sample Calculations
February 4	**Exam 1 Review**	
February 11	Experiment 4: Projectile Motion	Individual Abstract
February 18	Experiment 5: Frictional Forces	Individual Abstract
February 25	**Exam 2 Review**	
March 4	**Spring Break – No Lab!**	
March 11	Experiment 6: Circular Motion	Individual Abstract
March 18	Experiment 7: Conservation of Energy	Individual Introduction
March 25	**Exam 3 Review**	
April 1	Experiment 8: Linear Momentum	Individual Discussion
April 8	Experiment 9: Conservation of Momentum and Energy	Full Individual Report
April 15	**Make-up Week**	Required Report for Missed Lab