

Physics 202 Lab: Electricity and Magnetism Laboratory Fall 2024

Meeting: Trexler 273, TH 1:10 – 4:10 pm
Instructor: Mrs. Bonnie Price
Email: price@roanoke.edu

Office: Trexler 264B
Office Phone: 540-375-2408
Office Hours: M: 11:00 – 4:00 pm
W: 1:00 – 4:00 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 you may read the handout on your laptop. A bound lab notebook (sewn pages, not spiral bound) with graph paper pages is needed, and a pencil or pen.

Goals:

This course will reinforce and apply the theoretical concepts introduced in Physics 202 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 202 grade depends on the laboratory, *you must enroll in both the lecture and laboratory sections of 202*. 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. Dr. Robb will conduct these review sessions and will answer your questions, so attend if you want to take advantage of the review. No grade will be assigned to these review sessions and no work will be submitted for those weeks.

Currently, students are not required to wear a face covering/mask over the mouth and nose while in academic buildings, unless you are recovering from COVID or choose to do so. **Do NOT come to lab if you are sick with coronavirus or other contagious symptoms. Please contact me before lab concerning any health issues that prevent you from attending.**

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. You may use the lab notebook from Physics 201 Lab, if it contains at least 20 unused pages, and may continue the Table of Contents for this semester's experiments on the **second page of the notebook.** A well-organized notebook is easily detectable at a glance, so pay close attention to formatting procedures stated in the handouts. The goal of the lab notebook is to practice recording data in a well-organized and legible format, as well as answering questions and summarizing results. If you are using a new notebook, create a Table of Contents on the first two pages of the notebook, stating Experiment Title and Page Number for the beginning page of the experiment. Each lab will start on the right-side page with the lab title, date, and page number. Photos of your lab notebook pages will be used as a report grade for some experiments this semester, so neatness and correct formatting procedures will be graded, along with content.

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.

Most 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 the Monday following lab, unless otherwise indicated. Some reports will be submitted at the end of lab.**

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, recording of the data into the lab notebook is to be completed individually, written in table format. **Each**

student is to record data in their notebook BEFORE ANY ANALYSIS begins. This allows for ALL students to engage in the participation of the experimental procedure and collection of data. Once data collection is complete, each student will analyze the data using MS Excel on their laptop. No files are to be shared between lab partners. Each analysis should be saved as a MS Excel file on your laptop, with the experiment name in the title. Some of these files will be submitted as reports, through Turnitin, before the ending time of the class. If the analysis has not been finished by the ending time, the file is to be submitted with reduction in the grade due to incompleteness.

Turnitin identifies similarities between reports and produces a similarity score, as well as a score indicating sections that were AI (Artificial Intelligence) generated. **If Turnitin identifies that your report was copied from another student or AI generated, the violation will be submitted and reviewed by the college's Academic Integrity Council. Using another source, other than your own brain, and submitting it as your work, is considered cheating.** You are responsible for the college's academic integrity policies as stated on the webpage: https://www.roanoke.edu/inside/a-z_index/academic_affairs/academic_integrity .

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, and you will need your laptop to analyze the data using MS Excel. **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. Other personal devices, except for laptops and your cell phone to take and submit photos, are not to be used during class.

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
September 5	Course Policies Experiment 1: Standing Waves in Strings	MS Excel Spreadsheet
September 12	Experiment 2: Air Column Resonance	Group Abstract
September 19	Experiment 3: Electric Field Mapping	Introduction
September 26	Review for Exam 1 on September 27	
October 3	Experiment 4: RC Time Constant	Abstract
October 10	Experiment 5: Ohm's Law	MS Excel Spreadsheet
October 17	Experiment 6: Electric Circuits	Discussion
October 24	Experiment 7: Magnetic Fields	Questions
October 31	Review for Exam 2 on November 1	
November 7	Experiment 8: Magnetic Field of Current Loop	Data and Results
November 14	Experiment 9: Electromagnetic Induction	Questions
November 21	Review for Exam 3 on December 4	
November 28	Thanksgiving Break	
December 5	Make-up Week	Report Required for Experiment