WINTHROP UNIVERSITY- PHYS 212L Course Syllabus
Department of Chemistry, Physics, Geology and the Environment

Semester: Spring 2026 **Course:** PHYS 212L- Physics with Calculus I Laboratory
Credit hours: 0 **Co-requisite:** PHYS 212

Laboratory Meeting Time and Place: Mondays 2-4:50 (S001), Sims 205.

Professor: Dr. Fatima Amir
Office: 203, Sims, **Office Hours: W 1 - 3, or by appointment**.
Phone: 323 4935, E-mail: amirf@winthrop.edu

Textbook: Giancoli- Physics For Scientists and Engineers with Modern Physics, 4th Edition, Pearson.

Lab Score: The lab score (25% of PHYS 212) will come from lab reports and activities.

Students need to register for one of the lab sections, PHYS 212L.

Cell phones and tablets are not allowed in class

Course Description:

PHYS 212L is the laboratory component to accompany PHYS 212 which deals with mostly electricity and magnetism. Experiments in heat, electricity, magnetism, and optics will be conducted. This course will be used to incorporate the General Education Writing Component, where students will write lab reports with conclusions, a minimum of 20 pages of writing.

Course Objectives:

- Develop an understanding of physics' role as the most basic of the sciences.
- Demonstrate an understanding of the history of scientific discovery.
- Learn the introductory physics concepts associated with electricity, magnetism and optics.
- Gain an understanding of physics' role in technology and in everyday life and to discuss the strengths and limitations of science.
- Learn how to design and carry out introductory physics experiments.
- Learn how to use computers for data collection & analysis and graphing.
- Draw conclusions for the experiments and write laboratory reports.

General Education Requirements: PHYS 212 and the co-requisite PHYS 212L together fulfill four hours of general education requirement for natural sciences. Listed below are the seven

fundamental student's learning outcomes for natural science courses as well as examples of how they will be fulfilled in PHYS 212 and 212L.

Students will be:

1. Conversant with a few fundamental concepts from among the three main areas of natural science, including earth, life, and physical sciences. (*e.g., electricity and magnetism, and optics)*
2. Able to apply the scientific methodologies of inquiry. (*e.g., experiments and investigations in the PHYS 212L laboratory)*
3. Able to discuss the strengths and limitations of science. (*e.g., experimental error and analysis in the PHYS 212L laboratory*)
4. Able to demonstrate an understanding of the history of scientific discovery. (*e.g., topics and devices are introduced with historical perspectives)*
5. Able to discuss the social and ethical contexts within which science operates. (*e.g., environmental and health hazards of new devices and materials and sharing of knowledge)*
6. Able to communicate about scientific subjects including (lab courses only) the defense of conclusions based on one's own observations. (e.g., *PHYS 212L laboratory reports*)
7. Able to discuss the application of scientific knowledge to the social sciences and to non-scientific disciplines. (*e.g., application of technology in everyday life)*

Attendance and Participation: The attendance policy described in the Winthrop University undergraduate catalog will be followed. Students are encouraged to attend all the labs and to actively take part in laboratory activities.

Academic Dishonesty/Plagiarism: Collaboration on assignments is welcome, but please keep in mind that your final, turned-in work should be your own and not copied. However, no form of cheating/plagiarism will be tolerated in this class. If anyone is suspected of academic dishonesty, I will privately speak with them in an attempt to reach a solution to whatever the problem is. If anyone is without doubt determined to be cheating on a given assignment/test and no resolution can be offered, *negative credit will be given*. In extreme cases, the Department and/or College administration will become involved. The policy on student academic misconduct is outlined in the "**Student Conduct Code Academic Misconduct Policy**" in the online *Student Handbook*: (http://www2.winthrop.edu/studentaffairs/handbook/StudentHandbook.pdf)

Course Communication:

1. Be sure to check your Winthrop email account daily, as I may send out course related announcements that will come *only* to Winthrop email addresses.

2. If you email me, please be sure to use your Winthrop email account I will respond to email within 24 hours except from Saturday morning through Sunday afternoon when my response may be slower.

Students with Disabilities/Need of Accommodations for Access: Winthrop University is committed to providing access to education. If you have a condition which may adversely impact your ability to access academics and/or campus life, and you require specific accommodations to complete this course, contact the Office of Accessibility (OA) at 803-323-3290, or accessibility@winthrop.edu. Please inform me as early as possible, once you have your official notice of accommodations from the Office of Accessibility.

No use of generative AI tools permitted: In this course every element of the class assignments must be fully prepared by the student. The use of any generative AI tools for any part of your work will be treated as plagiarism. If you have questions, please contact me

Rules for the laboratory:

1. You must read the web-link and the relevant materials from the textbook before the lab period and be prepared for the laboratory.
2. You will work in a group of two. Both partners should actively take part in collecting the data and in the experimental process.
3. At the end of your lab work you need to return all the laboratory equipment to the appropriate places where you took them.
4. You need to handle the equipment carefully, giving special attention when warranted.
5. When you leave the laboratory, you need to make sure the laboratory table is clean and free of any materials.
6. Do not miss any laboratory. **You will receive "0" for all missed laboratories**.
7. Lab reports are due at the end of the lab period, unless advised otherwise by the instructor.

LAB SCHEDULE

Lab #	**Week**	**Experiment**
1	Jan. 26	Heat
2	Feb. 2	Charge and Field
3	Feb. 9	Resistance
4	Feb. 16	Ohm's Law
5	Feb. 23	Capacitor

6	Mar. 2	Meters
7	Mar. 9	Induction and Permeability Constant
	Mar. 16-20	Spring Break-No Labs
8	Mar. 23	Oscilloscope
9	Mar. 30	e/k constant
10	Apr. 6	DC Motors
11	Apr. 13	Spherical Mirrors and Lenses
12	Apr. 20	Interference and Diffraction Instructions and Data
13	Apr. 27	Spectra

Lab Reports and Conclusion:

At the completion of each lab, you are required to turn in a lab report. You may work with your partner(s) to complete most of the write-up**.**

The conclusion must be written as the last piece, and attached after the data tables and graphs. It should state things that are unique for your investigation, which can be accomplished by including values of the experimentally determined physical quantities. Just remember that you cannot write your conclusion without completing your experiments or investigations**. General statements as "I have determined the densities of given solids" are not acceptable.**
You may start your conclusion by re-stating the purpose with appropriate changes. You should explain as completely as possible what goes through your mind that leads you to your conclusion.

A summary of the experiment need to be included along with the conclusion on the data collected. You need to briefly state (do not repeat procedure) how you conducted the experiment and collected the data. You may discuss some of the difficulties you had, and suggestions for improvement. Describe your reasoning using physics terminology and principles.

You are encouraged to be creative with your conclusions and explain whether or not your results are accurate. If the results are not close to the accepted values, you are expected to give reasons for any discrepancies and **percent errors. You need to explain the sources of your errors; they can be from measurements, or from a defective instrument or anything that did not work well. They cannot be from calculations, and a statement as "human error" is not acceptable.**

The conclusion section is the part of the lab, which is the most important to check for your comprehension of the topic.