# ASTR/PHYS 212L-10 #19025

## Syllabus Fall 2023

## Course Information

Instructor: Robert Wright

Email: bobbywave@fullerton.edu

Office Hours: Tuesday 10:30am – 11:30pm in MH-612

Physics Office: (657)278-3366

The lab meets on Tuesday at 11:30am-2:20pm in room MH-664.

## Course Description and Objectives:

The purpose of the laboratory component of a physics course is to enhance the students’ understanding of physical principles learned in the lectures by performing experiments to demonstrate the validity of these principles. The experiments we will perform require the same steps used in a university research lab: careful observation, scientific measurement, interpretation of data, and communication of the results.

## Course Materials:

The manuals for this laboratory are provided on the [Physics Department lab schedules website](http://physics.fullerton.edu/department/lab-schedules), and are also available on the computers at each lab station. You should print and read the current week’s lab manual in advance and bring it with you to each lab.

You will utilize MS office word an excel frequently. Office 365 is free for students along with other software on the [CSUF IT Student Software Website](https://www.fullerton.edu/it/students/software/).

Note the PCs in each lab will wipe all data 10 minutes after the end of each class time. You should setup cloud save software to save and transfer your completed labs. Dropbox is also available for students.

## Course Learning Goals:

In laboratory courses, students will learn to ask scientific questions, formulate hypotheses, design and conduct experiments, and analyze data.

* Students will collect, analyze and interpret data and information.
* Students will apply mathematics to scientific investigation for the purpose of quantifying results and drawing conclusions.
* Students will demonstrate the ability to work collaboratively to collect and interpret data and draw conclusions.
* Students will communicate scientific observations, results and conclusions in clear terms both verbally and in writing.

## Course Procedures:

Each of the experiments will be performed by a team of 2 students, unless a group of 3 is assigned by the instructor due to missing students or odd class numbers. Larger groups are not allowed.

In the first class, you will select a partner to work with throughout the semester. The members of each team work together to set up the equipment and record the data. The members may discuss the experiment, required calculations and graphs, and the results obtained. Partners will turn in a lab report together, but may be graded independently based on effort observed by the instructor e.g. tardiness, or being frequently off-task.

## Lab Rules:

Failure to comply with the following rules may result in failing lab grades:

* Every student must arrive to class on time and complete the experiment in the scheduled class time, submitting it before the end of the class. Except in extraordinary circumstances.
* Every student must familiarize themselves with the lab beforehand by reading over the lab manual before class.
* Every student is responsible for leaving his or her lab station neat and with all the proper lab equipment placed as it was when entering the room.
* There is no food allowed in the lab.

## Laboratory Reports:

Each pair of lab students will prepare a brief laboratory report for each experiment following the guidelines set in the first lab class. The lab reports are due at the end of each lab. Use the first person in your reports. Sections of the lab report must be clear. Each laboratory experiment is worth a maximum of 10 points. Laboratory reports must be complete, tidy, and legible. Points may be deducted for each of the following reasons:

* Missing sections of the lab report
* Incomplete measurements (including missing units)
* Incomplete or illegible calculations
* Incomplete, unclear, or obviously wrong graphs when required (including missing labels)
* Missing, incorrect, or illegible answers to the questions in the text
* Missing, obviously wrong, or illegible final result
* Incorrect argument in discussion or conclusion
* Untidy laboratory station
* Abuse of apparatus
* Failure to follow Lab Rules
* Failure to follow the instructions given in the laboratory text or by the instructor
* Failure to equally participate in performing the experiment
* Clarity of writing
* Incorrect grammar

## Anatomy of a Laboratory Report:

Write the name of the lab, your name and your partner's name in a header on the first page.

Lab reports must have each of the following sections:

1. Calculations and data: For every part of the experiment, and in the order given by the manual, show the relevant calculations for the lab, the tables made and other data.
2. Answers to Lab Questions: Answer all the questions asked in the lab manual unless otherwise instructed to do so. You do not need to include checkpoints in your report.
3. Conclusion: Discuss the final result of the experiment and any conclusions you may have drawn from the experiment. Discuss any possible sources of difference and whether your results made sense. Follow the week 1 Report guide if available to your course.

Clearly label each section. You may add other sections as you see fit. Use the first person in your report, you are reporting on what you actually did.

## Grading

Letter grades will be assigned as follows:

A+: 97%-100%

A: 94%-96%

A-: 90%-93%

B+: 87%-89%

B: 84%-86%

B-: 80%-83%

C+: 77%-79%

C: 70%-76%

D: 60%-69%

F: 0%-59%

## Grade Breakdown

20% - Tests and Quizzes

80% - Lab Reports

There are 12-14 labs (see course schedule) scheduled for the semester, weighted equally. Three individually graded Quizzes scheduled throughout the semester will account for 20% of your grade. Unexcused absences will result in a grade of 0 for that lab.

## Other Information

### Information for students with special needs

All students have a right to accommodations for documented special needs via the Disability Support Services Office, UH 101, (657) 278-3117.

### Emergency information

The following links to information on what to do in the event of a campus emergency: [Prepare webpage](http://prepare.fullerton.edu/evacuationprocedure/Default.asp) Emergency calls: dial 911. Non-emergency calls: (657) 278-2515

24 Hr. recorded emergency information: (657) 278-0911, (657) 278-4444

### Academic Dishonesty

 [Academic Dishonesty UPS300-021.pdf](http://www.fullerton.edu/senate/documents/PDF/300/UPS300-021.pdf)

### General Education

This course meets the GE plan B.3 requirements (see UPS 411.201).

Learning Goals for B.3 Laboratory Experience

Students taking courses in subarea B3 shall

1. Apply scientific methodology through active experimental methods and experiences (laboratory/activity).
2. Evaluate the validity and limitations of theories and scientific claims in interpreting experimental results.

### GE Course Writing Requirement:

This course requires the General Education writing requirement described in [UPS 411.201](http://www.fullerton.edu/senate/documents/PDF/400/UPS411-201.pdf). For each experiment in this course you or your lab team will be required to turn in a written laboratory report. You will be required to organize and express complex data and ideas about physics in these reports. Reports will be graded by the instructor based on not only your understanding and explanation of the material and the correctness of your responses, but also the clarity and readability of your writing. The instructor will provide timely suggestions for improvement and/or means of remediation for your writing. Note that your writing competence will be used in determining your report grade.

## Tentative Schedule: Astronomy/Physics Lab 2XX

The schedule for this course can be found at the [Department lab schedules page](https://physics.fullerton.edu/department/lab-schedules/)

Take a screenshot or two of your labschedule page showing the entire schedule and paste it here and/or on the next page(university requirement)