

# *Physics 4B (Fall 2022)*

## *Syllabus*

### **Instructor Information**

**Instructor:** Joe McCullough, Ph. D.  
**Office:** Room 826A  
**Telephone:** 479-6521  
**E-mail:** [jomccull at cabrillo dot edu](mailto:jomccull@cabrillo.edu)

**Office Hours:** Tues. 8:45 – 9:15; 12:45 – 1:30  
Wed. 9:30 – 10:45  
Thur. 12:45 – 2:30  
*Also by appointment.*

**PLC Hours:** Tues. 1:30 – 2:45  
(room 834) Wed. 12:45 – 3:00

### **Course Information**

**Class Meetings:** Lecture (room 804) T, W, Th 11:10 – 12:25  
Lab (room 802) M 8:00 – 11:05 or 11:15 – 2:20 or 2:30 – 5:35  
PLC (room 834) at least 50 minutes drop-in

**Text:** *Fundamentals of Physics* (9<sup>th</sup> Edition), Halliday, Resnick, and Walker

**Class Website:** <http://joe-mccullough.com/physics/physics4b>

### **Student Learning Outcomes:**

- 1) Analyze and solve problems using the concepts, equations and methods of electricity and magnetism in both independent and collaborative settings.
- 2) Investigate physical phenomena experimentally using appropriate equipment and methods, and make valid comparisons with theoretical predictions.
- 3) Clearly communicate results of scientific inquiries in both oral and written form.

## Grading Policy

Course work will be weighted as follows:

Class Participation	5%
PLC Activities	10%
Labs	10%
Homework	10%
Quizzes	15%
Celebration 1	15%
Celebration 2	15%
Final Celebration	<u>20%</u>
	100%

<b>Grade cutoff levels:</b>	A	90%
	B	80%
	C	70%
	D	60%

These cutoff levels may drop but they **will not** rise. I do not grade on a curve so you are competing only with yourself. I encourage you to work in small groups with other students as much as possible.

**Class Participation:** Your attendance and eager participation in the class will help you learn, and thus it should also help your grade. In lecture, we will be using a remote controlled student response system (clickers) that will record your responses to various multiple-choice questions that I will ask during class. Your class participation grade will be based on the percentage of these questions that you have answered, regardless of whether or not your answers were correct.

**Note:** *You may be dropped from this course if you miss seven classes.*

**PLC Activities:** The drop-in Physics Learning Center / STEM Center (room 834) will be open every day. You are required to complete PLC activities that will take approximately 50 minutes each week. These activities are designed to support analytical and conceptual learning of the material and **should be worked in small groups** for best learning. To get credit for the PLC activities each week, you must show your work to a tutor or instructor in the PLC and have them initial a sign out sheet. ***You must also record your hours every single week on the STEM log in computer.***

**Note:** I also encourage you to work on your homework assignments in small groups in the PLC/Stem Center whenever possible.

**Lab Reports:** Active participation and attendance in lab is mandatory. Please take lab notes in ink on loose sheets of paper while in lab. Labs will be collected on the following Monday at the beginning of lab. Most of the labs you turn in will be semi-formal labs in which you will answer various questions contained in the lab write-up. There will also be 2 formal lab reports. The **Lab Report Guidelines** handout describes the format you should use for these reports, which should include names (you and your partners), title, date, experimental procedure, data organized into tables or graphs (may be printouts from Excel or other program), calculations/results and a discussion/conclusion.

***Note: You will automatically be dropped from this course if you miss two labs.***

**Homework:** Questions and problems from the text will be assigned and collected approximately once a week. Your success in the class will depend largely on the effort that you invest in these. I encourage you to work on the homework assignments in small groups, however, make sure you write up your answers individually.

Assignments must be placed on the instructor's desk *before* class begins on the due date. Assignments turned in after that are considered late. If you cannot attend class, arrange to have a friend turn in your problem set or use one of your two NQA coupons. Please use the format described in the **Homework Guidelines** handout to get full credit. The homework solutions are posted on the course website.

**Quizzes:** A 15-20 minute quiz will be given at the beginning of class on the day that homework is turned in. Each quiz will test you on the concepts and problems covered in class, in lab, in the PLC activities, and in the homework. You will do well on the quizzes as long as you attend every class, focus on understanding the concepts as well as the equations, and keep up with the homework. Quizzes will be closed book but you are allowed a 4'' by 6'' index card full of notes and equations.

**Celebrations:** There will be two celebrations and a comprehensive final celebration. The celebrations will consist of approximately 30% conceptual questions and 70% problems. They will cover **all** course material including textbook readings, lectures, labs, homework assignments, quizzes, and PLC activities. Celebrations will be closed book, but you will be allowed to bring one 8.5'' by 11'' sheet of paper filled with notes and formulas. A written excuse (medical, legal, family emergency, etc.) must be provided if a celebration is missed – preferably prior to the celebration.

## Expected time commitment:

You should expect to spend about 16 hours per week (inside and outside of class) studying Physics 4B. Spending less time than this will decrease your chances of doing well in this course.

**In class:** Lectures (3 hours 45 minutes)  
Lab (3 hours)  
PLC (50 minutes)

**Outside of class:** Reading textbook (2 hours)  
Homework (4 hours)  
Studying (2 hours)

## Miscellaneous:

### **NONDISCRIMINATION and ACCESSIBILITY NOTICE:**

The District is committed to equal opportunity in educational programs, employment, and all access to institutional programs and activities. The District, and each individual who represents the District, shall provide access to its services, classes, and programs without regard to national origin, religion, age, gender, gender identity, gender expression, race or ethnicity, color, medical condition, genetic information, ancestry, sexual orientation, marital status, physical or mental disability, pregnancy, or military and veteran status, or because he/she is perceived to have one or more of the foregoing characteristics, or based on association with a person or group with one or more of these actual or perceived characteristics.

Students needing accommodations should inform the instructor. As required by the Americans with Disabilities Act (ADA), accommodations are provided to insure equal access for students with verified disabilities. To determine if you qualify or if you need assistance with an accommodation, please contact the ACCESSIBILITY SUPPORT CENTER (Formerly DSPTS), Room 1073 (upstairs in the Library), (831) 479-6379 or (831) 479-6370.

### **Policy and Attendance:**

Quizzes and exams are based on information presented in lecture so attendance is critical to your success. ***You may be dropped from this course if you miss seven classes.***

It is also imperative that you arrive exactly on time. It is rude to your fellow students and to me when you are late. Repeated tardiness, according to the Cabrillo College guidelines, may be defined as disruption, and disruptive students may be dropped at the instructor's discretion. Students tardy a total of six times may be dropped from the course.

## Policy on Academic Dishonesty:

I assume that the student is familiar with Cabrillo College's policy on academic dishonesty, which states that cheating or plagiarism is "prohibited conduct." In this class, cheating is considered to be copying any other source but your own, including looking at someone else's paper during a quiz or exam.

Although I highly encourage students to work together in small groups on homework assignments, the solutions to each problem **must be** written up individually.

Copying someone else's work will result in a zero on the assignment or exam for the first offense and an F in the course for the second offense.

## Policy on Cell Phone Usage:

There is a strict no cell phone policy during lectures and labs. If you chose to violate this policy by using your cell phone to text, check email, and/or surf the web, you will receive a slip of paper similar to the one below. You will then have a choice of either leaving class for the day or losing 20% off of your class participation grade at the end of the semester.

### *Violation of Cell Phone Policy*



You are receiving this paper because you have chosen to violate the No Cell Phone Policy by using your cell phone during class or lab.

If you are receiving this during lecture, you have the choice of either leaving class immediately for the day or losing 20% off of your class participation grade at the end of the semester.



If you are receiving this during lab, you will lose 20% off of your grade for this lab.

## Policy on Late Assignments:

Assignments (HW, lab reports, ...) must be turned in by the beginning of class on the day they are due. Any assignment turned in after that time is considered late and will be marked down 50%. Late assignments must be turned in by the next class meeting. After that, no late assignments will be accepted.

You will get two NQA (No Questions Asked) coupons similar to the one below that you may use at any time during the semester. These coupons will allow you to turn in a HW assignment or lab report up to one day late without penalty.

<b>NQA Coupon 1</b> <b>No Questions Asked</b>	
<small>This coupon entitles you to turn in one assignment up to one meeting day late without penalties. May be used for homework or lab reports.</small>	
Print name _____	
Assignment _____	
Sign here _____	

### **TBA (To Be Arranged) Hours:**

Physics 4B requires 50 minutes per week of arranged hours to be fulfilled in The Physics/Engineering Learning Center (PLC) in Room 834. It is the students' responsibility to record their attendance by signing in each time they attend the PLC. The instructor will collect these hours periodically. These hours are required, tracked, and the assignments graded. Arranged hours are class time and all students are expected to meet this number of hours per week to fulfill the requirements of this course.

### **PLC Policies and Procedures:**

- TBA hours (i.e. PLC assignments) must be worked on cooperatively in small groups of 2 – 4 students.
- PLC exercises and experiments must be completed and signed off between 8:00 am and 5:00 pm during the times that an instructor is available. The times are posted online (see PLC schedule) and in the PLC.
- Students must sign in on the log-in computer when they enter the PLC and sign out when they leave.

All PLC exercises and experiments are posted on the Physics 4B web site at:

[http://joe-mccullough.com/physics/physics4b/4b\\_plc.html](http://joe-mccullough.com/physics/physics4b/4b_plc.html)

The weekly schedule of topics for TBA assignments is listed below.

<b>Week #</b>	<b>Weekly TBA Assignments</b>
Week 1	Introduction to Physlets; 4B Syllabus
Week 2	Electrostatics
Week 3	Electric Fields
Week 4	Gauss' Law
Week 5	Electric Potential
Week 6	Partner Review for Celebration 1
Week 7	TBA
Week 8	Current and Resistance
Week 9	Circuits
Week 10	Magnetic Fields
Week 11	Partner Review for Celebration 2
Week 12	TBA
Week 13	Induction and Inductance
Week 14	Alternating Current
Week 15	Partner Review for the Final Celebration