

University of California San Diego
Physics 2CL • Spring 2019
Syllabus

Instructor: Prof. **Julio** Barreiro

Email: barreiro@ucsd.edu

Office Hours: Monday, 11:00 am – 12:00 pm, Mayer Hall 4531

Class Meets: **Monday 10:00 am - 10:50 am - YORK 2722**

Lab TA Coordinator (LTAC): **Marco** (Man-Ho) Tang, Physics Grad Student

Email: mht016@ucsd.edu

Office Hours: Monday, 12:30 pm – 2:30 pm, 2544 Mayer Hall (lab room)

Lab Meets: Once a week in one of the following sections (**2544 Mayer Hall**)

Tuesday	Wednesday
A01 9:30 am - 12:20 pm	A04 9:00 am - 11:50 am
A02 12:30 pm - 3:20 pm	A05 12:00 pm - 2:50 pm
A03 3:30 pm - 6:20 pm	A06 4:00 pm - 6:50 pm

Teaching Assistants (TAs) :

A01: Mohammed Answar, Aswin (afm007@ucsd.edu) BioEng

Qin, Mingde (m3qin@ucsd.edu) MSE

A02: Mohammed Answar, Aswin (afm007@ucsd.edu) BioEng

Le, Thy (tnl015@ucsd.edu) ECE

A03: Jain, Alind (aljain@ucsd.edu) ECE

Qin, Mingde (m3qin@ucsd.edu) MSE

A04: Mohammed Answar, Aswin (afm007@ucsd.edu) BioEng

Qin, Mingde (m3qin@ucsd.edu) MSE

A05: Jain, Alind (aljain@ucsd.edu) ECE

Le, Thy (tnl015@ucsd.edu) ECE

A06: TBD

Text

- **Required:** Official Physics 2CL Lab Manual (available at the Bookstore)
- **Optional (maybe online):** *An Introduction to Error Analysis*, John R. Taylor, 2nd Edition (available at the Bookstore)

Highly encouraged

- **iClickers**

Course exam date: Mon, June 3rd, 10:00-10:50 am, YORK 2722 (in class).

Course Objectives: By the end of this course a successful student will be able to...

- Design experiments that implement some physical behavior
- Estimate, measure, and analyze errors present in an experiment
- Predict and fit equations describing expected types of behavior to data with Matlab
- Apply methods above to fundamental concepts of electricity and magnetism
- Construct basic circuits, measure the relevant currents and voltages, and solve basic circuit problems

Grading Breakdown: The following items determine the numeric score for the course

- Lab 0 (5 pts)
- Labs 1-5 (16 pts)
 - Homework (2 pts)
 - Quiz (2 pts)
 - Lab Report (10 pts)
 - Lab participation grade (2 pts)
- Lab 6 (26 pts)
 - Homework (2 pts)
 - Quiz (2 pts)
 - Lab Report (20 pts)
 - Lab participation grade (2 pts)
- Lab exam (15 pts)
- Course exam (15 pts)

The lab participation grade is to encourage you to engage more actively in the lab: be on time, no idling, no phone use, clean up the table at the end, write down data into the lab manual properly, etc.

The lowest scores on Labs 1-5 will be dropped. This means the lowest individual score of HW, Quiz, and Lab report, respectively, will be dropped from your grade. The maximum total score is $125 = 5 + 16 \cdot 4 + 26 + 15 + 15$.

Curving

The letter grades for the class will be assigned based on the numeric scores. Systematic differences in grading criteria between different graders are partly compensated with a correction factor. This factor will be the same for all students whose labs are graded by the same grader and it will be based on the difference between the average numeric score of these students and the average numeric score of the entire class. **Thus, in the determination of your grade, your point total isn't as relevant as how you're doing relative to your grader's scale, so always ask your grader the average and standard deviation of each lab report.** For example, a student getting a 7 on his/her lab report under a grader whose average is 5 is doing much better than a student getting an 8 under a grader whose average is 9. The student with a 7 would receive a higher grade in the end.

Homework

In Labs 1-5, and in the first part of Lab 6, there will be a short homework assignment due at the beginning of the lab. It will consist of 1-2 problems posted on the TritonEd webpage. The schedule of homework assignments can be found below in the overall schedule towards the end of the syllabus.

Clickers

Clicker questions will be posed during the lectures for your benefit. They will not be graded, and you are **not** required to purchase clickers. However, they will aid you understand the content of the lecture.

Quizzes

In the beginning of Labs 1-5, and in the first part of Lab 6, there will be a 15-minute quiz on that lab's materials. You are expected to prepare for each lab by reading the lab manual ahead of time and by attending the lecture. The quizzes are intended to test your knowledge of the relevant material.

Lab Reports

The bulk of your numeric score in this course is derived from the lab reports you complete after each lab. The lab reports start with a few "worksheet" questions related to the concepts covered in that lab. After answering these questions, you are expected to present an in-depth analysis of the data collected and experiments performed in that lab. In that part of the report, you will be using data analysis and error propagation techniques learned in the lectures. The last part of the report is a discussion question, which asks you to go beyond what was covered in lab and demonstrate your in depth understanding of the material of the lab. **For a detailed guide of how to write lab reports see the "Lab Report Guidelines" form on TritonEd.**

Lab Exam

In the last (10th) week of the quarter, the lab time will be dedicated to a practical exam, in which you will be asked to characterize a "black box" circuit and identify what it contains. Each student will do this lab exam alone and will be expected to submit a report by the end of the assigned time. For full instructions, see the lab exam manual on TritonEd.

Course Exam

On the last lecture of the class you will be taking an exam with multiple choice question. Be sure to bring a red F-289-PAR-L scantron, a calculator, and a pencil. A printed equation sheet will be provided. The exam will cover the material of the lectures and labs.

Missed Labs + Late Work

Makeup labs will not be offered. The lowest dropped grade is primarily meant to accommodate for cases of emergency, when a student cannot make it to the lab. Late work will not be accepted, unless there is a prior arrangement with the grader.

Attendance and Lab Scheduling:

Unofficial section switching is not allowed and any issues regarding section scheduling should be handled officially by the Physics department administration.

Please read the Physics Department Lab Enrollment and Attendance Policies on the TritonEd class website and below.

Email Policy

You should email the following people only in limited cases.

- *The instructor or the LTAC:* When you have questions regarding course policies.
- *Your Lab TA and grader:* When you have a specific question about a grade you received and would like to discuss it.
- *The Physics Department Virtual Advising Center:* For administrative questions regarding section scheduling and enrollment.
http://physics.ucsd.edu/students/undergrad/currentgrad_listadvisor.php

All other questions you have regarding issues on lab reports, quizzes, lectures, the final, etc., should be handled on the discussion boards on TritonEd. (See below)

Discussion Boards

The LTAC for the course, Marco (Man-ho) Tang, will rely heavily on the discussion boards on TritonEd to handle questions throughout the course. Questions will naturally come up, and he would like them all to be processed through the discussion board. If you have a question, go there and see if your question is already up or, even better, if it has already been answered. If not, go ahead and make a new post with your question. You are also encouraged to help others with issues, if you know the answer.

What to Bring to Lab

Please bring the Academic Integrity and Lab Safety Policies, printed out and signed, to the first lab (Lab 0). Otherwise, in addition to the work you have to turn in that week, all you need to bring to the class is the 2CL lab manual, a pen/pencil, and a calculator.

Students with Disabilities

Students requesting accommodations and services for this course due to a disability need to provide a current Authorization for Accommodation (AFA) letter issued by the Office for Students with Disabilities (OSD) prior to eligibility for requests. Receipt of AFAs in advance is necessary for appropriate planning for the provision of reasonable accommodations. OSD Academic Liaisons also need to receive current AFA letters if there are any changes to accommodations. For additional information, contact the Office for Students with Disabilities: 858-534-4382 (V); 959.534.9709 (TTY) – reserved for people who are deaf or hard of hearing; or email: osd@ucsd.edu. OSD Website: <http://disabilities.ucsd.edu>.

Advice on how to do well in this class

- Stay mindful of what's going on in lab beyond just the bare minimum of collecting all the data and filling in every line in the lab manual. The lab reports are easiest to write, and the final is most approachable, when your mindset in the lab is to understand, not just what you're doing, but why you're doing it. So always consider the purpose behind different analyses, and how you'd explain them to a friend.
- Be in close contact with your grader to quickly get a feel for how they want your lab reports done. Learn their rules, figure out what they are asking for and deliver.
- Consider that this class is meant to train you on experimental methods beyond the actual labs you're doing. As you go through these labs, which are focused on electricity and magnetism, adopt the mindset for how you could apply these procedures to any experiment or an electronics/power circuit building or troubleshooting task.
- Take good advantage of the LTAC's office hours. Come prepared with questions but do not expect the LTAC to write your lab report for you. The LTAC is very happy to help but will try to push you in the right direction rather than handing you the answer. Your goal in going to the LTAC with questions should be to learn how to handle questions on your own when they come up in the future.

Course Schedule

Week #	Date	Lecture	Lab	Due in Lab
Week 1	Mon 4/1	Lecture 1: Intro, Errors		
	Tue 4/2 - Wed 4/3		Lab 0: Matlab and Capstone Training	Signed Academic Integrity and Lab Safety Policies
Week 2	Mon 4/8	Lecture 2: Experimental Methods and Ohm's Law		
	Tue 4/9 - Wed 4/10		Lab 1: Ohm's Law	Lab 0 Assignment HW 1
Week 3	Mon 4/15	Lecture 3: Statistics, Capacitors		
	Tue 4/16 - Wed 4/17		Lab 2: Capacitors	Lab Report 1 HW 2
Week 4	Mon 4/22	Lecture 4: Kirchoff's Laws		
	Tue 4/23 - Wed 4/24		Lab 3: Kirchoff's Laws	Lab Report 2 HW 3
Week 5	Mon 4/29	Lecture 5: Inductors		
	Tue 4/30 - Wed 5/1		Lab 4: Inductors	Lab Report 3 HW 4
Week 6	Mon 5/6	Lecture 6: Magnetic Fields		
	Tue 5/7 - Wed 5/8		Lab 5: Magnetic Fields	Lab Report 4 HW 5
Week 7:	Mon 5/13	Lecture 7: RLC Circuits		
	Tue 5/14 - Wed 5/15		Lab 6 Part 1: RLC Circuits	Lab Report 5 HW 6
Week 8	Mon 5/20	Lecture 8: Driven RLC Circuits		
	Tue 5/21 - Wed 5/22		Lab 6 Part 2: Driven RLC Circuits	
Week 9	Mon 5/27	Memorial Day NO LECTURE OR LAB THIS WEEK		
	Tue 5/28 - Wed 5/29			
Week 10	Mon 6/3	Course exam during normal lecture hour		
	Tue 6/4 - Fri 6/5		Lab exam during normal lab hour	Lab Report 6