

## PHYS 152L-5 E&M

**Course:** Phys 152L, Section 5, E&M, Spring 2019  
**Lab Schedule:** Thursday, 9:00am-11:50am (Group I)  
**TA:** Siqi Wang  
**Email:** siqiwang@hawaii.edu  
**Office:** WAT431  
**Office Hours:** WAT421, Tuesday & Thursday, 3pm to 4pm  
**Website:** <http://go.hawaii.edu/boG>  
**Text:** Harris, General Physics Laboratory II: Electricity and Magnetism Optics: Physics 152L and 272L, 2nd Ed.  
<https://he.kendallhunt.com/product/general-physics-laboratory-ii-electricity-and-magnetism-optics-physics-152l-and-272l-ebook>

### Student learning outcomes:

- To understand the importance of experiments as the basis of the scientific method.
- Better understand physics concepts covered in lecture by seeing their application in experiments.
- To obtain experience in the techniques employed by scientists in all fields for analyzing data and drawing conclusions from "real world" experiments.
- Report your result in a scientific fashion.

### Preparation for the lab:

- Prepare a notebook:
  - On the book's front cover print your name, class, section, and name of your TA.
  - This book will be used to record the data.
- Use a pen for all data recording and quizzes.
- Read the lab instructions for the upcoming lab and bring the lab manual to class.
- Bring a scientific calculator, ruler, and tape.
- Wear closed shoes.

### What to expect:

- Each student is expected to perform all experiments. Please see the rules for make-up experiments below.
- The class will start most times with a 10-15min quiz, potentially followed by a quick discussion of the answers.
- This is followed by a ~30min lecture from the TA. It is expected that the students interact a lot and ask questions. This will help to be more efficient when conducting the lab and writing the lab report.
- For the remaining ~2h, the students will conduct the experiments in groups of two and start the data analysis. Students should pay close attention to the instructions of the TA and the lab manual. Careful experimentation will result in better data. If something is unclear the TA is ready to help.
- Students change lab partners every two weeks.
- Nobody should leave without the TA signed data tables.

### Lab report:

The idea of the report is that you could go back to report in a few months and would be able to repeat the measurements without any further instructions by only using your own report.

- Start with writing the experiment's title and your partners' name/s.
- List the date you are writing the report.
- Structure:
  - **Objectives:** The purpose of the lab. The objective part should be very short; it should not be longer than two or three lines. Write it in your own words.
  - **Notes:** Write and explain any derivations of formulas you used in this experiment as well as assumptions we made to modify these formulas.
  - **Procedure:** Write in your own words each step of your experiment. Better not copy the procedure from the lab manual. Draw a sketch of any apparatus and label the different components used in this experiment.
  - **Data input:** Will include tables, graphs (Before printing any graph ask your TA to check the plot), and charts properly labeled with units. Please tape all extra papers to your notebook. The data should contain the information that was given and measured during the experiment (radii, current, voltage, resistance, etc.).
  - **Calculations:** Transform your data into results. Write the formulas you are going to use in your calculation, explain what is that formula for, and then use it. Write **units** for all physical quantities. Not using units results in a deduction of points for your lab report.
  - **Final Results:** Write all your final results as follows: result  $\pm$  uncertainty. Every measurement that you take has to be given with an error. Giving a measurement without the uncertainty has no physical meaning. Write **units** for all physical quantities. Not using units results in a deduction of points for your lab report.
  - **Discussion of errors:** Discuss the systematic and statistical errors involved in your experiment.
  - **Conclusion:** Write a conclusion in your own words. Explain whether the experiment fulfilled its objectives.
  - **Questions:** Answer the questions assigned at the beginning of every class.
- The recorded data will be signed off by the TA. Data that were not signed off by the TA will not be accepted. Unsigned data tables will not be accepted in your report and potentially leads to 0 points for the report (which is equivalent to missing one lab).
- The lab reports make up 60% of the grade. If a lab report is not submitted the grade for the experiment is 0%.
- Penalties for late reports:
  - 1 week – 15% off
  - 2 weeks – The report will not be accepted → **results in one missed lab**

#### Quiz:

- The quiz will contain about five questions from the current lab and the previous lab.
- Be prepared for those quizzes by reading the relevant chapters from your manual. The quizzes make up 40% of the grade.

#### Grading:

Final grades will be curved over all sections. The typical outcome over all sections is approximately 25% A's, 40% B's, 35% C's and below. Every experiment carries the same weight for the grade calculation.

### **Cheating:**

- No cheating and copying is allowed. This includes copying data from another student.
- The groups will collaborate to conduct the experiment and also to start the initial analysis in the lab room together. However, the final analysis at home has to be conducted individually.
- No collaboration for quizzes.
- A student who was caught cheating would be given a zero for that lab/quiz (may also lead to a direct fail of the course).

### **Being late:**

- This lab has a strict late policy. Missing parts of the lecture can potentially result in safety hazards and damaging behavior to the equipment.
- It is within the discretion of the TA to decide if a late student will be allowed to conduct the experiment or fail the experiment.
- Generally, being late by more than 30min automatically results in a missed experiment. This lab has to be made-up if the late arrival was excused with a reasonable explanation. Without a reasonable explanation the lab cannot be made up and the student receives 0% for the experiment.

### **Missed Labs:**

- To receive full credit, a student must inform (email or call) his/her TA before or immediately after the missed lab. The student is responsible for arranging for a make-up experiment. The TA will assist the student with this process. The TA is not responsible for contacting the student after a missed lab to schedule a make-up experiment.
- If the TA was not contacted on the same day and the student cannot produce a doctor's note or any other evidence the lab cannot be made up. In this case, the student receives 0% for the experiment.
- A total of **two** make-up experiments is allowed. Any further misses, will result in failing the course. Special circumstances requiring to soften this rule should be brought to the attention of the TA as soon as possible and will be decided on a case-by-case basis. The lab will be either made up in the other section of the TA or with another TA.
- In case of scheduling conflicts, it is the student's responsibility to make time for the make-up experiment. It cannot be expected that the TA will conduct the experiment exclusively with the student on their own time. Special arrangements will be found for missing a lab in the last week of the semester.
- On a case-by-case basis, the TA will decide if she/he will provide a make-up quiz as well.
- Making-up of missed labs will be in the same week or by the following week. If a student is excused for a longer period special arrangements will be decided on a case-by-case basis. This should be brought to the attention of the TA as soon as possible.
- **Only one lab can be missed without making it up to be able to pass the class.** This will result in a 0% score for both quiz and report. A second lab that is missed and not made up (see rules for make-ups above) will result in failing the course.

## Lab Schedule by Week:

Group I starts in PSB 111

Group II starts in PSB 112

Week		Group 1	Group 2	Holidays
1/14	1/18	LED	LED	
1/21	1/25	Electric Field Mapping	Electric Deflection	1/21 MLK Day
1/28	2/1	Electric Deflection	Electric Field Mapping	
2/4	2/8	Oscilloscope	DC circuit	
2/11	2/15	DC circuit	Oscilloscope	
2/18	2/22	Capacitors	Capacitors	2/18 Presidents' Day
2/25	3/1	Magnetic Field Mapping	Magnetic Deflection	
3/4	3/8	Magnetic Deflection	Magnetic Field Mapping	
3/11	3/15	Induction	Induction	
3/25	3/29	Driven Oscillations	Natural Oscillations	3/26 Kuhio Day
4/1	4/5	Natural Oscillations	Driven Oscillations	
4/8	4/12	Refraction of Light	Geometric Optics	
4/15	4/19	Geometric Optics	Refraction of Light	4/19 Good Friday

The University of Hawai'i is committed to providing a learning, working and living environment that promotes personal integrity, civility, and mutual respect and is free of all forms of sex discrimination and gender-based violence, including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence, and stalking.

If you or someone you know is experiencing any of these, the University has staff and resources on your campus to support and assist you. Staff can also direct you to resources that are in the community.

Here are some of your options:

### **Anonymous and Confidential**

If you wish to remain Anonymous, speak with someone Confidentially, or would like to receive information and support in a Confidential setting, contact the confidential resources are available at [www.manoa.hawaii.edu/titleix/resources/#confidential](http://www.manoa.hawaii.edu/titleix/resources/#confidential)

or

If you wish to remain Anonymous, speak with someone Confidentially, or would like to receive information and support in a Confidential setting, contact:

### **Lesbian, Gay, Bisexual, Transgender (LGBT) Student Services**

Lesbian, Gay, Bisexual, Transgender and Intersex (LGBTI) Student Services strives to maintain a safe and inclusive campus environment that is free from harassment and discrimination. The office provides direct services to students of the University of Hawai'i at Mānoa to confidentially discuss or seek advocacy and support for mistreatment due to their actual or perceived sex, gender identity, gender expression, or sexual orientation.

Cameron Miyamoto  
Queen Lili'uokalani Center for Student Services, Office 211  
2600 Campus Road  
Honolulu, HI 96822  
(808) 956-9250  
email: [lgbtq@hawaii.edu](mailto:lgbtq@hawaii.edu)  
web: <http://manoa.hawaii.edu/lgbt/>

### **Office of Gender Equity**

The Office of Gender Equity offers direct services to victims and survivors of sexual harassment and sexual assaults. Brief descriptions of services offered are available here.

Jenna Friedman  
Queen Lili'uokalani Center for Student Services, Office 210  
2600 Campus Road  
Honolulu, HI 96822  
(808) 956-9499  
email: [geneq@hawaii.edu](mailto:geneq@hawaii.edu)  
web: [manoa.hawaii.edu/genderequity](http://manoa.hawaii.edu/genderequity)

### **Prevention, Awareness, and Understanding (PAU) Violence Program**

Prevention, Awareness, and Understanding (PAU) Violence Program exists to inspire, educate, and empower students and campus communities to build safe living-learning environments, end interpersonal violence, and encourage holistic well-being in ways that are supportive, collaborative, student-centered, and strengths-based. PAU Violence Program staff provides direct services to all University of Hawai'i at Mānoa students including crisis response, safety planning, academic support, and referrals to campus and community resources.

Jennifer Barnett Leslie Cabingabang  
Queen Lili'uokalani Center for Student Services, Office 211  
2600 Campus Road  
Honolulu, HI 96822  
(808) 956-8059  
email: [uhmpau@hawaii.edu](mailto:uhmpau@hawaii.edu)

### **Student Parents At Mānoa (SPAM)**

Student Parents At Mānoa (SPAM) seeks to increase the visibility of and resources for student parents at UH Mānoa as they pursue education while parenting. SPAM staff provide advocacy, support, and referrals for pregnant and parenting students to help them succeed in their educational goals.

Teresa Bill  
Queen Lili'uokalani Center for Student Services, Office 211  
2600 Campus Road  
Honolulu, HI 96822  
(808) 956-8059  
email: [gotkids@hawaii.edu](mailto:gotkids@hawaii.edu)  
web: [manoa.hawaii.edu/studentparents/](http://manoa.hawaii.edu/studentparents/)

### **Counseling and Student Development Center (CSDC)**

The Counseling and Student Development Center (CSDC) offers support to UHM students, staff, and faculty to assist with personal, academic, and career concerns. All services are confidential and most are free of charge for Mānoa students. They also offer free consultation to faculty and staff on personal and student-related issues as well. CSDC office hours are from 8:00 a.m. to 4:30 p.m., Monday through Friday. They also offer immediate walk in appointments for urgent or emergency/crisis services during their regular daily hours.

Queen Lili'uokalani Center for Student Services, Office 312  
2600 Campus Road  
Honolulu, HI 96822  
(808) 956-7927  
email: [uhmcsdc@hawaii.edu](mailto:uhmcsdc@hawaii.edu)  
web: [www.manoa.hawaii.edu/counseling/](http://www.manoa.hawaii.edu/counseling/)

### **University Health Services Mānoa (UHSM)**

The University Health Services Mānoa (UHSM) is staffed by physicians, nurse clinicians, nurses, and other support staff, and offers a wide range of medical services and programs to UH Mānoa students, with many of the services also available to UH Mānoa faculty and staff and students from other UH campuses. Services include general medical care on a walk-in basis; women's health, sports medicine, psychiatry, and dermatology clinics by appointment; pharmacy and clinical laboratory; and student training, employment and volunteer opportunities.

1710 East West Road  
Honolulu, HI 96822  
(808) 956- 8965  
[hawaii.edu/shs/](http://hawaii.edu/shs/)  
Reporting

If you wish to Report an incident of sex discrimination or gender-based violence including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence or stalking as well as receive information and support, contact:

Dee Uwono  
Director and Title IX Coordinator  
Hawai'i Hall, Office 124  
2500 Campus Road  
Honolulu, HI 96822  
(808) 956-2299  
[t9uhm@hawaii.edu](mailto:t9uhm@hawaii.edu)

As a member of the University faculty, I am required to immediately report any incident of sex discrimination or gender-based violence to the campus Title IX Coordinator. Although the Title IX Coordinator and I cannot guarantee confidentiality, you will still have options about how your case will be handled.

My goal is to make sure you are aware of the range of options available to you and have access to the resources and support you need.

For more information regarding sex discrimination and gender-based violence, the University's Title IX resources and the University's Policy, Interim EP 1.204, go to [www.manoa.hawaii.edu/titleix/](http://www.manoa.hawaii.edu/titleix/)