

Syllabus

Physics 152, Section 9, Mondays, 9:30 - 12:20, Group 1

Office Hours in WAT 421, Wednesdays, 2:30-4:30

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<http://go.hawaii.edu/05G>

Spring Semester 2020

1 Expectations

1.1 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.
- Learn how to report your result in a scientific fashion.

1.2 Preparation for the lab

- Bring a notebook to record your 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.
- Have access to a calculator, on a phone, a laptop, or an actual calculator.

1.3 During Lab

- 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.
- Every lab is 2:50h long. You are expected to be on time and you are expected to stay until the end of the lab and to not leave early. If you finish early work on the lab report.
- A new random group partner will be assigned every two weeks.
- Nobody should leave without the TA signed data tables.

2 Lab Report

2.1 Cleanliness/Readability/Clarity/Formatting (3 Points)

Take pride in your work. A good lab report should be easy to read and understand. I should be able to read your words easily and follow your work easily as well. Your calculations should not resemble scratch work. Also, your lab should resemble the formatting suggested here. For example the content of your lab should appear in the same order it appears here.

2.2 Title Group Members (1 Point)

Write the title and your group members names at the beginning of each lab. Keep in mind that your group members will change every two weeks.

2.3 Background (6 Points)

This section should be a brief overall description of the lab that leaves the reader with a clear understanding of what the purpose of the lab is. At the end of the background the reader should have a clear understanding of what was set out to be accomplished.

Points	
2	Makes sense, has correct grammar, sentences flow together to form complete thoughts.
2	Is related to the hypothesis
2	Introduces the important variables used in the calculations

2.4 Procedure (5 Points)

The focus of the procedure should be to leave the reader with the ability to reproduce the experiment.

Points	
2	Leaves the reader with a clear step by step process that would allow a reader to reproduce the experiment.
1	Describes the methods used to collect all relevant data.
1	Includes relevant diagrams for experimental setups.
1	Is reasonably concise and does not include incorrect/extraneous steps.

2.5 Hypothesis (4 Points)

In this class we will always be making mathematical hypothesis of the form

$$H : Q_1 - Q_2 = 0, \quad (1)$$

Reject if:

$$Z = \frac{|Q_1 - Q_2|}{\sqrt{\delta Q_1^2 + \delta Q_2^2}} \geq 2.$$

In english this means that we are always making the prediction that 2 quantities Q_1 and Q_2 to within the uncertainties in the measurements. In (1) Q_1 and Q_2 should be two quantities that should be the same, for example a value of gravity as measured in lab and the value of gravity as measured by National Institute of Standards and Technology. δQ_1 and δQ_2 are the uncertainties associated with Q_1 and Q_2 . An explanation of why this is our hypothesis can be found in the analyzing data for physics handout.

Points	
2	All necessary hypothesis are present and written appropriately
2	There is an accurate description of each variable that appears in a hypothesis

2.6 Data (8 Points)

Points	
2	All data and uncertainties has been recorded
2	All data and uncertainties have the correct units
2	Data has values that are close to the 'correct' values for the lab
2	Data is reported in a sensible manner. Tables where necessary etc.

2.7 Graphs (6 Points)

Points	
2	All graphs should have appropriately labeled axis
2	Axis labels include correct units
2	Graphs that are used to obtain a measurement that is used in calculations should include a caption that states which values will be used

2.8 Calculations and derivations (10 points)

This section should include a derivation of the symbolic equations used to calculate every quantity that will appear in the final results. This includes the variables that appear in the hypotheses.

2.9 Final Results and hypothesis testing (6 points)

Points	
2	Each variable that is used in the hypothesis tests are reported with proper units
2	A z-score is computed for each hypothesis
2	Any additional final results are reported with an uncertainty and proper units

2.10 Conclusion and discussion of error (8 points)

Points	
1	Each hypothesis is appropriately passed or failed
3	List all significant systematic errors that occurred. State which of the four types of systematic error each one is (instrumental, environmental, observational, or theoretical).
2	There is an explanation for exactly how the source of error effected the final results. If your results are too big/small how did the error(s) identified lead to a result that was too big/small?

2.11 Questions (3 points)

Answer the end of lab questions which I will ask after each lab

3 Quizzes

- The quiz will occur first thing during the lab
- 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 percent of the grade.

4 Grading

Final grades will be curved over all sections. The typical outcome over all sections is approximately 25% A, 40% B, 35% C and below. Every experiment carries the same weight for the grade calculation. The labs account for 60% of your grade and the quizzes account for 40% of your grade.

5 Code of conduct

5.1 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 failure of the course).

5.2 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.

5.3 Missing 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.

6 Lab Schedule

Date	Lab	Room
1/20	MLK Day	N/A
1/27	Simple Electric Circuit with a LED	PSB 112
2/3	Measuring Electric Deflection with a Cathode-Ray Tube	PSB 111
2/10	Operation of an Oscilloscope	PSB 112
2/17	Presidents Day	N/A
2/24	Capacitor	PSB 112
3/2	Magnetic Field Mapping	PSB 111
3/9	Charge-to-Mass Ratio of Electrons	PSB 112
3/23	Inductor	PSB 111
3/30	Natural Oscillations with a RLC Circuit	PSB 112
4/6	Driven Oscillations with a RLC Circuit	PSB 111
4/13	Snell's Law and the Lensmaker's Equation	PSB 112
4/20	Refraction Studies with a Prism and Spectrometer	PSB 111

7 Student Services

The University of Hawaii 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.

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. Some options that are available are included here.

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

7.2 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 Hawaii at Manoa to confidentially discuss or seek advocacy and support for mistreatment due to their actual or perceived sex, gender identity, gender expression, or sexual orientation.

Camaron Miyamoto

Queen Liliuokalani Center for Student Services, Office 211

2600 Campus Road

Honolulu, HI 96822

(808) 956-9250

email: lgbtq@hawaii.edu

web: <http://manoa.hawaii.edu/lgbt/>

7.3 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 Liliuokalani Center for Student Services, Office 210

2600 Campus Road

Honolulu, HI 96822

(808) 956-9499

email: geneq@hawaii.edu

web: manoa.hawaii.edu/genderequity

7.4 Prevention, Awareness, and Understanding (PAU) Violence Program

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 Hawaii at Manoa students including crisis response, safety planning, academic support, and referrals to campus and community resources.

Jennifer Barnett Leslie Cabingabang

Queen Liliuokalani Center for Student Services, Office 211

2600 Campus Road

Honolulu, HI 96822

(808) 956-8059

email: uhmpau@hawaii.edu

7.5 Student Parents At Manoa (SPAM)

Student Parents At Manoa (SPAM) seeks to increase the visibility of and resources for student parents at UH Manoa 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 Liliuokalani Center for Student Services, Office 211

2600 Campus Road

Honolulu, HI 96822

(808) 956-8059

email: gotkids@hawaii.edu

web: manoa.hawaii.edu/studentparents/

7.6 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 Manoa 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 Liliuokalani Center for Student Services, Office 312

2600 Campus Road

Honolulu, HI 96822

(808) 956-7927

email: uhmcsdc@hawaii.edu

web: www.manoa.hawaii.edu/counseling/

7.7 University Health Services Manoa (UHSM)

The University Health Services Manoa (UHSM) is staffed by physicians, nurse clinicians, nurses, and other support staff, and offers a wide range of medical services and programs to UH Manoa students, with many of the services also available to UH Manoa 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/

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

Hawaii Hall, Office 124

2500 Campus Road

Honolulu, HI 96822

(808) 956-2299

t9uhm@hawaii.edu