



General Physics I Lab  
PHYS 2051  
Fall 2017  
August 28<sup>th</sup> – December 16<sup>th</sup>  
Thursday  
7:30am – 10:30pm  
LAB – AC 212

**NO FINAL** – unless you want one...

Welcome to PHYS 2051 – General Physics I Lab!

We will be using standard lab practices

- Experimental goals will be presented at the BEGINNING of lab
- You will be given the rest of the period to meet these goals and record your observation
- A summary lab report will be due at the BEGINNING of the next lab period.

\*\*The lecture (PHYS 2050) is a separate course

### INSTRUCTOR INFORMATION

**Instructor:** Nathan J. Dawson  
**Email:** [ndawson@hpu.edu](mailto:ndawson@hpu.edu)  
**Office:** AC 311C  
**Office Phone:** 236-7909  
**Office hours:** MW 10:30am - 12:30pm

### COURSE INFORMATION AND REQUIREMENTS

**Course meeting times and location:** All classes will meet in **AC 212 (Hawaii Loa Campus)**  
**Required Resources:** Sovereign, grid lined lab book can be purchased on or off campus.

### COURSE DESCRIPTION

**Course Description:** This is the laboratory component of PHYS 2050. A physics lab is where the basic behavior of reality is studied by proscribing and conducting properly constructed experiments. Experiments in mechanics will be conducted and recorded in your experimental journal. Scientific method will be discussed in instructor and student discourse.

**Prerequisite:** Completion of or concurrent enrollment in PHYS 2050.

**Method of Instruction:** This is a hands-on laboratory course

**Learning Outcomes:**

By the end of the course, students should be able to:

- Follow experimental procedures laid out for them. (This is assessed by Lab reports.)
- Describe the physics of basic classical mechanics systems. (This is assessed by Lab reports.)
- Communicate scientific observations. (This is assessed by Lab reports.)
- Demonstrate competency with scientific set up and mathematical relationships. (This is assessed by Lab Reports.)
- Learn to evaluate the quality of science being performed by a third party. (This is assessed by Experiment Reports.)

ASSESSMENT, GRADING SCHEME, and COURSE SCHEDULE
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There are 11 labs, all related to carrying out experiment concerning the lecture material. Your grade will breakdown as follows:

**Lab Journal** will consist of your notes and data from participation in the laboratory. This is what you will use to generate your summary reports. It will be turned in at the end of the term for participation. Remember, science is messy! Don't worry about making mistakes in here. This is where you want to record "what happened." Your summary report will be the one with the final clean analysis.

**Summary lab reports** are to be completed and turned in one week after the completion of a lab requiring a summary lab report. I will designate the lab as requiring a summary lab report at the beginning of that laboratory assignment.

Participation/Lab journal	20%
Labs (5 reports – 16% each)	80%

A	90 – 100%
B	80 – 89%
C	70 – 79%
D	60 – 69%
F	0 – 59%

**Course Schedule:** (Student learning objectives for each chapter are assessed on the respective labs)

Date	Topic	Activities & Assignments
08/31	Overview of expectations; Lab notebook and lab format	Syllabus, safety agreements
09/07	Units, Precision and Error	LAB 1 – Measurement, uncertainty, propagation of error, graphing, & linear regression
09/14	Binning, Variation, Reference, Control	LAB 2 – Darts, statistics, and the normal distribution
09/21	Inertia, Acceleration, Local Gravitation	LAB 3 – Motion in 1D
09/28	Motion in two dimensions	LAB 4 – Projectile motion
10/05	Frames, Vectors and Hooke's Law	LAB 5 – Forces as vectors
10/12	Static and dynamic friction	LAB 6 – Friction
10/19	Work done by gravity	LAB 7 – Work and kinetic energy
10/26	Spring potential energy	LAB 8 – Conservation of mechanical energy
11/02	Momentum	LAB 9 – Elastic and inelastic collisions

11/09	Torque and moment of inertia	LAB 10 – Torque and rotational motion
11/16	Simple Harmonic Motion	LAB 11 – Spring-mass oscillations
11/23		Thanksgiving – No lab
11/30	Summarize – wrap up	Turn in your laboratory journals

## INSTRUCTOR POLICIES AND EXPECTATIONS

### Attendance and Participation:

- One must attend to do each lab.
- Each student will keep their own lab journal even if working in groups.
- Participation will be assessed throughout the lab by interaction with the instructor. When asked: “What have you discovered?” or “What have you learned?” A response is required.

**Instructor availability:** I will be available in my office after each laboratory. If this is not an option, students are encouraged to visit any of the four office hours and send emails to me using [ndawson@hpu.edu](mailto:ndawson@hpu.edu). I will check email at least once per day and respond as necessary within 48 hours. If you do not receive a response in this time-frame, please assume that I did not receive the email.

**Make-up Work:** All absences, periods of time when a student is unable to complete course work due to a reason such as illness, military duty, or family emergency, must be coordinated with the instructor. Students should make every effort to notify the instructor **PRIOR** to the absence. But if you can't (or don't), please notify the instructor as soon as possible after the absence. This record of absences will be important if an **incomplete** grade and course extension are necessary due to extended absences during the course. Contact me.

**Late Work:** Assigned work is due as noted on the schedule. Labs will be docked 1 point (out of 16 total points) for each day late.

**Withdrawal:** If you need to make any changes to your registration, including withdrawing from or adding courses, return to your HPU advisor for assistance.

For specific deadlines regarding dropping the course with a withdrawal “W” grade and with no GPA penalty, but possible loss of some or all of the tuition. Pay particular attention to the dates associated with withdrawing from the course. It could determine whether you get any tuition back in the event you need to drop the course.

**Incomplete:** Students who are unable to complete course requirements due to circumstances beyond their control (e.g. Military duty, illness, natural disaster ...) can make a written application to me with documentation for an incomplete “I” grade and complete the course requirements after the end of the course.

**Extra Credit:** There is no extra credit in this course.

**Academic Honesty:** All Students are expected to adhere to the University's policies regarding academic honesty. The policy of Hawai'i Pacific University is clear regarding academic dishonesty. Any student, who cheats on an academic exercise, lends assistance to others, or who hands in, as a completed assignment, work that is not his or her own will be penalized. The ultimate penalty is suspension from the University. The term "academic exercise" includes all forms of work submitted for points, grades, or credit.

### Academic Honesty Policy:

[http://www.hpu.edu/CourseSchedules/docs/FinalExams/Spring\\_2013\\_INTEGRITY\\_POLICY.pdf](http://www.hpu.edu/CourseSchedules/docs/FinalExams/Spring_2013_INTEGRITY_POLICY.pdf)

## TECHNICAL SUPPORT AND TUTORING OPTIONS

### **HPU's Online Help:**

HPU Client Services at (808) 566-2411 or email: [helpdesk@hpu.edu](mailto:helpdesk@hpu.edu) for technical assistance.

### **Campus Tutoring ([tutoring@hpu.edu](mailto:tutoring@hpu.edu)):**

**The Downtown CAS** is located at 1060 Bishop Street (LB building), Floor 6. Tutoring is available in writing, modern languages, and math, accounting, business, science (MABS).

- This location operates on a walk-in, first-come first-served basis.
- Appointments are *only* taken for HPU students that work full-time, are active-duty military, have ADA status, or who want to see a Writing Mentor.

**The Hawai'i Loa CAS** is located in the Academic Center, 3rd Floor, Educational Technology Center (ETC). Tutoring is offered in select subjects.

- Operates by **appointment only**. Students can make appointments up to two weeks in advance, **ONLY one (1) appointment per subject per day**. For more information and for further assistance, please contact the Tutoring Center (Downtown) at (808) 544-9334.
- NEW!! Book HLC appointments online at: <http://www.genbook.com/bookings/slot/reservation/30196648>

### **Contact Information**

Email: [tutoring@hpu.edu](mailto:tutoring@hpu.edu)

Phone: (808) 544-9334

**Summary Lab Report** (Summary of what you learned. Attempt to limit it to 1 page not including attachments.)

date  
your name  
lab partner's names

**Title/Purpose:** what is the general purpose of the lab? (1 – 2 sentences) What question are you trying to answer?

**Sketch:** the lab set-up. Label all of the equipment.

**Results:** describe your results and relevant findings here. Display all tabulated data, relevant graph information (slope, intercept, etc.), final numbers referenced in the discussion and conclusion, and all relevant uncertainties associated with the results.

**Discussion and Conclusion:** What does this mean? How did the results match up to your expectations? What conclusions can you draw? What are the limitations of your data? (Based on the data we collected, we can approximate the gravitational constant  $g = (9.4 \pm 0.5) \text{ m/s}^2$ , where  $9.8 \text{ m/s}^2$  is within... Contributions to the error include... This experiment was limited by...).

**Note Regarding Attachments:** Graphs should be at least 1/2 page in size and attached as a separate page or printed on the back side of the paper. Other work you find necessary to reference in your results or discussion/conclusion should be added as attachments such as computer code or force table worksheet diagrams.

## Lab Journal

**\*\* Data:** All original data should be recorded in your journal. If you use scraps of paper, information can be lost. In the analysis you will be able to clean this up. Don't be afraid to write things down... If something turns out to be wrong, simply cross it out but don't erase it, you might decide you like it later on! Make sure all of your data has units and labels

For example:

Height [cm]	Distance travelled [cm]
10	12
20	20
30	30
40	55
50	70
60	82
70	150
80	275
90	400

What is the "error" or uncertainty in your measurements? Note the possible environmental conditions that might affect your results. Did you have to stop in the middle for a fire drill? What is the measurement limitation of your ruler? Are there other possible effects?