



Modern Physics Lab

PHYS 2055

Spring 2018

January 14th – May 3rd

Thursday

5:10pm – 8:10pm

LAB – LB 400

NO FINAL – unless you want one...

Welcome to PHYS 2055 – Modern Physics Lab!

We will be using standard lab practices

- Experimental goals will be presented at the BEGINNING of lab
- You will be given two class periods to meet these goals and record your observations
- A written lab report will be due at the BEGINNING of the next experiment's first lab period.

**The lecture (PHYS 2054) is a separate course

INSTRUCTOR INFORMATION

Instructor: Nathan J. Dawson

Email: ndawson@hpu.edu

Office: LB 400

Office Phone: 236-7909

Office hours: MW 2:40pm - 4:40pm

COURSE INFORMATION AND REQUIREMENTS

Course meeting times and location: Unless otherwise specified, all laboratories will meet in **LB 400 (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 2054. A physics lab is where the behavior of real physical phenomena is studied by proscribing and conducting properly constructed experiments. Experiments in modern physics will be conducted and recorded in your experimental journal. The scientific method will be discussed in instructor and student discourse.

Prerequisite: Completion of or concurrent enrollment in PHYS 2054.

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.
- Describe the physics of modern experiments.
- Communicate scientific observations.
- Demonstrate competency with scientific set up and mathematical relationships.
- Learn to evaluate the quality of science being performed by a third party.

ASSESSMENT, GRADING SCHEME, and COURSE SCHEDULE

There are 4 experiments, all related to carrying out experiments 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. Don't worry about making mistakes in here. This is where you want to record your raw data, *i.e.*, "what happened." Your written report will be the one with the final clean analysis.

Written reports are to be completed and turned in one week after the completion of each laboratory. The report will be typeset in LaTeX and will be formatted as an academic paper.

| | |
|-------------------------------------|-----|
| Physics paper review summary | 10% |
| Labs (6 reports – 15% each) | 90% |

| | |
|-----------|-----------|
| A | 92 – 100% |
| A– | 90 – 91% |
| B+ | 87 – 89% |
| B | 82 – 86% |
| B– | 80 – 81% |
| C+ | 77 – 79% |
| C | 72 – 76% |
| C– | 70 – 71% |
| D | 60 – 69% |
| F | 0 – 59% |

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

| Date | Topic | Activities & Assignments |
|-------|--|---|
| 01/17 | Overview of expectations, laboratory notebook, and report format | Syllabus, discussion about expectations, physics paper assignment , overview of LaTeX typesetting. |
| 01/24 | 1 st experiment | Measuring the time-of-flight of photons (Loa) |
| 01/31 | 1 st experiment | Measuring the time-of-flight of photons (Loa) |
| 02/07 | 2 nd experiment | Millikan oil drop |
| 02/14 | 2 nd experiment | Millikan oil drop |
| 02/21 | 3 rd experiment | Capacitance profiling of a semiconductor |
| 02/28 | 3 rd experiment | Capacitance profiling of a semiconductor |
| 03/14 | 4 th experiment | Chasing Chaos with RL-diode circuit |
| 03/21 | 4 th experiment | Chasing Chaos with RL-diode circuit |
| 03/28 | 5 th experiment | Tracking Brownian motion in microscopes |
| 04/04 | 5 th experiment | Tracking Brownian motion in microscopes |
| 04/11 | 6 th experiment (AC 311D) | Fluorescence, feedback, and random lasers (Loa) |
| 04/18 | 6 th experiment (AC 311D) | Fluorescence, feedback, and random lasers (Loa) |
| 04/25 | Hand in final lab report | Turn in lab notebook |

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. 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 15 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

TECHNICAL SUPPORT AND TUTORING OPTIONS

HPU's Online Help:

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

Campus Tutoring (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