

**61121 Physics 170L**

1 Credit

F; 4:00 to 6:45 pm

**INSTRUCTOR:** Dr. Jacob Hudson  
**OFFICE:** Hale Imiloa Rm. 112  
**OFFICE HOURS:** M, T, W, Th; 4:30 pm to 5:30 pm  
**TELEPHONE:** X9112  
**EFFECTIVE DATE:** January 12 to May 6, 2016

**WINDWARD COMMUNITY COLLEGE MISSION STATEMENT**

*Windward Community College is committed to excellence in the liberal arts and career development; we support and challenge individuals to develop skills, fulfill their potential, enrich their lives, and become contributing, culturally aware members of our community.*

**CATALOG DESCRIPTION**

This laboratory course is a rigorous, calculus-based study for professional or engineering majors. Laboratory exercises are designed to reinforce the fundamental concepts of kinematics, mechanics, energy, waves and thermodynamics.

**STUDENT LEARNING OUTCOMES**

The student learning outcomes for the course are:

1. Demonstrate an experimental understanding of some basic physical concepts and theories.
2. Demonstrate familiarity with various instruments and their use in making reliable and precise measurements.
3. Calculate a result with the appropriate number of significant figures.
4. Analyze data using calculation and graphical methods.
5. Organize an accurate and complete laboratory notebook.

## COURSE PHILOSOPHY

Physics is an interesting and challenging subject. It is also the basic science, the foundation of all other physical sciences. Physics attempts to describe the fundamental nature of the Universe and how it works, striving for the simplest explanations common to its diverse behavior. In a rapidly changing environment the key to success is adaptability. There is no other field of study available which offers the student greater flexibility in this high tech society of ours. Whatever the career being pursued by the student, one can get no better grounding in fundamental, logical and critical thinking than is possible in physics.

It cannot be emphasized as to how important the laboratory experience is to the student. In many cases, the validity of a calculated result is based on the assumptions the student made during problem solving. By meeting nature, as it is rather than some idealized form, students can test the validity of these assumptions and come to a better understanding of the central concepts of physics. It has often been said that the labs are the defining experience upon which all of scientific knowledge is based. At the very least, lab experiments emphasize the critical thinking that is needed to succeed in physics.

## ASSESSMENT TASKS AND GRADING

**Grading:** Student assessment will be determined from class participation (~25%), Lab reports (~45%), and the lab notebook (~30%).

**Class Participation** – A laboratory course requires hands-on experiences. Attendance at all classes, on time, and at the scheduled time is necessary. Students are expected to arrive before assignments and instructions are given. The student, before coming to class, should read the experimental procedure that will be preformed, as well as being an active participant in the data taking and analysis.

**Notebook** - Students will be keeping a notebook of all the experimental work they will be doing. The notebook is expected to be well organized, in the students own words, showing all thoughts and measurements that were pertinent to the experiment, a statement of the problem for each experiment, what the general concept was that was being tested, a description of the procedure followed, as well as having a summary of the results, with suitable error analysis and conclusions.

**Lab Reports** – Three lab reports will be turned in during the semester. The lab report is due at the beginning of the lab session following the session in which the experiment was performed.

## LEARNING RESOURCES

Students will need a spiral bound notebook (quadrille is highly recommended), a straight edged protractor, and a 'non-QWERTY' type calculator. A graphing calculator (such as a TI-85) is highly recommended.

## Additional Information (tentative schedule)

Date		Experiment
1/15		Introduction/Graphical Methods
1/22		Vectors
1/29		Statistical Evaluation of Errors
2/5	*	Exam Review (no lab)
2/12		Practicum: Statistical Analysis
2/19		Determination of g: Pendulum
2/26		Determination of g; Air Track
3/4		Energy Transfer in Collisions
3/11	*	Exam Review (no lab)
3/18		Kinetic and Potential Energy
4/1		Hooke's Law and Elasticity
4/8		Natural Oscillations
4/15	*	Exam Review (no lab)
4/22		Specific Heats
4/29		Latent Heats

## DISABILITIES ACCOMMODATION STATEMENT

*If you have a physical, sensory, health, cognitive, or mental health disability that could limit your ability to fully participate in this class, you are encouraged to contact the Disability Specialist Counselor to discuss reasonable accommodations that will help you succeed in this class. Ann Lemke can be reached at 235-7448, [lemke@hawaii.edu](mailto:lemke@hawaii.edu), or you may stop by Hale 'Akoakoa 213 for more information.*