Phys 170L, General Physics I Lab
1 Credit (CRN 60068)
Friday 2:30 to 5:15 pm

INSTRUCTOR: Dr Jacob V Hudson Jr
OFFICE: Hale Imiloa 130 or 122 (NASA AEL Flight Lab)
OFFICE HOURS (times students may drop in for help): M-F 12:00 to 2:00 pm
TELEPHONE: X9112 EMAIL: jacobh@hawaii.edu
EFFECTIVE DATE: Spring 2019; 1/7 - 5/10

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

Windward Community College offers innovative programs in the arts and sciences and opportunities to gain knowledge and understanding of Hawai‘i and its unique heritage. With a special commitment to support the access and educational needs of Native Hawaiians, we provide the Koʻolau region of O‘ahu and beyond with liberal arts, career and lifelong learning in a supportive and challenging environment — inspiring students to excellence.

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.

PRE-REQUISITE

Registration in, or concurrent registration in Physics 170 or consent of the instructor

STUDENT LEARNING OUTCOMES

As a result of taking this course, students can expect to attain the following outcomes:

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.
CONNECTION WITH GLOs

• Develop the ability to perceive how people interact with their cultural and natural environments, through their own worldview and through the worldview of others, in order to analyze how individuals and groups function in local and global contexts.
• Identify information needed in a variety of situations, and access, evaluate, and use relevant information effectively and responsibly.
• Make judgements, solve problems, and reach decisions using analytical, critical, and creative thinking skills.
• Use written, visual, and oral communication to discover, develop, and communicate meaning, and to respond respectfully to the ideas of others in multiple environments.

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 then 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 then 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.

Notebook - Students will be keeping a notebook of all the experimental work they will be doing. The notebook is not expected to be neat, but it should be organized; include a table of contents with page numbering. The notebook should not be “loose leaf” - the pages should be permanently attached. 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.

Windward Community College is an equal opportunity, affirmative action institution.
**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.

**COURSE CONTENT**

Tentative Schedule:

<table>
<thead>
<tr>
<th>Date</th>
<th>Experiment</th>
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<tbody>
<tr>
<td>1/11</td>
<td>Introduction/Graphical Methods</td>
</tr>
<tr>
<td>1/18</td>
<td>Vectors</td>
</tr>
<tr>
<td>1/25</td>
<td>Statistical Evaluation of Errors (lecture)</td>
</tr>
<tr>
<td>2/1</td>
<td>Exam Review (no lab)</td>
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<tr>
<td>2/8</td>
<td>Practicum: Statistics</td>
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<tr>
<td>2/15</td>
<td>Determination of g: Pendulum</td>
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<tr>
<td>2/22</td>
<td>Determination of g: Air Track</td>
</tr>
<tr>
<td>3/1</td>
<td>Exam Review (no lab)</td>
</tr>
<tr>
<td>3/8</td>
<td>Energy Transfer in Collisions</td>
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<tr>
<td>3/15</td>
<td>Kinetic and Potential Energy</td>
</tr>
<tr>
<td>4/5</td>
<td>Exam Review (no lab)</td>
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<tr>
<td>4/12</td>
<td>Rotational Motion</td>
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<tr>
<td>4/19</td>
<td>Natural Oscillations</td>
</tr>
<tr>
<td>4/26</td>
<td>Specific Heats</td>
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**ADDITIONAL INFORMATION**

- MySuccess: Students may be referred for extra help or advising through MySuccess. Students can also explore resources at MySuccess.Hawaii.edu and windward.hawaii.edu/MySuccess

**DISABILITIES ACCOMMODATIONS**

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, or you may stop by Hale ‘Ākoakoa 213 for more information.

*Windward Community College is an equal opportunity, affirmative action institution.*
**TITLE IX**

Title IX prohibits discrimination on the basis of sex in education programs and activities that receive federal financial assistance. Specifically, Title IX prohibits sex discrimination; sexual harassment and gender-based harassment, including harassment based on actual or perceived sex, gender, sexual orientation, gender identity, or gender expression; sexual assault; sexual exploitation; domestic violence; dating violence; and stalking. For more information regarding your rights under Title IX, please visit: [https://windward.hawaii.edu/Title_IX/](https://windward.hawaii.edu/Title_IX/).

Windward Community College is committed to the pursuit of equal education. If you or someone you know has experienced sex discrimination or gender-based violence, Windward CC has resources to support you. To speak with someone confidentially, contact Karla Silva-Park, Mental Health Counselor, at 808-235- 7468 or karlas@hawaii.edu or Kaahu Alo, Designated Confidential Advocate for Students, at 808-235- 7354 or kaahualo@hawaii.edu. To make a formal report, contact the Title IX Coordinator at 808-235-7393 or wcctix@hawaii.edu.

**ACADEMIC INTEGRITY**

Work submitted by a student must be the student’s own work. The work of others should be explicitly marked, such as through use of quotes or summarizing with reference to the original author.

Students can upload papers to [http://www.TurnItIn.com](http://www.TurnItIn.com) to have papers checked for authenticity, highlighting where the paper potentially fails to appropriately reference sources.

In this class, students who commit academic dishonesty, cheating or plagiarism will have the following consequence(s):

Students will receive a failing grade for plagiarized assignments.

All cases of academic dishonesty are referred to the Vice Chancellor for Student Affairs.

**ALTERNATE CONTACT INFORMATION**

If you are unable to contact the instructor, have questions that your instructor cannot answer, or for any other issues, please contact the Academic Affairs Office:

Location: Alakai 121  
Phone: 808-235-7422  
Email: wccaa@hawaii.edu