University of Hawaii Community Colleges
Proposal to Initiate, Modify or Delete a Course

1. Type of Action
   - □ A. Addition □ B. Deletion
   - □ C. Modification: □ in credits □ in title
   - □ in prerequisites or co-requisites □ in number or alpha
   - □ Other (click to specify)

2. New Alpha, Number and Title
   Physics 170L

3. Credits
   1 credit

4. Old Alpha, Number and Title

5. Credits *

6. New 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.

7. Select box and type specific information in text box.
   □ Prerequisites □ Corequisites or Recommended Preparation
   Physics 170

8. Student Contact Hours Per Week
   Lecture
   Lecture/Lab Lab 3
   Other (click to specify)

9. Proposed Date of First Offering
   Semester - Fall
   Year 2007

10. This course □ is proposed for the Liberal Arts Program. □ Other, specify
    ■ can fulfill Nat Sci: Physical If

11. This course Makes No Difference in the number of credits required for the program/core.

12. Equivalent or similar courses offered in the UH System:

<table>
<thead>
<tr>
<th>Campus</th>
<th>Alpha, Number, Title</th>
<th>Campus</th>
<th>Alpha, Number, Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>UH Hilo</td>
<td>Physics 170L</td>
<td>KapiolaniCC</td>
<td>Physics 170L</td>
</tr>
<tr>
<td>UH Manoa</td>
<td>Physics 170L</td>
<td>KauaiCC</td>
<td>Physics 170L</td>
</tr>
<tr>
<td>West Oahu</td>
<td>None</td>
<td>LeewardCC</td>
<td>Physics 170L</td>
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<tr>
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<td>MauiCC</td>
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</tr>
<tr>
<td>HonoluluCC</td>
<td>Physics 170L</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

13. This course is (check one and click in appropriate textbox and provide details):
   □ Already articulated with Physics 170L. General Physics I Laboratory
   Provide details of existing or desired articulation (date, college(s), purposes, pre-major, etc.) in this space:
   ■ Appropriate for Articulation with Physics 170L. General Physics I Laboratory
   Provide details of existing or desired articulation (date, college(s), purposes, pre-major or major, etc.) in this space:
   □ Not yet appropriate for Articulation.

14. Reason for Initiating, Modifying or Deleting Courses or Other Pertinent Comment:
   To provide a physics laboratory for physics 170.

Requested by: [Signature]
Department Chairperson
4/16/04

Approved by: [Signature]
Curriculum Committee Chairperson
10/12/04

[Signature]
Faculty Senate Chairperson
11/09/04

[Signature]
Dean of Instruction
11/10/04

Provost

CCCM #6100 (Amended for WCC use October 2002)
Levels of Review of Course Proposal at Windward Community College

Course Alpha, Number, and Title: Physics 170L General Physics I Laboratory

<table>
<thead>
<tr>
<th>Signatures</th>
<th>Dates</th>
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<tr>
<td>Joseph E. Cotti</td>
<td>12-4-03</td>
</tr>
<tr>
<td></td>
<td>12/4/03</td>
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<tr>
<td></td>
<td>1/4/03</td>
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</table>

2. Department

<table>
<thead>
<tr>
<th>Signature</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>David P. Rempelet</td>
<td>12/15/03</td>
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</tbody>
</table>

Was this course discussed in a department meeting? ☑ Yes ☐ No | 12/14/03 |

3. Division

<table>
<thead>
<tr>
<th>Signature</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Mike O. Allred</td>
<td>5/4/03</td>
</tr>
</tbody>
</table>

4. Curriculum Committee Review

| | |
| Approved | ☑ |
| Disapproved | ☐ |

Reason:

<table>
<thead>
<tr>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jean Shubriga</td>
<td>10/12/04</td>
</tr>
</tbody>
</table>
University of Hawaii Community Colleges
Proposal to Initiate, Modify or Delete a Course
New Course Proposal Form – Go to next page for Course Modification)

**WCC Form for New Course Proposals**
(This sheet was originally pink.)

1. How is this course related to the education needs and goals of the College/Department/Community as reflected in the EDP/ADP?

   The department is tasked to provide a physical science requirement for the liberal arts students. This lab course will provide reinforcement for students of the General Physics course (Phys 170). These students are seeking more scientifically oriented careers, such as physics, astronomy, or engineering.

2. Provide details of any additional staff, equipment, facilities, library/media material, faculty preparation and other financial support that would be required to implement this course. (Include an estimate of the actual cost of supplies and equipment.) What has been done to provide for these additional costs for the proposed date of offering? Who will teach the course?

   An additional instructor will be required. The equipment and facilities are identical to those used in the current physics 151L course.

3. Is a similar course taught elsewhere in the UH system? Yes If yes, provide details of how this course differs from existing similar courses.

   This course, as proposed, is taught elsewhere in the UH system with no differences.

4. Is this course experimental and/or unique to Windward Community College? No If yes, provide rationale and details of its impact on the College Curriculum

5. Is a similar course taught in the upper division level by a 4-year UH college? No If yes, explain why this course is appropriate at the lower division or how it differs from its upper division counterpart.

6. Please attach a complete course outline. Your course outline should address all the items listed in the Guidelines for Course Outlines.

7. If this course is numbered 100 or above or appropriate for transfer to a 4-year college, complete and attach WCC Form for Transfer Courses (blue). See criteria for transfer courses.
Course Alpha and Number: Physics 170L General Physics I Laboratory

Submitted by: J. Hudson/J. Ciotti

Date: March 3, 2004

1. List the counterpart to this course on any 4-year UH campus. Describe the relationship between the course and related baccalaureate program area.

   This is the first of a rigorous, calculus-based, laboratory course for professional or engineering majors. The study of the concepts of physics including the fundamental principles and theories of mechanics, energy, waves, and thermodynamics, with an emphasis on problem solving. As such, any quantitative science major could make use of this course to fulfill a Natural Science requirement. This course is referred to as Physics 170L General Physics I Laboratory at UH Manoa.

2. Is this course taught or accepted by major accredited colleges or universities? Give one or two examples.

   Yes. Georgetown University

3. Please attach a complete course outline if you have not done so already. Your course outline should address all the items listed in the Guidelines for Course Outlines.
University of Hawaii Community Colleges
Proposal to Initiate, Modify or Delete a Course
Articulation with 4-year UH Campus Form

COURSE ARTICULATION FORM (GENERAL EDUCATION CORE)

ORIGINATING CAMPUS: Windward Community College    DATE SUBMITTED: December 11, 2003

COURSE ALPHA & NUMBER: Physics 170L    SEMESTER CREDITS: 1

COURSE TITLE: General Physics I Laboratory

DATE OF OUTLINE: December 11, 2003    Year *

(** Representative outline, no multiple syllabi, please.)

1. Articulation committee to review this course:

   Standing Committees
   Written Communication [ ]
   Mathematical & Logical Thinking [ ]
   World Civilizations [ ]
   Languages [ ]
   Arts & Humanities [ ]
   Natural Science [√]
   Social Science [ ]

2. The information in this item is required by the reviewing committee so that it has a starting point for reviewing the course. It is the responsibility of the submitting campus to do the necessary research to provide this information.

   In the opinion of the originating campus, this course is equivalent to the following and/or meets the criteria for the indicated core categories. Every core category space, except your own campus, must be filled in (can include ‘none’). An equivalent course, if known, may be helpful to committee members but is not required.

<table>
<thead>
<tr>
<th>Receiving Campus</th>
<th>Equivalent Course (Alpha and Number)</th>
<th>Core Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>UH Hilo</td>
<td>Physics 170L</td>
<td>NS II</td>
</tr>
<tr>
<td>UH Manoa</td>
<td>Physics 170L</td>
<td>DY</td>
</tr>
<tr>
<td>UH West Oahu</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
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<td>Maui CC</td>
<td>Physics 170L</td>
<td>NS II</td>
</tr>
<tr>
<td>Windward CC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. If submitted electronically, I understand that this outline will be posted to a publicly accessible web site to enable open access for reviewing committees and campuses. The outline will be taken off the site upon completion of the review.

   Typed Name or Signature

Note: If possible submit coversheet and course outline electronically as e-mail attachments (preferably in ‘pdf’ format). If submitting in printed form, 20 copies of coversheet and course outline are required for distribution for appropriate review.

Note: UCA Clearinghouse
John Muth, Office of the Chancellor for Community Colleges, is acting as staff to the University Council on Articulation and is responsible for tracking all courses submitted for articulation.
COURSE/CATALOG DESCRIPTION
Physics 170L/ 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.

COURSE NAME
General Physics I Laboratory

COURSE ALPHA
Physics 170L

CREDIT/CONTACT HOURS
1 credit/3 contact hours

PREREQUISITES REQUIRED
Concurrent registration in Math 206, Math 242, or Math 252. Math 216 may be substituted with consent.

CO-REQUISITES
Physics 170

RECOMMENDED PREPARATION AND BASIC SKILLS
This is a general physics laboratory with an emphasis on problem solving and data taking. The student should be able to understand algebra, trigonometry, and analytic geometry, as well to be able to perform basic differentiation and integration.

If the course involves the use of mathematics, indicate the level of quantitative reasoning required.

SPECIFIC COURSE OBJECTIVES
Upon successful completion of PHYS 170L, the student will be able to:
- demonstrate an understanding of basic physical concepts and theories as pertains to kinematics, mechanics, energy, waves, and thermodynamics
- use various instruments and make reliable and precise measurements
- calculate a result with the appropriate number of significant figures
- analyze data through calculation and plotting graphs
- keep an accurate and complete laboratory notebook.

What knowledge and/or skills will successful completion of the course develop in the student?

METHOD OF INSTRUCTION
Each laboratory session begins with a lecture. The physical concept to be reinforced by the particular experiment is discussed. The methods for obtaining necessary data, desired results and outcomes, as well as instrument usage are covered. After the lecture, the students will have the remainder of the class session to perform the experiment, obtain the data, and derive the results.

COURSE CONTENT AND APPROXIMATE TIME TO BE SPENT ON EACH TOPIC

One laboratory session for each of the following topics:
Introduction: Experimental Analysis
Statics and Equilibrium
Discussion: Error Analysis
Darts and Errors
Pendulum
Air Track
Energy Transfer in Collisions
Kinetic and Potential Energy
Rotational Motion
Natural Oscillations
Driven Oscillations
Liquid Drag
The Spring of Air (Speed of Sound)

A proposed semester schedule is acceptable.

TEXT(S)
General Physics Laboratory I: Mechanics
Physics 151L and 170L
F. A. Harris; Kendall/Hunt Publishing Co.

REFERENCE AND SUPPLEMENTARY MATERIALS
A scientific calculator, a protractor, and a quadrille notebook (which is to act as a laboratory notebook).

COURSE REQUIREMENTS
Attendance and participation are required for all laboratory sessions. Students must come to class prepared to conduct the exercises described in the reading. Periodically, quizzes will be given at the beginning of lab sessions to verify student preparation.

EVALUATION
The final grade will be determined by a cumulative point total at the end of the semester based on the following:

Laboratory Notebook  50% - This is one of the most important tools used by the experimentalist. All original data, any preliminary calculations and answers to lab questions, as well as any other pertinent observations are to be in this book. The lab notebooks will be collected periodically throughout the semester.

Pre-Lab Quizzes  10%

Post Lab Questions  40% - These take the part of industrial progress reports, and indicate the students understanding of the nature of the experiment that was performed. These are collected sometime during the lab session following the session that data was obtained to answer the questions.

The following scale will be used to determine the final grade;

A  90 - 100%
B  80 - 90%
C  65 - 80%
D  55 - 65%
F  < 55%

Identify methods of evaluation which will be employed to determine if the course objectives are being met (e.g., written examinations, attendance, projects). Specify the grading procedure to be used in the course.
Physics 170L
General Physics Lab I

Instructor:
Lab Time:
Office:
Office hours:
Telephone:
e-mail:

Text: General Physics Laboratory I: Mechanics
Physics 151L and 170L
F. A. Harris; Kendall/Hunt Publishing Co.

Materials: A simple calculator (non QWERTY type), a protractor, and a quadrille notebook (which will be your laboratory notebook) are required. Obviously, you will also need something to write with.

Course Description: This laboratory course is a rigorous, calculus based study of kinematics, mechanics, and thermodynamics with an emphasis on data taking and analysis.

Course Goals: Upon successful completion of this course, the student will be able to:
- demonstrate an experimental understanding of some basic physical concepts and theories.
- demonstrate familiarity with various instruments and their use in making reliable and precise measurements.
- calculate a result with the appropriate number of significant figures.
- analyze data using calculation and graphical methods.
- keep an accurate and complete laboratory notebook.

Course Rules: Attendance and participation are required in all laboratory sessions. Students must come to class prepared to conduct the exercises described in the reading assignment. Periodically, quizzes will be given at the beginning of some labs to verify lab preparation. If missed, these quizzes cannot be made up. In the event that the student faces a medical emergency preventing them from completing one of the scheduled laboratory exercises, then an appointment for a make-up assignment must be scheduled with the instructor within 24 hours of the missed exercise. Documentation of the medical emergency must be presented before commencement of the make-up exercise.

Grading: The final grade will be determined by a cumulative point total at the end of the semester based on the following:
Laboratory Notebook 50% - This is one of the most important tools used by the experimentalist. All original data, any preliminary calculations and answers to lab questions, as well as any other pertinent observations are to be in this book. By its very nature, the notebook is not expected to be neat, but it is expected to be organized. The lab notebooks will be collected throughout the semester.

Pre-lab Quizzes 10% - As has been already stated, these are to test pre-lab preparedness.

Post lab Questions 40% - These take the part of industrial progress reports, and indicate the students understanding of the nature of the experiment that has been performed. These are collected sometime during the next lab session.

The following scale will be used to determine the final grades;

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90 - 100%</td>
</tr>
<tr>
<td>B</td>
<td>80 - 89%</td>
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<tr>
<td>C</td>
<td>65 - 79%</td>
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<tr>
<td>D</td>
<td>55 - 64%</td>
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<tr>
<td>F</td>
<td>&lt; 50%</td>
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</tbody>
</table>

**Lab Schedule: (Tentative)**

<table>
<thead>
<tr>
<th>Lab No.</th>
<th>Date</th>
<th>Laboratory Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Introduction: Experimental Analysis</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Statics and Equilibrium</td>
</tr>
<tr>
<td>3</td>
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<td>Discussion: Error Analysis</td>
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<td>Darts and Errors</td>
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<tr>
<td>5</td>
<td></td>
<td>Pendulum</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Air Track</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Energy Transfer in Collisions</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Kinetic and Potential Energy</td>
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<tr>
<td>9</td>
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<td>Rotational Motion</td>
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<tr>
<td>13</td>
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<td>The Spring of Air</td>
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