UNIVERSITY OF HAWAII COMMUNITY COLLEGES
PROPOSAL TO INITIATE, MODIFY OR DELETE A COURSE

EXHIBIT II

CCCM #6100
(July 26, 1979)

TYPE OF ACTION (circle appropriate)
A. Addition
   1. Regular
   2. Experimental
   3. Other (specify)

C. Modification
   1. in credits
   2. in title
   3. in number or alpha
   4. in prerequisites
   5. Other (specify)

2. NEW ALPHA, NUMBER AND TITLE
PHYS 152, COLLEGE PHYSICS II

3. CREDITS
   03

4. OLD ALPHA, NUMBER AND TITLE
N/A

5. CREDITS
   N/A

6. NEW DESCRIPTION
   A non-calculus, one-semester course for preprofessional or non-engineering majors.
   Study of the basic concepts of physics, including the fundamental principles and theories
   in electricity, magnetism, optics, and modern physics.

7. PREREQUISITES OR RECOMMENDED PREPARATION
   PHYS 151, or equivalent, or consent of instructor.
   CO-REQUISITE: PHY 152L

8. STUDENT CONTACT HOURS PER WEEK
   3 Lecture
   2 Lab
   Other (specify)

9. PROPOSED DATE OF FIRST OFFERING
   Spring 1986

10. THIS COURSE IS (REQUISITE) (ELECTIVE) FOR THE Arts and Science PROGRAM

11. THIS COURSE (XREF) (XREF) (MAY MAKE NO CHANGE) IN THE NUMBER OF CREDITS REQUIRED
    FOR THE PROGRAM.

12. SIMILAR COURSES OFFERED ELSEWHERE
    College(s): UHM, HCC
    Alpha, Number, Title:
    PHYS 151-152 -- College Physics
    PHYS 151-152 -- College Physics

13. THIS COURSE IS (XREF) (XREF) (APPROPRIATE FOR ARTICULATION)
    PROVIDE DETAILS OF EXISTING OR DESIRED ARTICULATION (Date, college(s), purposes,
    pre-major or major, etc.): Spring 1985; UH Manoa; For students in the College of Arts
    and Sciences where it meets Natural Science core requirements and is also required
    for some degrees.

14. REASON FOR INITIATING, MODIFYING OR DELETING COURSE OR OTHER PERTINENT COMMENT:
   The course will provide students opportunities to become more knowledgeable in areas
   closely related to high-technology development. This course is being initiated to
   complete a two-semester introductory physics program at WCC, in accordance with the
   college's EDP.

REQUESTED BY
David M. Ishii
Math/Science
Department/Division
Chairperson
10-19-84

APPROVED BY
Jean K. Sakurai
Curriculum Committee
Date
10-24-84

(Other required campus signature)
Dean of Instruction
Provost
Date
11-14-84
11-30-85
WCC CURRICULUM REVIEW FORM I
FORM FOR COURSE PROPOSALS

A. Information Needed for Processing ALL Course Proposals

Course Title: PHYS 152: College Physics II

Transfer: X Non-transfer

Submitted: David W. Shinn Date

1. Course Objectives:
   At the end of the course the student is expected to be able to:
   a. demonstrate an understanding of the following topics and further, demonstrate the ability to analyze logically and mathematically problems in these fields (see class schedule for more specific areas):
      1) the static and dynamic laws and properties of electricity and magnetism
      2) the associated components (such as resistors, capacitors, batteries, etc.) and their practical use in electrical and magnetic device technology
      3) electromagnetic radiation and its properties of reflection, refraction, dispersion, and interference.
      4) optical lens systems and ray diagramming
      5) Einstein's Relativity Theory: Reference Frames and Physical Effects
      6) Wave-Particle Duality of Nature
      7) The Uncertainty Principle
      8) The Development of Atomic and Nuclear Physics and the Periodic Table
   b. apply the developed physics concepts in abstract as well as real-world situations, and;
   c. define quantitatively and qualitatively the common terms used in physics.

2. Provide details of additional staff, equipment facilities, library/media material and equipment, other financial support that would be required to implement the new course or the course modification. (REFER TO ATTACHED SHEETS)

   Has this additional cost been included in the budget for the proposed date of offering? Include in estimate of actual cost of supplies and equipment in addition to cost already budgeted by the discipline.

   a. Staff: This course will be part of the regular work load assignment for the new 1.0 position in Physics and Physical Sciences. Offering this course will not in itself necessitate the assignment of overload or the hiring of a lecturer.
   b. Equipment Facilities: The needs for equipment facilities can be met by the utilization of the existing lecture classroom in the Iolani Bldg.
   c. Library/media, computer, and equipment are already in place at WCC.
   d. Optional computer-assisted student tutorials may be carried out with the aid of existing computers at WCC and pre-programmed diskettes to be requisitioned as educational supplies, budgeted under PHYS 151-15TL and 152-152L
   e. Classroom demonstrations will be performed with low-cost demo models requisitioned as educational supplies as well as with equipment purchased for the companion laboratory courses.
B. Information Needed to Process Course Modification Proposals ONLY

1. What change is proposed in the course? Provide specific information on both the new and the old course.

   N/A

2. Is the submitted change enough to require a change in course identification? If so, explain thoroughly.

   N/A

3. If the course is articulated with any four year program, give details and dates of agreements(s) and explain any impact the proposed change may have on articulation.

   N/A

4. Will this change alter the number of hours required to attain a certificate or degree? If so, provide details and justification.

   N/A
C. Information Needed to Process New Course Proposals

1. Course relation to EDP of the College:

   This course relates to the college's goal of serving the needs of individuals who are seeking to meet baccalaureate program requirements for four-year colleges in Hawaii and in other locales.

2. Program course in (Please give some information concerning the status of the program and the relation of the course to the program):

   In the College of Arts and Sciences at UH Manoa, this course meets a program requirement in a number of science related degree programs and also fulfills core requirements for non-science majors. At WCC, this course will meet the AA degree natural sciences core requirement.

3. Independent work by students:

   Reading textbook, studying lecture notes, completing problem sets, and participating in optional learning activities such as weekly problem sessions and computer assisted instruction.

4. Rationale for articulation with UHM General Education Core--attach Windward Community College Form 3 for transfer course criteria, if appropriate:

   This course is similar to PHYS 152, College Physics that is offered by the physics department at UH Manoa (also, see attached Form 3 for transfer criteria).

5. If similar to an upper division course, explain community college application:

   N/A

6. If course is experimental and unique to Windward Community College, indicate additional rationale and impact on college curriculum, if appropriate:

   N/A

D. Attach Course Outline for New Course Proposals or for Course Modifications that Involve Changes in Content, Syllabus, or Time Schedule. Use the Windward Community College FORM 2: General Course Outline for Proposed Course. A student course outline may be submitted, if it indicates the syllabus, content, and time schedule of the proposed course. The student course outline submitted with this form provides this information.
WCC CURR. FORM 2

GENERAL OUTLINE FOR PROPOSED COURSE

Course PHYS 152: College Physics II
Transfer X Nontransfer New X Modified

1. COURSE DESCRIPTION:
A non-calculus, one semester course for preprofessional or non-engineering majors. Study of the basic concepts of physics, including the fundamental principles and theories in electricity, magnetism, optics and modern physics.

2. HOURS PER WEEK: LEC 3 LAB OTHER TOTAL 3

3. PREREQUISITIES: PHYS 151
COREQUISITIES: PHYS 152L

RECOMMENDED PREPARATION: Knowledge of Analytic Geometry, Algebra, and Trigonometry.

4. SPECIFIC COURSE OBJECTIVES:
See attached student course outline

5. TEXTBOOK AND MATERIALS:
See attached student course outline

6. REFERENCE MATERIAL SAMPLES:
See attached student course outline

7. AUXILIARY MATERIALS:
See attached student course outline
TRANSFER COURSE CRITERIA

Course: PHYS 152: College Physics II

New: X  Modified: ____________

Submitted by: David W. Shinn Date: ____________

1. RATE OF STUDENT PROGRESS:
   Refer to lecture schedule for weekly topics, due dates of assigned readings, and examination dates.

2. BASIC SKILLS NEEDED:
   13th grade reading level; knowledge of Analytic Geometry, Algebra, and Trigonometry

3. AMOUNT OF SKILLS AND INDEPENDENT WORK REQUIRED:
   Must be able to read a college level physics textbook with understanding. Must be able to solve physics problems that require mathematical skills at the pre-calculus level (i.e., MATH 140 or equivalent).

4. REASONING REQUIRED:
   Must be able to interpret physical information which relates to the basic theories and models of physics covered. Furthermore, must strategically apply such information to the qualitative and quantitative descriptions of the solutions to problems.

5. CONCEPTUAL COURSE LEVEL:
   College level physics concepts applied in problem solving situations.

6. BACKGROUND KNOWLEDGE PREREQUISITE:
   PHYS 151
   6.5 CO-REQUISITE: PHYS 152L

7. MASTERY LEVEL EXPECTED:
   Ability to achieve at a satisfactory level on assigned problems and on a series of examinations designed to test the student's utilization of the concepts covered.

8. COUNTERPART IN 4 YEAR CAMPUS:
   PHYS 152: College Physics (UH Manoa)

9. COURSE USE IN MAINLAND ACCREDITED SYSTEMS:
   This is the 2nd semester portion of a standard two semester, non-calculus college physics course taught at many 4-year colleges and universities.
WINDWARD COMMUNITY COLLEGE

OUTLINE OF COURSE OBJECTIVES

COURSE NAME: COLLEGE PHYSICS II
COURSE ALPHA: PHYS 152
CREDIT HOURS: 03
CATALOG DESCRIPTION: A non-calculus, one semester course for pre-professional or non-engineering majors. Study of the basic concepts of physics, including the fundamental principles and theories in electricity, magnetism, optics, and modern physics.

REQUIREMENTS COURSE SATISFIES:

AT WCC: Meets AA degree natural sciences core requirement.
AT UH MANOA: May meet natural sciences requirement.
PREREQUISITES: PHYS 151 or equivalent, or consent of instructor
COREQUISITE: PHYS 152L
RECOMMENDED BASIC SKILLS LEVELS: Knowledge of Analytic Geometry, Algebra, and Trigonometry
READING LEVEL OF TEXT(S): 13th grade

ACTIVITIES REQUIRED AT OTHER THAN REGULARLY SCHEDULED CLASS TIMES: None

INSTRUCTOR: DAVID W. SHINN
OFFICE: Iolani 106
OFFICE HOURS: To be announced at the start of the course.
OFFICE PHONE: 235-7321
EFFECTIVE DATE: January 1986
A. Goals of the Course

1. To provide the student with a general as well as quantitative understanding of the basic concepts of physics dealing with matter, with special reference to the fields of electricity, magnetism, optics, and modern physics.

2. To introduce the student to the logical processes and mathematical methodology used in physics.

3. To enhance the student's understanding and appreciation of the simple as well as complex interrelationships between physics and human activities.

B. Objectives of the Course

At the end of the course the student is expected to be able to:

1. demonstrate an understanding of the following topics and further, demonstrate the ability to analyze logically and mathematically problems in these fields (see class schedule for more specific areas):
   a. the static and dynamic laws and properties of electricity and magnetism
   b. the associated components (such as resistors, capacitors, batteries, etc.) and their practical use in electrical and magnetic device technology
   c. electromagnetic radiation and its properties of reflection, refraction, dispersion, and interference.
   d. optical lense systems and ray diagramming
   e. Einstein's Relativity Theory: Reference Frames and Physical Effects
   f. Wave-Particle Duality of Nature
   g. The Uncertainty Principle
   g. The Development of Atomic and Nuclear Physics and the Periodic Table

2. apply the developed physics concepts in abstract as well as real-world situations, and;

3. define quantitatively and qualitatively the common terms used in physics.

C. Performance Criteria for the Course

1. Problem sets: The student will demonstrate the ability to apply physics concepts covered in the lectures and assigned readings by submitting solutions to assigned problem sets. Once assigned, the due dates will be one week later and no late submissions will be accepted unless instructor's consent is obtained. Although these problem sets are to be primarily an individual effort, a couple of helpful suggestions are offered. Firstly, on an individual basis, the student is encouraged to discuss these problem sets with the instructor and peers. Secondly, in addition to the lectures, problem sessions (optional attendance) will be held when appropriate to discuss the assigned problems as well as other problems that may warrant further clarity. Minimum level of achievement for this criterion is 60%.

2. Mid-Term Examinations: The student will demonstrate an understanding of the concepts of physics by integrating information that is gathered from reading assignments, problem sets, and lectures on three closed book/notes mid-term examinations. These exams will, in general, cover four to five major topics presented throughout the course. They will be problem oriented and partial credit can be awarded for partial solutions. Minimum level of achievement for this criterion is 60%.
3. Final Examination: The student will demonstrate the ability to
accumulate and apply the basic concepts of physics covered throughout
the semester on a 2-hour final examination. This exam will be closed
book/note; however, a one page "cribsheet" will be allowed for each
student during the examination.
Minimum level of achievement for this criterion is 60%.

D. Method of Grading

1. The student must meet the minimum level of achievement of Criteria
1, 2, & 3 in order to receive a passing grade for the course. Failure
to satisfy these minimum levels of achievement will result in a grade
of "F".

2. The assignment of points to the different criteria will be as follows:

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Description</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(Problem Sets)</td>
<td>200</td>
</tr>
<tr>
<td>2</td>
<td>(Mid-term Exams)</td>
<td>300</td>
</tr>
<tr>
<td>3</td>
<td>(Final Exam)</td>
<td>200</td>
</tr>
</tbody>
</table>

3. Letter grades will be assigned as follows:

- **A**: average of 90-100% of total points;
- **B**: average of 80-89% of total points;
- **C**: average of 70-79% of total points;
- **D**: average of 60-69% of total points;
- **F**: average of 0-59% of total points;

- **Cr**: Achievement of Criteria 1, 2, & 3 at C level or higher.
  Written consent of the instructor is required.
- **NC**: No credit given; achievement of Criteria 1, 2, & 3 at
  less than C level under the Cr/NC option.
- **I**: Incomplete. This is a temporary grade given at the
  instructor's option when a student has failed to complete a
  small part of a course because of circumstances beyond his or
  her control. The student is expected to complete the course
  by the last day of instruction of the succeeding semester.
  If this is not done, the I will revert to the contingency grade
  identified by the instructor.
- **W**: Official withdrawal after the third week of a 16-week course
  and prior to the end of the 10th week of a 16-week course.

No re-examinations will be given. Make-up exams and waiver of the
minimum levels of achievement will be given only in unique situations
at the instructor's discretion. In the event of non-attendance, the
student will not receive points for that problem set or examination.
Testing is done on an honor system. Students involved in cheating
systems will be dealt with in accordance with the WCC/UH guidelines
concerned with academic dishonesty.

E. Textbook and Other Instructional Materials

   Alan Van Heuvelen
   - A calculator with trigonometric functions.

2. Optional - Study Guide and Workbook for Physics, by Lois M. Kieffaber.

3. Reference Materials - Other introductory physics texts and handouts
   on reserve in the open lab, library, or provided by the instructor.

F. Mode of Instruction

The lecture/demonstration mode of instruction will be very important in
this course. However, the lectures will be designed to supplement, rather
than substitute for, the material in the text. Whenever possible, self-
paced instructional material will be made available to the student. Weekly
problem solving sessions will be appropriately scheduled as well as, in the
case of specific student needs, other tutorial sessions.
<table>
<thead>
<tr>
<th>WEEK</th>
<th>LECTURE TOPICS</th>
<th>READING ASSIGNMENT</th>
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<tbody>
<tr>
<td>1</td>
<td>Electric Charge, Coulomb's Law, Static Electric Forces, Dielectric Constant,</td>
<td>22 (1-8)</td>
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<td></td>
<td>Electric Dipoles, Electric Fields and Their Lines of Force, Electrical Potential</td>
<td>23 (1-2)</td>
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<td>Energy (PEq)</td>
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<td>2</td>
<td>Work-Energy Calculations, Electrical Potential, Potential Difference and</td>
<td>23 (3-5)</td>
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<td>Electrical Field, Electric Power Sources, Electric Current (I) and Drift</td>
<td>24 (1-4)</td>
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<td>Velocity, Ohm's Law and It's Application</td>
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<td>3</td>
<td>Resistance and Temperature, Electrical Power, Kirchhoff's Loop and Junction</td>
<td>24 (5-6)</td>
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<td>Rules and Their Uses, Equivalent Resistance, Measurement Techniques</td>
<td>25 (1-5)</td>
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<td>4</td>
<td>Capacitors and Capacitance, Dielectrics, Dielectric Breakdown, Energy in A</td>
<td>26 (1-7)</td>
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<td>Charged Capacitor, Capacitors in Series and in Parallel</td>
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<td>5</td>
<td>Magnetic Fields and Forces, Circular Motion in a Magnetic Field, Torque on a</td>
<td>27 (1-8)</td>
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<td>Current Loop, DC Electric Motor, Cause of a Magnetic Field, Magnetic Materials</td>
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<td>6</td>
<td>Electromagnetic Induction, Faraday's Law, Polarity of Induced Voltage, Electric</td>
<td>28 (1-7)</td>
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<td>Generators, Mutual and Self Inductance, Transformers</td>
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<td>7</td>
<td>AC Generator, AC Through Resistors, RMS Voltage and Current, Apparent</td>
<td>29 (1-9)</td>
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<td>Resistance of Coils and Capacitors, Phase Angles, RLC circuits, Power in AC</td>
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<td>Circuits, Resonance in RLC Series Circuits</td>
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<td>8</td>
<td>Reflection, Refraction, and Dispersion of Light</td>
<td>19 (1-7)</td>
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<td>9</td>
<td>Lenses, Image Formation, Thin Lens Equation, Human Eye Diagnostics, Angular</td>
<td>20 (1-8)</td>
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<td>Magnification and Magnifying Glasses, Lens Combinations, Aberrations, Mirrors</td>
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<td>10</td>
<td>Huygen's Principle, Double-Slit Experiment, Gratings, Thin Film Interference,</td>
<td>21 (1-6)</td>
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<td></td>
<td>Single-Slit Diffraction, Holography</td>
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<td>11</td>
<td>Reference Frames, Special Relativity, Time Dilation, Length Contraction,</td>
<td>30 (1-7)</td>
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<tr>
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<td>Relativistic Mass and Energy</td>
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<td>12</td>
<td>Electromagnetic Waves and Spectrum, Photon and Some Special Experiments, Wave</td>
<td>31 (1-7)</td>
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<td></td>
<td>Particle Nature of EM Radiation, Wave-Particle Nature of Matter, The</td>
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<td>Uncertainty Principle</td>
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<td>13</td>
<td>Nuclear Model of Atom, Atomic Spectra, Bohr Model, DeBroglie's Quantum</td>
<td>32 (1-4)</td>
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<tr>
<td></td>
<td>Condition, Quantum Mechanics and It's Results for Atomic Wave Functions</td>
<td>33 (1-2)</td>
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<tr>
<td>14</td>
<td>Multielectron Atoms, Periodic Table, Absorption and Emission of Radiation,</td>
<td>33 (3-7)</td>
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<td>Stimulated Emission and Lasers, X-Ray Emission</td>
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<td>15</td>
<td>The Nucleus, Nuclear Force, Binding Energy Concept, Nuclear Reactions, Radio-</td>
<td>34 (1-11)</td>
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<td></td>
<td>active Decay, Half-lives and Decay Rates, Radioactive Dating</td>
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<tr>
<td>16</td>
<td>Review and Final Exam</td>
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**NOTE:** Reading Assignments are to be completed prior to discussion in lecture. Bring texts, notebooks, and handouts to each class session.