UNIVERSITY OF HAWAII COMMUNITY COLLEGES

PROPOSAL TO INITIATE, MODIFY OR DELETE A COURSE

1. TYPE OF ACTION
   A. Addition [X] Regular [ ] Experimental [ ] Other ________________________________ (specify)
   B. Deletion [ ] in credits [ ] in title [ ] in number or alpha [ ] in prerequisites [ ] Other __________________ (specify)
   C. Modification [ ] in credits [ ] in title [ ] in number or alpha [ ] in prerequisites [ ] Other __________________ (specify)

2. NEW ALPHA, NUMBER AND TITLE  ASTRO 110L: Intro to Astronomy Laboratory  3. CREDITS  1

4. OLD ALPHA, NUMBER AND TITLE ________________________________  5. CREDITS ______

6. NEW CATALOG DESCRIPTION - Demonstration of astronomical principles through laboratory observations and analysis of astronomical data. Not required for ASTRO 110. WCC:NS2

7. PREREQUISITES
   Credit of concurrent enrollment in ASTRO 110 or consent of instructor.

8. STUDENT CONTACT HOURS PER WEEK
   Lecture ______ Lecture/Lab ______ Lab ______
   Other (specify) ______

9. PROPOSED DATE OF FIRST OFFERING
   Spring 1998

10. THIS COURSE [ ] IS REQUIRED [ ] IS AN ELECTIVE FOR THE WCC PROGRAM/CORE
    [X] CAN FULFILL Natural Science (Please specify) PROGRAM/CORE (Please specify)
       (Circle approp.) REQUIREMENT

11. THIS COURSE [ ] INCREASES [ ] DECREASES [X] MAKES NO CHANGE IN NUMBER OF CREDITS REQUIRED FOR THE PROGRAM/CORE

12. SIMILAR COURSES OFFERED ELSE WHERE:
    College(s):       Alpha. Number. Title:
    UH Hilo          ASTR 110L    GENERAL ASTRONOMY LABORATORY

13. THIS COURSE IS
    [ ] ALREADY ARTICULATED [X] APPROPRIATE FOR ARTICULATION [ ] NOT YET APPROPRIATE FOR ARTICULATION
       with ________ with UH Hilo
       (Provide details of existing or desired articulation (date, college(s), purposes, pre-major or major, etc.)

14. REASON FOR INITIATING, MODIFYING OR DELETING COURSE OR OTHER PERTINENT COMMENT:
    Provide lab techniques in analyzing astronomical data and develop skills in astronomical observations. Fulfills excellence in planetary astronomy as stated in ADP.

REQUESTED BY: ____________________________  12-2-96
(Department Chairperson)

APPROVED BY: ____________________________  1/16/97
(Circle approp.)

CURRICULUM COMMITTEE Date

FACULTY/STUDENT BODY Date

DEAN OF INSTRUCTION Date

PROVOST Date

Change recorded by Catalog Preparer

CCC# 6100
(Amended for WCC use Sept. 1991)
<table>
<thead>
<tr>
<th>Signatures</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Subject Area (one or more instructors in the area)</td>
<td>11-12-96</td>
</tr>
<tr>
<td></td>
<td>11-12-96</td>
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<td></td>
<td>11-12-96</td>
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<td>11-12-96</td>
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</tbody>
</table>

2. Department

Department Chairperson

Was this course discussed in a dept. mng. 11-12-96

3. Division

Assistant Dean of Instruction

12-2-96

4. Curriculum Committee Review

Approved

Disapproved

Reason:

David Denin

Curriculum Committee Chairperson 1/16/97
COURSE ARTICULATION FORM

ORIGINATING CAMPUS: Windward CC
COURSE ALPHABET & NUMBER: ASTRO 110L
COURSE TITLE: Introduction to Astronomy Laboratory
DATE SUBMITTED: 11/4/96
SEMESTER CREDITS: 1
DATE OF OUTLINE: (Fall or Spring) Spring Year 1997

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

1. Articulation committee to review this course:

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

   B. Special Discipline/Program Committee [ ]

      Specify discipline/program

      Campus with which this course should be articulated (special articulation only):

      UH Manoa [ ]
      UH Hilo [X]
      Community Colleges [ ]
      UH West Oahu [ ]

2. In the opinion of the originating campus, this course is equivalent to the following and/or meets the criteria for the indicated core categories:

<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>ASTR 110L</td>
<td>11.C.PHYS</td>
</tr>
<tr>
<td>UH Manoa</td>
<td>Unknown</td>
<td>NS2</td>
</tr>
<tr>
<td>UH West Oahu</td>
<td>Unknown</td>
<td>NS2</td>
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<tr>
<td>Hawaii CC</td>
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<td>NS2</td>
</tr>
<tr>
<td>Windward CC</td>
<td>Unknown</td>
<td>NS2</td>
</tr>
</tbody>
</table>

3. Notes

Revised 1/29/93
WOC FORM FOR TRANSFER COURSES

(To be completed for articulation with any 4-year UH campus)

Course ASTRO 110L Submitted by JOSEPH CIOTTI Date 4-4-96

1. List the counterpart to this course on any 4-year UH campus. Describe the relationship between the course and any related baccalaureate program area.
   UH Hilo: ASTR 110L
   This course is accepted at UH Hilo towards minor in Earth and Space Science

2. Is this course taught or accepted by major accredited colleges or universities? Give one or two examples.
   UH Hilo: ASTR 110L

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.
WCC FORM FOR NEW COURSE PROPOSALS

Course ASTRO 110L Submitted by JOSEPH CIOTTI Date 11-4-96

1. How is this course related to the educational needs and goals of the College/Department/Community as reflected in the EDP?
   This laboratory course in astronomy addresses Windward's identified area of excellence in Planetary Astronomy as listed in its ADP.

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?
   Present Astronomy instructor will offer this course during spring semester. Until a new Physical Science instructor is hired, one of the 2 ASTRO 110 normally offered in spring will be replaced by this course. Most of the equipment will be borrowed from physics inventory. Faculty prep sponsored by Space Grant funds.

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.
   No substantial difference

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 on 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 attached criteria for transfer courses.)
| JAN  | 13  | The seasons & astronomical time systems  
|      |     | Exercise: 5 & 7  
| 20   | **HOLIDAY:**  
|      | **Martin Luther King Day**  
| 27   | Constellation identification & the celestial sphere  
|      | Exercise: 2  
| FEB  | 3   | Observing with a telescope: Locating celestial objects  
|      | Exercise: 8  
| 10   | Celestial mechanics & interplanetary travel  
|      | Exercise: 4  
| 17   | **HOLIDAY:**  
|      | **Presidents' Day**  
| 24   | Principles of space flight: artificial satellites & model rockets  
| MAR  | 3   | Optics in astronomy: refraction & reflection  
|      | Exercise: 9  
| 10   | The Moon: Mountain heights and crater dating  
|      | Exercise: 11  
| 17   | Observing with a telescope: Moon or Sun  
|      | Exercise: 12 or 15  
| 24   | **SPRING BREAK**  
| APR  | 31  | Planetary analysis: remote sensing & digital image processing  
|      | Exercise: 13  
| 7    | Stellar parallax: measurement of astronomical distances  
|      | Exercise: 16  
| 14   | Photometry & magnitude scale  
|      | Exercise: 18  
| 21   | Astronomical spectroscopy & spectral classification  
|      | Exercise: 19 & 20  
| MAY  | 28  | Galactic spiral structure: Cepheid & RR Lyrae variables  
|      | Exercise: 24  
| 5    | Classification of galaxies & galaxy redshifts  
|      | Exercise: 27  

**No FINAL EXAM**
Windward Community College

OUTLINE OF COURSE OBJECTIVES

COURSE NAME: Introduction to Astronomy Laboratory
COURSE NUMBER: ASTRO 110L
COURSE CREDITS: 1 credit

CATALOG DESCRIPTION: Demonstration of astronomical principles through laboratory observations and analysis of astronomical data. Not required for ASTRO 110.

PREREQUISITES: Credit or concurrent enrollment in ASTRO 110 or consent of instructor.

ARTICULATION BY CAMPUS:
WCC: Natural Sciences: Group 2—Physical Sciences (NS2)
UH Hilo: Natural Sciences—Physics (II.C.Phys)

TEXTBOOKS AND OTHER ASSIGNED INSTRUCTIONAL MATERIALS:
- Introductory Astronomy Exercises by Dale C. Ferguson
- Voyager II: Dynamic Sky Simulator (available at Hale 'Imiloa Computer Lab)
- Voyager through Space and Time (projects for Voyager) by Jon K. Wooley
- Supplementary laboratory experiments will be described in handouts distributed throughout the course

REQUIRED MATERIALS: pocket calculator; metric ruler; model rocket kit with engines.

ACTIVITIES REQUIRED AT SCHEDULED TIMES OTHER THAN CLASS TIMES:
- Evening observation session(s) as posted in semester's syllabus
- Internet activity available on campus, if not available at student's home

INSTRUCTOR: Dr. JOSEPH CIOTTI
OFFICE: Iolani 106
OFFICE HOURS: Posted on office door
OFFICE PHONE: 235-7319 (WCC Office) 235-2631 (Aerospace Lab)
EFFECTIVE DATE: Spring 1997
ASTRO 110L: INTRODUCTION TO ASTRONOMY LABORATORY
SUPPLEMENTARY INFORMATION

A. Goal of the Course

The primary goal of this astronomy laboratory course is to provide the student with an in-depth feeling for the scientific method through the basic astronomical investigations. Students will engage in computer simulated experiments, actual telescopic observations, experiments involving laboratory apparatus and analysis of pre-acquired observational data.

B. Objectives of the Course

Upon completion of the course, the student should:

1. have a general understanding for the basic procedures and methods of experimental analysis as applied to a selected group of fundamental topics in astronomy (see lab syllabus);

2. have the ability to comprehensively report all work conducted in a laboratory and/or observatory environment in a manner exhibiting both organization and proper documentation;

3. have an understanding and working knowledge of experimental data and error analyses as well as problem solving;

4. have an understanding of basic astronomical instruments;

5. have a working knowledge of computer on-line and Internet astronomical programs;

6. have an increased awareness of some types of environmental factors which affect the outcome of an experimental approach.

C. Instructional Materials

Laboratory handouts for the various experiments will be distributed to the student prior to the day of each scheduled experiment. This handout must be brought to the laboratory session.

The student is required to use a quadrille notebook for recording all information related to the laboratory experiment. The use of a scientific calculator is strongly recommended.

The instructor will at times provide other instructional handouts necessary for the course.
D. Mode of Instruction

The instructor will give a preliminary discussion of each experiment at the start of each lab period. This overview will usually include demonstrations and explanations pertaining to the use of the apparatus and the objective(s) of the experiment. This discussion is intended to supplement, rather than replace, the student's preparation prior to coming to class.

Students will engage in laboratory activities that include: actual telescopic observations; simulations and exercises presented via on-line computer programs and the Internet; analysis of archival astronomical data; and experiments utilizing various physics apparatus.

E. Method of Evaluation

1. Evaluative Instruments:

Evaluation of the successful completion of the objectives of this course will be determined by grades received on the following evaluative instruments:

**Laboratory Reports**: Lab report are completed according to the instructions given in the lab manual and/or on the handouts distributed at each lab session. Ordinarily, the report consists of a completed data and analysis sheet provided in the handout plus any other appropriate sheet of observed data and graphical analysis. Graphical analysis can be computed using computer software. A brief visit to the Computer Lab in Hale 'Imiloa (Science Building) will act as an introduction to computer graphical analysis.

The student is also expected to maintain an individual notebook detailing each experiment performed, including all data obtained and calculations made.

The laboratory notebook must be bound to prevent loss of collected data and notes. **Notes should be taken in ink.**

**Lab Reports are worth 10 points each. The lowest lab score will be dropped from the student's records.** All graded Lab Reports are to be turned in at the beginning of the next scheduled lab period. **Penalty for a late lab report will be two (2) points per school day the report is late.** Under special circumstances, this penalty may be waived at the discretion of the instructor.
2. **Grading System:**

Each letter grade and its respective level of achievement is provided in the following table:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90% - 100% of cumulative points possible</td>
</tr>
<tr>
<td>B</td>
<td>80% - 89% of cumulative points possible</td>
</tr>
<tr>
<td>C</td>
<td>70% - 79% of cumulative points possible</td>
</tr>
<tr>
<td>D</td>
<td>60% - 69% of cumulative points possible</td>
</tr>
<tr>
<td>F</td>
<td>below 60% of cumulative points possible</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete: This 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 the student's control. All required work must be completed by the last day of instruction of the succeeding semester.</td>
</tr>
</tbody>
</table>

*The Cr/NC option must be declared by the end of the 10th week of classes. Written consent of instructor is required for this option.*

| Cr | Achievement of objectives at the C level or higher. |
| NC | Achievement of objectives at less than C level. (Formal grade) |
| N  | Achievement of objectives at less than C level. (Optional instructor's grade) |
| W  | Official withdrawal after the third week of a 16-week course and prior to the end of the 10th week. If a student officially withdraws by the end of the 3rd week of a 16-week course, the record of registration in this course will not appear on the student's transcript. |
F. Other Information

1. Make-up labs are normally not permitted.

2. The student is responsible for keeping abreast with any changes in syllabus which are announced in class.

3. A student can determine his/her current grade during any time of the semester by dividing his/her cumulative score by the cumulative points possible and converting into a percentage and referring to the table of Letter Grades.

4. Any student wishing to be informed of his/her semester grade in advance of the official mailing of report cards should provide the instructor a stamped, self-addressed postcard or envelope at the end of the semester.