Proposal to Initiate, Modify or Delete a Course

1. **Type of Action**
   - ☒ A. Addition
   - ☐ Regular or ☒ Experimental or ☐ Other (click and type to specify)
   - ☐ B. Deletion

2. **New Alpha, Number and Title**
   - ASTR 250L: Observational Astronomy Lab

3. **Credits**
   - 1 credit

4. **Old Alpha, Number and Title**

5. **Credits**
   - *

6. **New Catalog Description**
   - A lab course in modern observational astronomy, with emphasis on "hands-on" use of instruments to acquire data with research-grade telescopes at the college's LaniiObservatory. Remote telescope observations may also be used. Students will gain on-site observing experience with CCD photometry and spectroscopy through direct acquisition and data analysis using modern laboratory data reduction software. Applications to planetary, solar, stellar and, where possible, galactic astrophysics will be covered.

7. **Select box and type specific information in text box.**
   - ☒ Prerequisites ☐ Corequisites or ☒ Recommended Preparation
   - Prerequisites: credit or current enrollment in ASTR 250;
   - Recommendations: The student should have a good operational familiarity with high school algebra and basic trigonometry

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

9. **Proposed Date of First Offering**
   - Semester Fall
   - Year 2011

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

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>*</td>
<td>ASTR 250L</td>
<td>Hilo</td>
<td>ASTR 250L</td>
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<td>*</td>
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</tbody>
</table>

13. **This course is** (check one and click in appropriate textbox and provide details):
   - ☐ Already articulated with
   - Provide details of existing or desired articulation (date, college(s), purposes, pre-major, etc.) in this space:
   - ☒ Appropriate for Articulation with ASTR 250L
   - 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:**
   - This course completes WCC's astronomy offerings designed to match the first two-year sequence of astronomy courses required for UH-Hilo's BS Astronomy program. This lab complements the newly proposed ASTR 250 lecture course. The recent articulation agreement between WCC and UH-Hilo permits WCC students who have completed this sequence to enter UH-Hilo's BS program in astronomy.

---

Requested by: [Signature] Date 12/11/09

Approved by: [Signature] Date 2/15/10

[Signature] Date 3/2/10

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

<table>
<thead>
<tr>
<th>Course Alpha, Number, and Title: ASTR 250L: Observational Astronomy Lab</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Signatures</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Department Area (more than one departmental instructor's signature required)</td>
<td></td>
</tr>
<tr>
<td>Joseph E. Costi</td>
<td>12-11-09</td>
</tr>
<tr>
<td></td>
<td>12/12/09</td>
</tr>
<tr>
<td></td>
<td>12/11/09</td>
</tr>
<tr>
<td></td>
<td>12/11/09</td>
</tr>
<tr>
<td>2. Department</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12/11/09</td>
</tr>
<tr>
<td></td>
<td>Department Chairperson</td>
</tr>
<tr>
<td></td>
<td>Was this course discussed in a department meeting? □ Yes □ No</td>
</tr>
<tr>
<td>3. Division</td>
<td></td>
</tr>
<tr>
<td>Paul R. Freit</td>
<td>01/14/08</td>
</tr>
<tr>
<td>4. Curriculum Committee Review</td>
<td></td>
</tr>
<tr>
<td>Approved ☑</td>
<td></td>
</tr>
<tr>
<td>Disapproved ☐</td>
<td></td>
</tr>
<tr>
<td>Reason:</td>
<td></td>
</tr>
<tr>
<td>David B. Ginns, Curriculum Committee Chairperson</td>
<td>2/15/10</td>
</tr>
</tbody>
</table>

CCCM #6100 (Amended for WCC use October 2002)
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 Natural Sciences department is tasked to provide a physical science lab requirement for the liberal arts students and offer STEM related courses. This is course simultaneously can be used for transfer students interested in pursuing a BS degree in astronomy at UH-Hilo.

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?

The equipment is identical to that used for PHYS 152 and ASTR 110. In addition, the college's extensive resources offered through its Lanihuli Observatory, Hokulani Imaginarium and Aerospace Exploration Lab and NASA Flight Training Aerospace Education Laboratory will be fully utilized. This course could be taught by existing faculty.

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 at UH-Hilo with the only major difference in the actual observatory visited.

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.
WCC Form for Course Modifications

Course
Submitted by
Date December 11, 2009

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

2. What is the rationale for the change?

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

4. Is the course articulated with any 4-year program? *

   If yes, give details of the agreement(s) and explain any impact the proposed modifications may have on articulation.

5. Provide details of any additional staff, equipment, facilities, library/media material, faculty preparation and other financial considerations that would be required to implement this course modification. What has been done to provide for these additional costs? Who will teach the course? Is additional preparation needed?

6. Will this course modification result in any alterations in the number of hours required to attain a certificate or degree? * If yes, provide details and justification for these alterations.

7. If the course is renumbered to 100 or above, does it meet the criteria for transfer level courses? (Go to next page for transfer course criteria.) *

CCCM #6100 (Amended for WCC use September 2002)
Original dated WCC 9/91
WCC Form for Transfer Courses
(To be completed for articulation with any 4-year UH campus)
(This sheet was originally blue.)

Course Alpha and Number ASTR 250L

Submitted by Joseph Ciotti

Date December 11, 2009

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

   ASTR 250L is taught at UH-Hilo in conjunction with its ASTR 250 offering. This course completes WCC's astronomy offerings designed to match the first two-year sequence of astronomy courses required for UH-Hilo's BS Astronomy program. The recent articulation agreement between WCC and UH-Hilo permits WCC students who have completed this sequence to enter UH-Hilo's BS program in astronomy.

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

   Yes. ASTR 191 (Astrophysical Laboratory) at Harvard 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.

CCCM #6100 (Amended for WCC use September 2002)
Original dated WCC 9/91
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, 2009

COURSE ALPHA & NUMBER: ASTR 250L       SEMESTER CREDITS: 1

COURSE TITLE: Observational Astronomy Lab

DATE OF OUTLINE: December 11, 2009       Year 2009

(** 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>ASTR 250L</td>
<td>DY</td>
</tr>
<tr>
<td>UH Manoa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UH West Oahu</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hawaii CC</td>
<td></td>
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<tr>
<td>Honolulu CC</td>
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<tr>
<td>Kapiolani CC</td>
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<tr>
<td>Kauai CC</td>
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<tr>
<td>Leeward CC</td>
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<tr>
<td>Maui CC</td>
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<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.

[Signature]

Type of 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.

Revised 1/29/2001
University of Hawaii Community Colleges  
Proposal to Initiate, Modify or Delete a Course  
Articulation with 4-year UH Campus Form  

COMMITTEE LEVEL:

1. When the committee has completed its review of a course, the "ARTICULATION RECOMMENDATION FORM" (revised 1/18/2001) should be filled in and attached to the outline. The committee chair should also sign the form.

2. If the committee choice is "accept," indicate receiving campus core area. If the committee choice is "not recommended," a reason must be provided. Outlines with missing or incomplete recommendation forms will be returned to the committee.

If a committee requires updated or more complete outlines, such requests should be made through the UCA Clearinghouse so that the new outline material can be tracked and placed in the file. If a committee requires more general supporting information, this should be requested through the course's supporting campus representative on the committee.

3. All committee recommendations should be sent to the UCA Clearinghouse for recordation and dissemination to the campuses. DO NOT SEND THE RECOMMENDATIONS DIRECTLY TO ANY CAMPUS.

RECEIVING CAMPUS:

1. Courses will be sent to each campus for consideration after they come out of committee. Each campus has its own internal process for the approval of courses for its general education core.

2. In all cases where a campus accepts a course into its general education core, it must also indicate which area or part of its core the course fits.

3. In all cases where a campus does not accept a course for articulation, it must supply a reason (even it is "we agree with the committee").

4. When campus actions are completed, these actions should be conveyed back to the UCA Clearinghouse for recordation and publication.

5. The Community College Policy on Acceptance of UCA Reviewed Courses is as follows:

   (a) All Community Colleges agree to accept positive UCA committee recommendations for core, including core categories assigned by the committee.

   (b) All Community Colleges agree to accept the UCA committee judgment of not-Recommended (nR) without further review.

   (c) This policy is retroactive to the time the current articulation effort started.

   (d) The Community Colleges reserve the right to review and modify core category assignments as necessary to insure appropriate categorization and to realign such assignments if changes are made to the campus core structure. Such modifications shall not interfere with the timely publication of the student transfer handbook.


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.  
Revised 1/29/2001
University of Hawaii Community Colleges
Proposal to Initiate, Modify or Delete a Course
Articulation with 4-year UH Campus Form

ARTICULATED COURSE
CHANGE IN ALPHA/NUMBER/TITLE

Old Course

________________________________________________________________________

Course Alpha & Number:
Title:

________________________________________________________________________

Revised Course

________________________________________________________________________

Course Alpha & Number:
Title:
Semester and Year when the revised course was/will be first offered:
Reason for the change in Alpha/Number/and/or Title:

________________________________________________________________________

Note: A current outline of the course must be submitted with this form. Undated outlines are not acceptable.

I certify that this course has had its alpha, number, and/or title changed, but that it is substantially the same course as the course that was reviewed and approved for articulation.

Campus: Windward Community College
Certifying Authority (Typed Name or Signature and Title)
Date:

SUBMIT TO: UCA Clearinghouse, Attn: John Muth
Chancellor's Office for CC, 2327 Dole Street

Revised 1/19/01
ASTR 250L: Observational Astronomy Lab
1 credit
Section:
Tuesday 5:30 – 8:00 pm

INSTRUCTOR: Joseph Ciotti
OFFICE: ‘Imiloa 134
OFFICE HOURS: posted on office door
TELEPHONE: 236-9111
EMAIL: ciotti@hawaii.edu
EFFECTIVE DATE: Fall 2011

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

A lab course in modern observational astronomy, with emphasis on "hands-on" use of instruments to acquire data with research-grade telescopes at the college’s Lanihuli Observatory. Remote telescope observations may also be used. Students will gain on-site observing experience with CCD photometry and spectroscopy through direct acquisition and data analysis using modern laboratory data reduction software. Applications to planetary, solar, stellar and, where possible, galactic astrophysics will be covered.

Prerequisites: credit or current enrollment in ASTR 250

Recommendations: The student should have a good operational familiarity with high school algebra and basic trigonometry

Required Activities at Times Other Than Class Times: daytime solar observation (one day)

Optional Activities at Times Other Than Class Times: Imaginarium shows

STUDENT LEARNING OUTCOMES

Upon successful completion of this course, the student will be able to:

1. Use appropriate celestial charts and astronomical time system to identify and locate celestial objects, such as stars, nebulae, galaxies, planets, satellites and asteroids.
2. Describe the fundamentals optics and telescopic observations
3. Operate and make observations with optical, radio and cosmic ray telescopes.
3. Apply basic principals in planetary remote sensing and image processing using both real-time observations and archived data.
4. Apply the techniques of astrophotography and spectrometry.
5. Use appropriate techniques to analyze astronomical data.

COURSE OVERVIEW

A. Goals of the Course

The goals of the course are:

1. To provide the student with hands-on experience with observational planetary and stellar astronomy.
2. To provide the student with the general methods and techniques used by astronomers to collect and analyze data in various spectral regions.
3. To cultivate and enhance the student's ability to reason by applying the scientific method.
4. To promote greater student appreciation and awareness of the prominent role of astronomical research in Hawai‘i.

B. Expectations of Students

Success in this course will be enhanced by:

1. a positive, inquiring attitude toward science
2. setting aside adequate time for studying and working problems
3. reading the text carefully and making notes and use of handouts and other learning materials whenever necessary
4. seeking assistance from the instructor
5. class attendance and responsibly obtaining all assignments and/or changes to the course syllabus
6. keeping abreast with or ahead of the syllabus

C. Mode of Instruction

Lecture/Discussion: The initial portion of each lecture period is used to discuss and clarify any questions from the preceding class meeting. The remaining portion is used to present and discuss new materials. Demonstrations and audio-visual materials are included in lectures.

ASSESSMENT TASKS AND GRADING

Method of Evaluation

Evaluation of the successful completion of the objectives of this course will be determined by grades received on all lab reports.

Each of the 13 scored labs is worth 20 points. The lowest two lab grades will be dropped. There is no Final Exam. The average of the 13 highest lab scores will determine the student’s course grade.
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 (excellent achievement)</td>
</tr>
<tr>
<td>B</td>
<td>80% - 89% of cumulative points possible (above average achievement)</td>
</tr>
<tr>
<td>C</td>
<td>70% - 79% of cumulative points possible (average achievement)</td>
</tr>
<tr>
<td>D</td>
<td>60% - 69% of cumulative points possible (minimal passing achievement)</td>
</tr>
<tr>
<td>F</td>
<td>below 60% of cumulative points possible (less than minimal passing achievement)</td>
</tr>
<tr>
<td>I</td>
<td>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 the student's control. The student is expected to complete the course by the designated deadline in the succeeding semester. If this is not done, the “I” will revert to the contingency grade identified by the instructor.</td>
</tr>
</tbody>
</table>

Credit/No Credit Option

*Note: Refer to the current Schedule of Classes for CR/NC declaration deadlines. This grading option is not available in all courses and will not be offered to majors in required courses.*

CR
Achievement of objectives of course at the C level or higher. (course credit awarded)

NC
Used to denote achievement of objectives of the course at less than C level under CR/NC option. (no course credit awarded)

N
The “N” grade, which is issued at the instructor’s option, indicates that the student has worked conscientiously, attended regularly, finished all work, fulfilled course responsibilities, and has made measurable progress. However, either the student has not achieved the minimal student learning objectives and is not yet prepared to succeed at the next level, or the student has made consistent progress in the class but is unable to complete the class due to extenuating circumstances, such as major health, personal or family emergencies, (no course credits awarded)

W
Official withdrawal from the course. See the Schedule of Classes for information regarding current semester deadlines. If a student officially withdraws within the erase period, the record of registration will not appear on the student’s transcript. (no course credits awarded)

L
Audited Course (no course credit awarded)

LEARNING RESOURCES


- scientific calculator
**Additional Information**

1. Lab reports are due at the beginning of the following lab period. Late reports are penalized 10 points. Missed labs may not be made up and are scored zero points.

2. 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, Ann Lemke, to discuss reasonable accommodations that will help you succeed in this class. She can be reached by phone at 235-7448 or via email lemke@hawaii.edu, or you may stop by Hale ʻAkoakoa 213 for more information.

3. Students are encouraged to visit WCC's **Aerospace Exploration Lab** (located in Hale ʻImiloa 135). Besides a large collection of astronomy related resource materials, which the student may borrow for an extra-credit project, there is a hands-on physical science museum. Phone 235-7321. Students are also encouraged to visit the **Imaginarium** (Hale Hoku`ulani) and the **NASA Flight Training Aerospace Education Laboratory** (ʻImiloa 112).

5. A student can determine his/her current grade at any time during 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.

6. Any student wishing to be informed of his/her semester grade in advance of the official report of grades should email a request for the grades to the instructor during Final Exam week. The student may also provide the instructor a stamped, self-addressed postcard or envelope on the last day of the class.
<table>
<thead>
<tr>
<th>Month</th>
<th>Date</th>
<th>Lab Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug</td>
<td>24</td>
<td>Lab 1: Celestial Coordinates</td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>Lab 2: Star Charts &amp; Catalogs</td>
</tr>
<tr>
<td>Sep</td>
<td>7</td>
<td>Lab 3: Geometric Optics</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Lab 4: Basics of optical telescopes</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>Lab 5: Observing with optical telescopes</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>Lab 6: Astrophotography (CCD)</td>
</tr>
<tr>
<td>Oct</td>
<td>5</td>
<td>Lab 7: Photometry (asteroids)</td>
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<td></td>
<td>12</td>
<td>Lab 8: Planetary Astronomy I: Mars Student Imagining Project (MSIP)</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>Lab 8 (cont) Planetary Astronomy II: MSIP</td>
</tr>
<tr>
<td>Nov</td>
<td>2</td>
<td>Election Day</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Lab 10: Spectroscopy</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>Lab 11: Variable star observations</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>Lab 12: Heliostat (solar telescope)</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>Lab 13: Solar astronomy observations</td>
</tr>
<tr>
<td>Dec</td>
<td>7</td>
<td>Enrichment Lab: Radio &amp; Cosmic Ray telescopes</td>
</tr>
</tbody>
</table>

No FINAL EXAM