University of Hawaii Community Colleges
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 [ ]
   - C. Modification: [ ] in credits [ ] in title [ ] in number or alpha
     [ ] in prerequisits or co-requisits [ ] Other (click to specify)

2. New Alpha, Number and Title
   ASTR 250: Observational Astronomy

3. Credits 3 credits

4. Old Alpha, Number and Title

5. Credits *

6. New Catalog Description
   An introduction to the tools and techniques of observational astronomy: astronomical time and coordinate systems, photometric systems and magnitudes, principles of telescopes and their operation, introduction to modern astronomical instruments, analysis of astronomical data. Includes planetary, solar and stellar observations.

7. Select box and type specific information in text box.
   - [ ] Prerequisites [ ] Co-requisites or
   - [ ] Recommended Preparation
   Prerequisites: ASTR 110; or ASTR 180 and ASTR 181; Recommendations: The student should have a good operational familiarity with high school algebra and basic trigonometry

8. Student Contact Hours Per Week
   Lecture 3
   Lab 0
   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>UH Hilo</td>
<td>ASTR 250</td>
<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 250
     Provide details of existing or desired articulation (date, colleges(s), purposes, pre-major or major, etc.) in this space:
     WCC and UH-Hilo already have an articulation agreement in astronomy dated 2 April 2009

   - [ ] 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. 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.

15. Requested by: [Name]
    Date: 12/11/09

16. Approved by: [Name]
    Date: 2/15/10

17. Department Chairperson
    Date: 3/1/10

18. Curriculum Committee Chairperson
    Date: 3/2/10

19. Faculty Senate Chairperson
    Date: 3/2/10

CCCMM #6100 (Amended for WCC use October 2002)
Signature for ASTR 250
University of Hawaii Community Colleges
Proposal to Initiate, Modify or Delete a Course

Provost

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

Levels of Review of Course Proposal at Windward Community College

Course Alpha, Number, and Title: ASTR 250: Observational Astronomy

Signatures

1. Department Area (more than one departmental instructor's signature required)

   Joseph E. Crotti
   
   D. W.
   
   [Signature]

   Dates

   12-11-09
   12/12/09
   12/11/09
   12/11/09

2. Department

   [Signature]

   Department Chairperson

   Was this course discussed in a department meeting? ☐ Yes ☐ No

   12/11/09

3. Division

   [Signature]

   01/14/09

4. Curriculum Committee Review

   Approved ☑

   Disapproved ☐

   Reason:

   [Signature]

   Curriculum Committee Chairperson

   2/15/10

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 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.
University of Hawaii Community Colleges
Proposal to Initiate, Modify or Delete a Course
Course Modification Form – Go to next page for Articulation Form

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 250

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 250 which is taught at UH-Hilo. 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 192 (Tools and Techniques of Astronomical Measurement) 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.
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 250  
SEMESTER CREDITS: 3

COURSE TITLE: Observational Astronomy

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 250</td>
<td>DP</td>
</tr>
<tr>
<td>UH Manoa</td>
<td></td>
<td></td>
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<tr>
<td>UH West Oahu</td>
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<tr>
<td>Hawaii CC</td>
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<td>Honolulu CC</td>
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<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>
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</tr>
</tbody>
</table>

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

   [Signature]

   Joseph E. Clouti

   *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.

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 250: Observational Astronomy
3 credits
Section:
Tuesday & Thursday 3:00 – 4:15 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

An introduction to the tools and techniques of observational astronomy: astronomical time and coordinate systems, photometric systems and magnitudes, principles of telescopes and their operation, introduction to modern astronomical instruments, analysis of astronomical data. Includes planetary, solar and stellar observations.

Prerequisites: ASTR 110; or ASTR 180 and ASTR 181

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

Required Activities at Times Other Than Class Times: none

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 primary functions of an astronomical telescope and major detectors, such as spectrometers and photometers.
3. Apply basic principals in planetary remote sensing and image processing.
4. Outline astronomical techniques involved in observing planetary and stellar objects, such as
variable stars, asteroids and the Sun and Moon.
5. Compare and contrast the research involved in optical, radio, infrared and cosmic ray astronomy.
6. 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 the fundamentals of 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 tests.

There will be 4 QUIZZES (worth 50 points each) and a FINAL EXAM (worth 100 points). All tests are to be taken within the classroom environment; all are closed-book/closed notes. The Final Exam includes all material covered throughout the semester.

All tests are principally objective-type tests with a few short essay-type questions. Tests dates are listed on the course syllabus.
Test dates are listed on the course syllabus. The student is responsible for keeping abreast with any changes in syllabus, which are announced in class. Unless permission is granted by the instructor, all tests must be completed and submitted to the instructor at the specified date and time.

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>
</tbody>
</table>

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 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.

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. If a student is unable to take an exam at the scheduled time, the student is responsible for notifying the instructor of the situation and reason(s). The student is responsible for requesting a make-up exam. An appropriate scoring penalty may be assigned to this make-up at the instructor's discretion. The student may be required to fulfill additional requirements as specified by the instructor in order to qualify for a make-up test. **No more than one make-up test is allowed per student in this course.** Any test not taken will be assigned a score of zero.

2. Retests are not permitted.

3. 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.

4. 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 **NASA Flight Training Aerospace Education Laboratory** (ʻImiloa 112) and **Lanihuli Observatory**.

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 Final Exam grade and/or semester grade in advance of the official report of grades should email a request for the grades to the instructor immediately after the Final Exam. The student may also provide the instructor a stamped, self-addressed postcard or envelope on the day of the Final Exam with an enclosed note requesting the grades.
<table>
<thead>
<tr>
<th>Aug</th>
<th>TUESDAY</th>
<th>THURSDAY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chp 1: Celestial Sphere &amp; Coordinate Systems</td>
<td>Chp 3: Charts &amp; Catalogs</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
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<tr>
<td>Aug/Sep</td>
<td>Chp 2: Time</td>
<td>Chp 6: Optical telescopes</td>
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<tr>
<td>31</td>
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<td>Chp 5: Quantifying light</td>
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<tr>
<td></td>
<td><strong>QUIZ 1</strong></td>
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<td>14</td>
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<tr>
<td></td>
<td><strong>IMAGINARIUM</strong></td>
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<td></td>
<td><em>Two Small Pieces of Glass</em></td>
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<tr>
<td>21</td>
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<td>Chp 9: CCD</td>
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<tr>
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<td>Chp 7 Effects of Atmosphere</td>
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<td>28</td>
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<td>Chp 10: Astronomical Photometry (magnitude systems)</td>
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<td><strong>QUIZ 2</strong></td>
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<td>Remote Sensing: Planetary Astronomy</td>
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<tr>
<td>Date</td>
<td>TUESDAY</td>
<td>THURSDAY</td>
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<tr>
<td><strong>Oct</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>IMAGINARIUM</td>
<td>Chp 11: Astrometry</td>
</tr>
<tr>
<td></td>
<td><em>Far Out Space Places</em></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Chp 12: Astronomical</td>
<td>Chp 13: Astronomical</td>
</tr>
<tr>
<td></td>
<td>spectrographs</td>
<td>spectroscopy</td>
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<tr>
<td><strong>Nov</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Election Day</td>
<td>4</td>
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<tr>
<td>9</td>
<td>QUIZ 3</td>
<td>11</td>
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<tr>
<td></td>
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<td>Veterans Day</td>
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<tr>
<td>16</td>
<td>Chp 14: Variable Stars</td>
<td>18</td>
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<tr>
<td>23</td>
<td>Chp 15: Solar Astronomy</td>
<td>25</td>
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<tr>
<td><strong>Nov/Dec</strong></td>
<td></td>
<td>THANKSGIVING</td>
</tr>
<tr>
<td>30</td>
<td>IMAGINARIUM</td>
<td>2</td>
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<tr>
<td></td>
<td><em>Heart of the Sun</em></td>
<td>QUIZ 4</td>
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<tr>
<td></td>
<td>Radio &amp; Cosmic Ray</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Astronomy</td>
<td>Review</td>
</tr>
</tbody>
</table>

**TUES, Dec 14 FINAL EXAM**  3:00-4:50pm