

## **ASTR 299: Archaeoastronomy & Navigation**

**4 credits (WI)**

by arrangement

**INSTRUCTOR:** Joseph Ciotti  
**OFFICE:** 'Imiloa 134  
**OFFICE HOURS:** posted on office door  
**TELEPHONE:** 236-9111  
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**EFFECTIVE DATE:** Spring 2005

### **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 archaeoastronomy with a survey of astronomical structures in Meso-American, Great Britain and Africa as well as navigational techniques of Micronesia and Polynesia. Student will visit selected Hawaiian sites on O'ahu to measure astronomical orientations and produce both panoramic and AllSky images. The student will also write weekly review/research reports on selected topics in archaeoastronomy. (Writing Intensive course.)

**Pre-requisites:** ASTR 110 and IS 160; credit or concurrent enrollment in IS 260

**Activities Required at Scheduled Times Other Than Class Times** N/A

### **GOALS**

The goals of the course are:

1. To provide the student with an in-depth understanding of the astronomical orientation and significance of ancient structures.
2. To provide the student with basic scientific techniques for measuring astronomical orientations at archaeological sites.
3. To provide the student with the skills utilized in wayfinding both over land and across the ocean.
4. To cultivate and enhance the student's ability to reason by applying the scientific method.
5. To promote greater student appreciation and awareness of the role of astronomy in ancient cultures.

## STUDENT LEARNING OUTCOMES

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

1. understand and apply the principles of astronomy to the layout of ancient astronomical structures.
2. apply the skills in Polynesian wayfinding.
3. discuss the cultural aspects of ancient monuments and relate them to astronomical phenomena.
4. apply photographic techniques required in calibrating and creating panoramic and AllSky images of archaeologically significant structures and landmarks.
5. apply image analysis software designed for analyzing and displaying panoramic and AllSky photographs.
6. develop writing skills appropriate to research papers and journals.

## 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 written research/review reports, journal, photographic assignments and mentor evaluation. In addition, an assessment will be made weekly on the literary content and style of weekly reports. The student will write 2-3 page research paper on a selected topic in archaeoastronomy each week. In addition, the student will be required to photograph, digitally analyze and produce at least two panoramic/AllSky images of astronomical sites on O‘ahu.

The points are allotted as follows:

Research/review papers	120
Photographic projects	60
Journal/log of field work	10
Mentor evaluation	50
Writing Intensive evaluation	<u>120</u>
<b>Total points</b>	<b>360</b>

## Grading System

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

### Letter Grade   Definition

- |          |  |   |
|----------|--|---|
| <b>A</b> | 90% - 100% of cumulative points possible   | (excellent achievement)                 |
| <b>B</b> | 80% - 89% of cumulative points possible  | (above average achievement)             |
| <b>C</b> | 70% - 79% of cumulative points possible  | (average achievement)                   |
| <b>D</b> | 60% - 69% of cumulative points possible  | (minimal passing achievement)           |
| <b>F</b> | below 60% of cumulative points possible  | (less than minimal passing achievement) |
| <b>I</b> | 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.*

- |           |   |  |
|-----------|---|--|
| <b>CR</b> | Achievement of objectives of course at the C level or higher. (course credit awarded)   |  |
| <b>NC</b> | Used to denote achievement of objectives of the course at less than C level under CR/NC option. (no course credit awarded)  |  |
| <b>N</b>  | 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) |  |
| <b>W</b>  | 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)   |  |
| <b>L</b>  | Audited Course (no course credit awarded)   |  |

## LEARNING RESOURCES

1. Astronomy and Navigation in Polynesia and Micronesia by Kjel Akerblom
2. Stars over Hawaii by E.H. Bryan, Jr.
3. Polynesian Voyaging Lab Manual (WCC distribution)
4. Stairways to the Stars : Skywatching in Three Great Ancient Cultures by Anthony Aveni
5. Echoes of the Ancient Skies: The Astronomy of Lost Civilizations by E. C. Krupp

## ADDITIONAL INFORMATION

1. 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](mailto:lemke@hawaii.edu), or you may stop by Hale 'Akoakoa 213 for more information.
2. Students are encouraged to visit WCC's **Aerospace Exploration Lab** (located in Hale 'Imiloa 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** ('Imiloa 112) and **Lanihuli Observatory**.
3. 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.
4. 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. The student may also provide the instructor a stamped, self-addressed postcard or envelope with an enclosed note requesting the grades.