

ASTR 299: Atmospheric Physics
1 credit

Internship at NOAA's Fluid Modeling Facility (North Carolina)

INSTRUCTOR: Joseph Ciotti
OFFICE: 'Imiloa 134
OFFICE HOURS: posted on office door
TELEPHONE: 236-9111
EMAIL: ciotti@hawaii.edu
EFFECTIVE DATE: Summer 2007

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 into atmospheric physics and fluid dynamics. Topics include applications to earth environmental studies and planetary atmospheres. This course includes an 8-week internship at NOAA's Fluid Modeling Facility (FMF) in North Carolina. This summer study project will evaluate models for various types of pollutant dispersion around natural and manmade obstacles. Research work involves the integration and calibration of a high-resolution hydrocarbon detector at the FMF's wind tunnel. The goal of this internship is to develop a more advanced method for detecting the dispersion of hydrocarbons over and around topographical features by sampling the instantaneous change in hydrocarbons at a specific site. The method currently in use takes only the average change at a specific location. Instrumentation relies on the principal of flame ionization. By placing the sampling unit closer to the source a better sample can be taken. It will be necessary to clean, troubleshoot, test, calibrate and retest the system. A presentation of this project will be made at the HSGC fall symposium for undergraduate research.

Pre-requisites: ASTR 281

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

GOALS

The goals of the course are:

1. To provide the student with a more in-depth understanding of atmospheric dynamics.
2. To provide the student with basic scientific techniques for measuring atmospheric fluid and dispersion, including hands-on experience with research-grade wind tunnels, convection tanks and laser optical measurement devices.
3. To provide the student will the skills utilized modeling of fluid flow.
4. To promote greater student appreciation and awareness of careers in atmospheric physics and planetary astronomy.

STUDENT LEARNING OUTCOMES

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

1. understand and apply the fundamental principles of atmospheric physics.
2. apply the skills in fluid modeling with research-grade equipment, such as wind tunnel and laser optical devices.
3. identify and evaluate models for various types of pollutant dispersion around natural and manmade obstacles.
4. apply modeling techniques learned to planetary atmospheres.
5. identify career paths in atmospheric physics and planetary astronomy.

ASSESSMENT TASKS AND GRADING

Method of Evaluation

Evaluation of the successful completion of the objectives of this course will be determined by completion of internship work at NOAA's FMF (20 pts per week) as verified by NOAA representative. The student will consult at least once a week with the WCC instructor and received (5 pts per week). The student will develop a PowerPoint presentation of the research engaged in during the internship at NOAA's FMF. [Note: It is anticipated that the student will present this PowerPoint presentation at the all 2007 HSGC Fellowship Symposium.]

The points are allotted as follows:

| | |
|--------------------------------------------|------------|
| Completion of Internship at NOAA's FMF | 160 |
| Consultation with Instructor | 40 |
| PowerPoint Presentation of Internship Work | <u>50</u> |
| Total points | 250 |

Grading System

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

Letter Grade Definition

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

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| 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

- An Introduction to the Solar System (edited by Neil McBride and Iain Gilmour)
- Earth from Above (Claire Parkinson)
- Other resource as provided by NOAA's FMF

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, or you may stop by Hale 'Akoakoa 213 for more information.
2. 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.
3. 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.