

ASTR 110 INTRODUCTION TO ASTRONOMY

3 Credits

Asynchronous Online Course – Check in Daily

INSTRUCTOR: Sean P. Moroney, Ph.D.
OFFICE: Imiloa 118
OFFICE HOURS: Fri – 11:00 AM – 12:00 PM
BlackBoard Collaborate – to be scheduled
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EFFECTIVE DATE: Spring 2016

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

Windward Community College offers innovative programs in the arts and sciences and opportunities to gain knowledge and understanding of Hawai'i and its unique heritage. With a special commitment to support the access and educational needs of Native Hawaiians, we provide O'ahu's Ko'olau region and beyond with liberal arts, career and lifelong learning in a supportive and challenging environment — inspiring students to excellence.

CATALOG DESCRIPTION

Introduction to the astronomical universe for non-science majors.

Activities Required at Scheduled Times Other Than Class Times

No additional activities

STUDENT LEARNING OUTCOMES

The student learning outcomes for the course are:

1. Outline the development of astronomy from ancient times to present and explain the role of the scientific method in this historical context.
2. Describe and explain the apparent motions of the celestial bodies, especially as related to naked-eye observations.
3. Identify the appropriate instruments used by astronomers to understand the universe.
4. Outline the origins of our solar system and appraise the leading cosmological theories of the origin of the universe.
5. Describe the physical and chemical properties of the objects in our solar system and apply the concept of comparative planetology.
6. Describe the physical and chemical nature of stars, and especially our sun, and apply the astronomical techniques used to measure stellar properties.
7. Outline the evolutionary stages in a star's life and compare and contrast the structure of our Milky Way and other galaxies.
8. Apply astronomical concepts to the search for extraterrestrial life.

COURSE MODULES

The course is structurally divided into 5 Modules:

Module 1: Here we cover the basics. These include the appearance of the universe from a moving platform (Earth) within the solar system and the basic principles of physics necessary to understand how the universe works. These principles include the laws of motion, gravitation, electromagnetic radiation, and atomic structure.

Module 2: The origin of the solar system is discussed. Then we conduct a survey of the planets, their moons, and the other bodies orbiting the sun.

Module 3: We then consider the sun and its properties. The nature and the variety of stars is discussed. The H-R Diagram is introduced both as a tool for cataloging star types and as a way of displaying their evolutionary development. The end-stages of low- and high-mass stars (white dwarfs, neutron stars, and black holes) are discussed.

Module 4: The Milky Way Galaxy is explored. Then, the various types of galaxies at great distances are reviewed. The cosmology of the Big Bang, along with the current topics of dark matter and dark energy, are reviewed.

Module 5: Finally, the frontiers of current astronomical discoveries are discussed. These topics here include the discovery of many varieties of exoplanets and the search for extraterrestrial life.

COURSE TASKS

The course tasks described here rely considerably upon active involvement and participation by all course members. Details on all these course tasks will be supplied separately.

- **Group Discussions:**
Every couple of weeks, a question from the current course material will be selected; each student will then develop individual answers for the question. The students will then be assigned to weekly Groups whose function will be to synthesize the Group members' answers into a more complete document. The Groups will then collaborate with the other Groups to prepare a Class response to the questions. This document will be posted in Lulima as a Study Guide. There will be seven (7) such Discussions during the term.
- **MasteringAstronomy HomeWorks:**
These HomeWorks will be accessed from the www.masteringastronomy.com website. The HomeWorks are aligned by Chapter in the text. The Homeworks will be available continuously for fixed intervals that follow the Module schedule given in the Calendar.
- **Group Projects:**
In each Module, Teams composed of randomly selected class members will explore specific assigned topics and will prepare presentations to be posted onto the course site in Lulima. There will be three (3) Projects during the term.
- **Chapter Content Questions:**
Each Section of each Chapter has a narrated PowerPoint Lecture in the Lulima course site. Embedded in each of these Lectures are Review Questions that must be answered during the time of each associated Module.
- **Ask the Professor:**
On a roughly biweekly basis, in a forum set up for this purpose, each student will pose a question on a specific topic, which the Instructor will then explore in some detail. Thought-provoking questions on the current subjects are requested.

- **Ask the Student:**
On a biweekly basis, in a forum set up for this purpose, the instructor will pose, for each student, a question on a current topic in the course. The student will then explore the topic in some detail and will post a response. The answers will be shared with the class.
- **Tests:**
Five (5) Tests, taken online through Lualima, will take place at approximately 3-week intervals. Each Test will cover one of the Modules of the course.

GRADING OF COURSE TASKS

The course grade will be computed as follows:

	Number	Max. Score
Group Discussions	Best 6 of 7	10%
Group Projects	3	30%
MA HomeWorks	Best 15 of 19	15%
Course Content Qs	# of Sections	10%
Ask the Professor	10	10%
Ask the Student	Best 6 of 7	10%
Module Tests	Best 4 of 5	15%
	Total =	100%

(MA = MasteringAstronomy; Qs = Questions)

Course work submitted after specified Due Dates will be subject to a Lateness Deduction, which will generally be 10% per calendar week late after the Due Date. The lateness may be excused for a valid documented reason.

GRADING SCALE

The final letter grade will be based on the total percentage that the student has earned from all the course tasks. Each letter grade and its respective level of achievement is provided in the following table:

Letter Grade	Definition
A	90% - 100% of cumulative points possible
B	80% - 89.9% of cumulative points possible
C	70% - 79.9% of cumulative points possible
D	60% - 69.9% of cumulative points possible
F	below 60% of cumulative points possible

Other grades may be assigned as listed in the WCC Catalog.

LEARNING RESOURCES

Textbook:

The Essential Cosmic Perspective Plus MasteringAstronomy with eText – Access Card Package, 7th ed. by Bennett, Donahue, Schneider, and Voit. Pearson Education, Inc. ISBN = 9780321927842

Website:

www.masteringastronomy.com: Pearson Education's Astronomy website, replete with animations, videos, and eText. This will also house the Quizzes for the course, permitting their completion according to the student's own schedule.

ATTENDANCE

Checking in regularly and interacting with the Instructor and the class is expected. It will be important to observe the Due Dates for the course. A steady progress forward will get us all successfully to the goal.

DISABILITIES ACCOMMODATION STATEMENT

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

Revised May 25, 2011

COURSE CALENDAR

ASTR 110 OL - Spring 2016

<u>Week</u>	<u>Date</u>	<u>Module</u>	<u>Topics</u>
1	11 - 17 Jan		Course Introduction
2	18 - 24 Jan	1 - Basics	Chs. 1 - 5
3	25 - 31 Jan		
4	1 - 7 Feb		
5	8 - 14 Feb	2 - Solar System	Chs. 6 - 9
6	15 - 21 Feb		
7	22 - 28 Feb		
8	29 Feb - 6 Mar	3 - Sun and Stars	Chs. 11 - 14
9	7 - 13 Mar		
10	14 - 20 Mar		
11	28 Mar - 3 Apr	4 - Galaxies and Origins	Chs. 15 - 18
12	4 - 10 Apr		
13	11 - 17 Apr		
14	18 - 24 Apr	5- Worlds and Life	Chs. 10 & 19
15	25 Apr - 1 May		
16	2 - 8 May	Summation	