

COURSE OUTLINE

ASTR-104

Elementary Astronomy

3 Credits

Science Core Course

HOWARD COMMUNITY COLLEGE

Description

Elementary Astronomy is a one-semester elementary course in descriptive astronomy, especially appropriate for non-science students. The student will become knowledgeable in the areas of historical astronomy, basic tools and methods of astronomy, earth and celestial body motions, characteristics of the sun and its planets, composition and evolution of stars, nature and distribution of galactic systems, role of the space program, and the possibility of life in the universe. For astronomy lab, see ASTR-114. Prerequisite: Eligible to enroll in MATH-070. (3 hours weekly)

Statement on General Education and Liberal Learning

A liberal education prepares students to lead ethical, productive, and creative lives and to understand how the pursuit of lifelong learning and critical thinking fosters good citizenship. General education courses form the core of a liberal education within the higher education curriculum and provide a coherent intellectual experience for all students by introducing the fundamental concepts and methods of inquiry in the areas of mathematics, the physical and natural sciences, the social sciences, the arts and the humanities, and composition. This course is part of the general education core experience at Howard Community College.

Overall Course Objectives

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

1. Identify and address their alternate concepts (misconceptions) in astronomy.
2. Write a critique of a contemporary astronomy article (written for the layman) related to a topic studied in this course.
3. Demonstrate a general understanding of contemporary theories of the structure, distribution, features and evolution of the solar system and its planets, stars and galactic systems (if time permits).
4. Apply basic astronomy principles to explain practical astronomy applications.
5. Interpret astronomical facts and principles.
6. Apply astronomy principles to solve simple problems.
7. Intelligently discuss contemporary topics in astronomy such as Life in the Universe, U.S. Space Program, etc., found in newspaper and magazine articles (TV shows like NOVA) which deal with astronomy.
8. Identify basic operational principles of the primary types of light telescopes.
9. Develop a sense of the size of things in astronomy as well as distances (e.g. between planets, between stars, etc.).

Major Topics

- I. Overview of Astronomy
 - A. Motions in the Sky, Stellar Location and Celestial Coordinate Systems
 - B. Historical Astronomy-Babylonians Through Newton and Einstein
 - C. Basic Terminology and Mathematical Measurement Techniques for Astronomy
 - D. Basic Light Concepts As Applied to Astronomy, e.g., Light Properties, Spectroscopy, etc.
 - E. Telescopes and Their Use in Visible and Invisible Astronomy
 - F. Non-Telescope Astronomical Observations, e.g., Lunar Phases, Eclipses, Occultations, etc.

- II. Solar System
 - A. Earth-Moon System
 - B. Planetary Overview and Earth Features
 - C. Evolution and Characteristics of the Terrestrial Planets (and Moons)
 - D. Evolution and characteristics of the Jovian Planets (and Moons)
 - E. Solar System Debris, e.g. Asteroids, Comets, Meteors and Meteorites plus its Formation
 - F. Characteristics of the Sun and Solar Features plus Related Phenomena

- III. Stars and Galaxies
 - A. Magnitude, Distances, Motions, Spectra and Classification of the Stars
 - B. Stellar Types, Composition, and Evolution of Stars
 - C. Galaxies and Interstellar Medium (possibly)
 - D. Active Galaxies Cosmology - The Origin, Structure, and Evolution of the Universe (possibly)
 - E. Life in the Universe (possibly)

Course Requirements

Grading/exams: Grading procedures will be determined by the individual faculty member, but will be calculated on the basis of homework and exams. This course will include a final comprehensive exam.

Writing: Specific writing assignments will be determined by the individual faculty members, but will include a critique and written homework and exam assignments.

Other Course Information

This course is a Science core course, a Science elective and an Arts and Sciences elective. ASTR-104 and ASTR-114 (a laboratory) will fulfill the laboratory science requirement for transfer to most four-year schools.