

Virginia Western Community College

NAS 131

Astronomy I

Prerequisites

A placement recommendation for ENG 111, co-enrollment in EDE113/ENG 111, or successful completion of all developmental English requirements.

Course Description

Introduces astronomy of the solar system, including the Sun, planets, their satellites, and other solar system objects. Includes discussions of the development of astronomy through the ages, recent discoveries, and experience with the types of mathematical exercises and observational skills essential for an understanding of the fundamental principles of solar system astronomy. Assignments require fluency in arithmetic, unit conversion, basic algebra, geometry, and trigonometry. This course is cross-listed with PHY 141. Credit will not be awarded for both.

Semester Credits: 4

Lecture Hours: 3

Laboratory Hours: 3

Required Materials

A scientific calculator

Textbook:

The Essential Cosmic Perspective. Bennett, Donahue, Schneider and Voit. 9th Edition. Pearson Publishing. ISBN: 9780135794982 or 9780135795033

Course Outcomes

At the completion of this course, the student should be able to:

- Demonstrate improvement in critical thinking by applying the scientific method to fact and theory in classroom learning, activities, and assignments.
- Learn the history of the development of astronomy.
- Understand the differences between the geocentric and heliocentric models of the solar system.
- Understand the motion of celestial bodies.
- Know our cosmic address and the history of the universe.
- Understand the physical laws behind astronomy.
- Learn how our Solar system was formed and organized.
- Understand the difference between a planet and a dwarf planet.
- Describe the internal structure of the planets.
- Explain the difference between a Terrestrial and Jovian planet.
- Learn how it leads to two types of planets, Terrestrial and a Jovian planet.

- Learn the geological history of the Terrestrial planets.
- Explain why Jovian planets have so many moons and rings.
- Understand how extrasolar planet are being discovered.
- Learn how their discovery changes our views of our own Solar System.

Topical Description

PART 1: DEVELOPING PERSPECTIVE

Chapter 1: A Modern View of the Universe

Chapter 2: Discovering the Universe for Yourself

Chapter 3: The Science of Astronomy

PART 2: KEY CONCEPTS FOR ASTRONOMY

Chapter 4: Making Sense of the Universe: Understanding Motion, Energy, and Gravity

Chapter 5: Light: The Cosmic Messenger

PART 3: LEARNING FROM OTHER WORLDS

Chapter 6: Formation of the Solar System

Chapter 7: Earth and the Terrestrial Worlds

Chapter 8: Jovian Planet Systems

Chapter 9: Asteroids, Comets, and Dwarf Planets: Their Nature, Orbits, and Impacts

Chapter 10: Other Planetary Systems: The New Science of Distant Worlds

Notes to Instructors

1. The construction of simple astronomical instruments can be accomplished with a minimum of resources. These can include Astrolabe, Planisphere, Sundial, Solar Viewer, and Spectroscope. Most of these instruments can be taken home by students.
2. Grades from some combination of the following will be used to determine each student's final course grade: Laboratory exercises, class participation, homework assignments, papers, projects, oral presentations, and exams. Exams may be multiple choice, some combination of multiple choice and short answer or essay, or purely essay and/or short answer. A final exam is required and must constitute no less than 25% of the course grade. Individual instructors may determine the relative weightings of the other components in determining the grade for the course and must state the weightings to be used in determining student grades in the course syllabus.

[ADA Statement \(PDF\)](#)

[Title IX Statement \(PDF\)](#)