

# Virginia Western Community College

## NAS 131

### Astronomy I

#### **Prerequisites**

A placement recommendation for ENG 111, co-enrollment in ENF 3/ENG 111, or successful completion of all developmental English requirements.

#### **Course Description**

Studies the major and minor bodies of the solar system, stars and nebulae of the Milky Way, and extragalactic objects. Examines life and death of stars, origin of the universe, history of astronomy, and instruments and techniques of observation. This is an introductory astronomy course that emphasizes concepts rather than mathematics. The course is designed for non-science majors and there are no math prerequisites. The main goal of this course is for students to understand and appreciate the nature of science through the study of astronomy. After completing this class, students will have achieved a basic understand of: scientific method, the structure of scientific revolutions, patterns in the night sky, motion, energy, gravity and light, telescopes, our solar system and properties of planets beyond our solar system. Hands on telescope will be utilized to allow students a real time experience of astronomical observation.

**Semester Credits: 4**

**Lecture Hours: 3**

**Laboratory Hours: 3**

#### **Required Materials**

A scientific calculator

#### **Textbook:**

The Essential Cosmic Perspective. Bennett, Donahue, Schneider and Voit. 8th Edition. Pearson Publishing. ISBN: 9780134459462

#### **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.