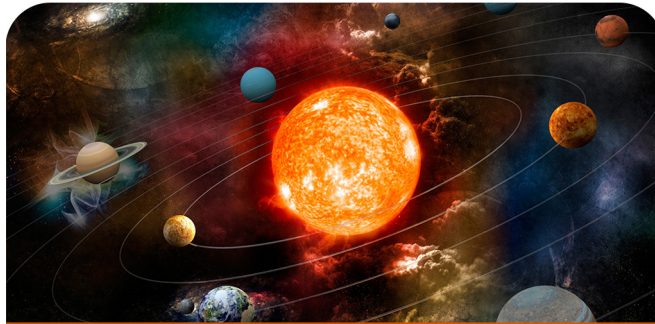




eDynamicLearning

CAREER & ELECTIVE COURSES



STEM

Astronomy 1a

Introduction

Course Syllabus



Astronomy 1a: Introduction

Course Description

This course will introduce students to the study of astronomy, including its history and development, basic scientific laws of motion and gravity, the concepts of modern astronomy, and the methods used by astronomers to learn more about the universe. Additional topics include the origin of the universe, the Milky Way, and other galaxies and stars.

Course Code: EDL132

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Lesson 1: The Earth, Moon, and Sun Systems

Lesson Summary

Day turns into night, and Summer turns into Fall. Why do we experience these predictable changes on Earth? In this introductory unit of Astronomy I, we will explore the systems and interactions between the Sun, Earth, and Moon. You will learn how Earth's motion in space causes us to experience days, nights, and seasons in a cyclic pattern. We will discuss the properties of gravity and how gravity affects the relationships between orbiting bodies in space. You will discover how solar and lunar eclipses occur and examine the characteristics, origin, and phases of the Moon.

Learning Objectives

- Learn about the interactions between the Sun, Earth, and Moon
- Describe how the motion of Earth causes seasons and night-day cycles
- Identify the characteristics and phases of the moon
- Explore how the moon's gravitational pull manipulates tides on Earth
- Distinguish between a lunar eclipse and a solar eclipse



Lesson 2: The Universe

Lesson Summary

In this unit we will take a journey through space and time from the beginning to the end of the universe. Can you think of anything larger or more expansive than the universe? How was the universe created? How is the universe changing? What exactly is our universe made from? These are all questions that scientists have been trying to answer since the idea of a universe was formed in the minds of our earliest cosmologists. Astronomers and other scientists have since accumulated a great deal of knowledge about what has happened—and what is currently happening—since the inception of the universe. Scientists study how the universe is dynamically evolving and its possible demise in the distant future.

In this unit you will explore cosmology, the study of our infinitely expanding home, the universe. You will discover the theory behind how the universe began and how it has evolved, or changed, to become the universe we know today. We will discuss what makes up the matter in our universe and the components and distribution of this matter. Finally, we will examine the possible fates, or even death, of our universe.

Learning Objectives

- Describe the study of the cosmos
- Discuss the theory of the origin of the universe
- Examine the evidence that supports the big bang theory
- Examine the composition of matter and how it is distributed within the universe
- Describe the theories of evolution and fate of the universe



Lesson 3: Stars

Lesson Summary

What are stars? Where did they come from? Will stars evolve with time? In this unit you will discover the secrets behind the stars in our night sky. We will solve the mystery behind why and how stars shine. We will explore the characteristics and composition of stars. You will learn how astronomers classify types of stars using the H-R diagram and how stars are identified within the celestial sphere. Finally, we will examine the evolution, or life cycle, of a star from conception to death.

Learning Objectives

- Describe the composition and characteristics of stars
- Learn how astronomers identify and describe constellations such as Ursa Major, Ursa Minor, Orion, and Cassiopeia
- Analyze and characterize stars by their physical and chemical properties
- Explain the use of diagrams and models in obtaining physical data on stars
- Examine the evolution of stars



Midterm Exam

Learning Objectives

- Review information acquired and mastered from this course up to this point.
- Take a course exam based on material from the first three units in this course (Note: You will be able to open this exam only one time.)



Lesson 4: Galaxies

Lesson Summary

Galaxies are beautiful, majestic, and mysterious places within our universe. Our home in the Milky Way galaxy is a galactic suburb, far from other galaxies. Our Sun is just one of approximately 500 billion stars in our galaxy, meaning that there could possibly be up to 500 billion solar systems, maybe like our own, in the universe. In addition, the Milky Way galaxy is only one of the 50 billion to one trillion galaxies that are thought to exist in our observable universe. Compared with the whole universe, our home, Earth, is like a speck of sand in the largest desert imaginable.

In this unit, we will examine and describe the evolution, organization, distribution, and differences among types of galaxies. You will be able to characterize the movement of galaxies within the universe and describe the properties of our own galaxy, the Milky Way. Finally, we will discover the incredibly mysterious and dark forces that shift and shape galaxies.

Learning Objectives

- Differentiate and describe the types of galaxies within the universe
- Characterize the Milky Way
- Identify how galaxies are organized and distributed within the universe
- Describe the evolution of galaxies
- Examine the forces that shape galaxies of stars



Lesson 5: The Milky Way

Lesson Summary

You have just traveled through the universe, exploring the different galaxies that make up outer space. Now, it's time to return to our own galaxy: the Milky Way. The Milky Way galaxy is what houses the solar system within which our planet Earth resides. Just how old is the Milky Way? And what kind of tools do scientists use to understand our galaxy? It's time to drive a little deeper into our home galaxy of the Milky Way.

Learning Objectives

- Find ways to determine the age of the Milky Way
- Discover the oldest planet located in the Milky Way
- Decipher why there are more younger stars than older stars in the galaxy
- Understand Gaia Mapping and how it is used today



Final Exam

Learning Objectives

- Review information acquired and mastered from this course up to this point.
- Take a course exam based on material from all units in this course. (Note: You will be able to open this exam only one time.)